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Raciocínio clínico dos enfermeiros na
unidade de cuidados pós-anestésicos:
contributos para gerir a incerteza
Lara Daniela Matos Cunha

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contributos para gerir a incerteza**

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Cogitatio

“Quebrar uma noz não é verdadeiramente uma arte, por isso ninguém ousará convocar um público e, para entretê-lo, começar a quebrar nozes diante dele. Mas se apesar disso ele o faz e a sua intenção é bem-sucedida, então não se trata única e exclusivamente de quebrar nozes. Ou então trata-se de quebrar nozes, mas verifica-se que não demos atenção a esta arte porque a dominávamos completamente e que este novo quebrador de nozes mostra a verdadeira essência dela – momento em que poderia até ser útil ao efeito se ele fosse menos hábil em quebrar nozes do que a maioria de nós”

Franz Kafka^(a)

^(a) Kafka, F., & Muir, W. (1997). *Josephine the Singer, Or, The Mouse Folk*. Press Intermezzo.

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RESUMO

Introdução: A incerteza configura-se como um elemento inerente ao raciocínio clínico em contextos dinâmicos e complexos, como a Unidade de Cuidados Pós-anestésicos (UCPA), onde a rapidez e a precisão desse raciocínio são essenciais para a recuperação da pessoa em situação perioperatória.

Objetivo: Contribuir para a compreensão da incerteza no raciocínio clínico dos enfermeiros que trabalham na UCPA.

Métodos: Abordagem multimétodo em cinco etapas: revisão integrativa da literatura sobre a incerteza no raciocínio clínico em contextos clínicos complexos; estudos qualitativos para explorar experiências, moderadores e estratégias de gestão da incerteza dos enfermeiros na UCPA; estudo metodológico para desenvolver o *Post-anesthesia Script Concordance Test*[®] (PaNSCT[®]), com validação de construto e avaliação de confiabilidade, aceitabilidade, adequação e sustentabilidade; mapeamento e consenso de estratégias de suporte ao raciocínio clínico à cabeceira do doente através de *scoping review* e eDelphi modificado; e, ensaio crítico sobre a incerteza no raciocínio clínico com implicações para a prática de enfermagem.

Resultados: Identificaram-se as dimensões pessoal, científica e prática da incerteza no raciocínio clínico dos enfermeiros, bem como dez temas críticos associados à sua experiência: ambiguidade/latitude decisional, comunicação, ética, dificuldade na interpretação/previsão de resultados, compromisso do desempenho cognitivo, incivilidade, indefinição da *core competence* dos enfermeiros da UCPA, cuidados *high-tech*, (in)segurança e risco e stress ocupacional. A gestão da incerteza foi moderada por fatores organizados em intenção, atitudes, normas sociais, contexto e abrange quatro estratégias de gestão: centradas na ignorância, na incerteza, na resposta e na pessoa. O instrumento PaNSCT[®] mostrou-se válido e fiável, distinguindo níveis de experiência clínica e correlacionando-se com o tempo da prática na UCPA. Foram destacadas estratégias normativas e reflexivas no apoio ao raciocínio clínico, com ênfase em abordagens colaborativas e baseadas em evidência, além de desafios como literacia digital, ética e adequação ao contexto. Reforçou-se a importância epistemológica da incerteza, que exige dos enfermeiros consciência crítica, abstração e tolerância moral.

Conclusão: O reconhecimento da incerteza como terreno fértil para a reflexão crítica, criatividade e raciocínio ético, permite aos enfermeiros, com humildade intelectual e abertura à ambiguidade, aplicar estratégias que integram conhecimento técnico com sensibilidade prática e moral.

Palavras-chave: Enfermagem Perioperatória, Período de Recuperação da Anestesia, Incerteza, Raciocínio Clínico

ABSTRACT

Background: Uncertainty is an inherent element of clinical reasoning in dynamic and complex settings, such as the Post-anesthesia Care Unit (PACU), where the speed and accuracy of this reasoning are essential for the recovery of individuals in the perioperative period.

Objective: To contribute to the understanding of uncertainty in the clinical reasoning of nurses working in the PACU.

Methods: A five-phase multimethod approach was used: an integrative literature review on uncertainty in clinical reasoning in complex clinical contexts; qualitative studies exploring the experiences, moderators, and uncertainty management strategies of nurses in the PACU; a methodological study to develop the Post-anesthesia Script Concordance Test® (PaNSCT®), including construct validation and the assessment of reliability, acceptability, appropriateness, and sustainability; mapping and consensus-building on bedside clinical reasoning support strategies through a scoping review and modified eDelphi; and a critical essay on uncertainty in clinical reasoning with implications for nursing practice.

Results: Three dimensions of uncertainty in nurses' clinical reasoning were identified – personal, scientific, and practical – and ten critical themes emerged: ambiguity/decision latitude, communication, ethics, difficulty in interpreting/predicting outcomes, impaired cognitive performance, incivility, vagueness of PACU nurses' core competence, high-tech care, (in)security and risk, and occupational stress. Uncertainty management was moderated by factors organized into intention, attitudes, social norms, and context, and encompassed four types of strategies: ignorance-focused, uncertainty-focused, response-focused, and person-focused. The PaNSCT® instrument proved valid and reliable, distinguishing between clinical experience levels and correlating with time in PACU practice. Normative and reflective strategies were highlighted in supporting clinical reasoning, with an emphasis on collaborative and evidence-based approaches, alongside challenges such as digital literacy, ethical concerns, and contextual appropriateness. The epistemological relevance of uncertainty was reinforced, requiring nurses to engage in critical awareness, abstraction, and moral tolerance.

Conclusion: Recognizing uncertainty as fertile ground for critical reflection, creativity, and ethical reasoning enables nurses, with intellectual humility and openness to ambiguity, to apply strategies that integrate technical knowledge with practical and moral sensitivity.

Keywords: Anesthesia Recovery Period, Perioperative Nursing, Uncertainty, Clinical Reasoning

ÍNDICE DE FIGURAS

Figura 1 – Atributos do RC de enfermagem	28
Figura 2 – Ciclo de raciocínio clínico	30
Figura 3 – Alinhamento entre as etapas da investigação, os objetivos específicos e os estudos realizados.....	50

Abreviaturas e Siglas

CRC – Ciclo de Raciocínio Clínico

TPD – Teoria do Processamento Dual

EMC – Enfermagem Médico Cirúrgica

IA – Inteligência Artificial

IFUM – *Integrative Framework of Uncertainty Management*

TPI – Teoria de Processamento de Informação

MUCH-S – Modelo de Incerteza em Cenários Complexos de Saúde

PaNSCT® – *Post-anesthesia Nursing Script Concordance Test®*

PBE – Prática Baseada em Evidências

PE – Processo de Enfermagem

TP – Teoria Prescritiva

RC – Raciocínio Clínico

TCS – Teoria da Cognição Situada

TS – Teoria dos Scripts

TI – Tolerância à Incerteza

TAR – Teoria da Ação Raciocinada

UCPA – Unidade de Cuidados Pós-anestésicos

UMT – *Uncertainty Management Theory*

ÍNDICE

Nota Prévia	19
Introdução	25
Métodos	47
 CAPÍTULO I – A incerteza no raciocínio clínico dos enfermeiros em contextos complexos de cuidados de saúde: a casuística das Unidades de Cuidados Pós-anestésicos	 53
MANUSCRITO 1: Uncertainty in post-anaesthesia nursing clinical reasoning: An integrative review in the light of the model of uncertainty in complex health care settings	57
 CAPÍTULO II – A experiência dos enfermeiros das Unidades de Cuidados Pós-anestésicos: incerteza no raciocínio clínico, fatores moderadores e estratégias de gestão percecionadas.....	 69
MANUSCRITO 2: “A Certainty for you Does Not Mean That it is a Certainty for Science”: A Phenomenological Analysis of Experiences of Uncertainty in Clinical Reasoning of Nurses in the Postanesthesia Care Unit.....	73
MANUSCRITO 3: Barriers and facilitators to managing uncertainty in nurses’ clinical reasoning in post-anaesthesia care units: a qualitative thematic analysis	85
MANUSCRITO 4: Uncertainty Management Strategies in Clinical Reasoning: Perceptions of Nurses in Post-anesthesia Care Units	95
 CAPÍTULO III – Avaliação do raciocínio clínico sob incerteza dos enfermeiros das Unidades de Cuidados Pós-anestésicos através do <i>Post-anesthesia Nursing Script Concordance Test</i>®	 109
MANUSCRITO 5: Assessing clinical reasoning under uncertainty through the Post-anesthesia Nursing Script Concordance Test: a multi-method methodological study	112

CAPÍTULO IV – Estratégias para a Gestão da Incerteza no Raciocínio Clínico dos Enfermeiros das Unidade de Cuidados Pós-anestésicos: Mapeamento e Consenso de Peritos para Adequação ao Contexto	127
MANUSCRITO 6: Decision support strategies for bedside nursing clinical reasoning: A scoping review protocol	130
MANUSCRITO 7: Decision support strategies for bedside nursing clinical reasoning: a scoping review	140
MANUSCRITO 8: Expert Consensus on Decision Support Strategies for Bedside Nursing Clinical Reasoning in Post-anesthesia Care: a modified eDelphi Study.....	156
 CAPÍTULO V – O conhecido desconhecido: aprofundar a compreensão da incerteza no raciocínio clínico na prática de enfermagem	219
MANUSCRITO 9: Unravelling Uncertainty Inception: When We Really Know That We Don't Know?	222
 Discussão	233
Conclusões	241
Referências Bibliográficas	249
 ANEXOS	261
ANEXO I	263
ANEXO II	265
ANEXO III	266
ANEXO IV	272
ANEXO V	274
ANEXO VI	276
ANEXO VII	280
ANEXO VIII	282

Nota Prévia

A tese procura expor, de forma estruturada e metódica, os resultados da investigação desenvolvida no âmbito do Doutoramento em Ciências de Enfermagem, com enfoque no domínio da Enfermagem Perioperatória, no período pós-anestésico. A sua elaboração resulta, em primeiro lugar, de um projeto previamente concebido e aprovado em provas públicas e, em segundo lugar, da concretização progressiva desse projeto através de distintas, mas sequenciais, etapas de investigação.

A Introdução, aborda de forma sistemática e fundamentada, os conceitos centrais do raciocínio clínico (RC), da incerteza (associada aos cuidados de saúde), da enfermagem perioperatória e do cuidado pós-anestésico. Apresenta, ainda, uma delimitação teórica e conceptual rigorosa, que orienta o enquadramento da tese no âmbito da literatura existente. A partir da revisão crítica do estado da arte, delimita-se o problema que justifica o estudo.

Seguidamente, faz-se uma breve apresentação dos Métodos utilizados nos diferentes estudos e das questões éticas associadas - autorizações dos comités de ética, minutas de consentimento informado - desenvolvidos para operacionalizar a investigação. A informação detalhada pode ser consultada no corpo de cada manuscrito incluído nesta tese.

O desenvolvimento do trabalho empírico encontra-se estruturado em cinco etapas, traduzidas em cinco capítulos, que integram nove estudos. Destes, seis constituem estudos empíricos originais, um estudo corresponde a revisão integrativa, os outros dois ao protocolo da revisão *scoping* e ao respetivo relatório de revisão. Todos os estudos apresentam o manuscrito correspondente, os quais foram publicados ou submetidos a revistas internacionais indexadas, providas de fator de impacto. Dos nove manuscritos, um encontra-se em fase de revisão por pares. Em virtude das restrições temporais impostas pelo prazo de submissão da tese, não foi possível aguardar a publicação deste antes da entrega, conforme desejado. No início de cada capítulo faz-se referência à disseminação resultante dos estudos desenvolvidos em cada um deles.

No Capítulo I destaca-se a publicação do Manuscrito 1 - *Uncertainty in post-anaesthesia nursing clinical reasoning: An integrative review in the light of the model of uncertainty in complex health care settings*.

O Capítulo II dá corpo a uma investigação empírica qualitativa que explorou, em profundidade, a experiência vivida de incerteza no RC por enfermeiros que realizam a sua prática clínica nas UCPAs. Os resultados são apresentados em três manuscritos distintos no capítulo: Manuscrito 2 – *“A Certainty for you Does Not Mean That it is a Certainty for Science”: A Phenomenological Analysis of Experiences of Uncertainty in Clinical Reasoning of Nurses in the Postanesthesia Care Unit*; Manuscrito 3 – *Barriers and facilitators to managing uncertainty in nurses’ clinical reasoning in post-anaesthesia care units: a qualitative thematic analysis*; Manuscrito 4 – *Uncertainty Management Strategies in Clinical Reasoning: Perceptions of Nurses in Post-anesthesia Care Units*.

O Capítulo III apresenta uma vertente quantitativa da investigação, através da validação do *Post-anesthesia Nursing Script Concordance Test*®, uma ferramenta desenvolvida para avaliar o RC sob incerteza em cenários clínicos criados com base em situações reais. Esta etapa metodológica permitiu aferir o desempenho dos enfermeiros em situações ambíguas, aproximando a investigação da prática real e sustentando o rigor da análise com dados empíricos mensuráveis. Concretiza-se no Manuscrito 5 - *Assessing clinical reasoning under uncertainty through the Post-anesthesia Nursing Script Concordance Test: a multi-method methodological study*.

No Capítulo IV, a investigação avança para a identificação, mapeamento e validação de estratégias de apoio ao RC dos enfermeiros à cabeceira do doente, que combina uma *scoping review* com um processo de consenso entre peritos via eDelphi modificado, visando aferir a adequação contextual dessas estratégias à prática clínica perioperatória, especificamente pós-anestésica. Este capítulo integra três manuscritos: o manuscrito 6, intitulado *Decision support strategies for bedside nursing clinical reasoning: A scoping review protocol*; o manuscrito 7, *Decision support strategies for bedside nursing clinical reasoning: a scoping review*; e o manuscrito 8, *Expert Consensus on Decision Support Strategies for Bedside Nursing Clinical Reasoning in Post-Anesthesia Care: a modified eDelphi Study*.

Por fim, o Capítulo V dedica-se a um ensaio crítico sobre a incerteza no RC, que problematiza a sua origem, inevitabilidade e o papel estruturante que desempenha na prática da enfermagem. Este capítulo integra um manuscrito de discussão já publicado, transcende a análise empírica para oferecer um olhar mais profundo sobre a relação entre o conhecido e o desconhecido no exercício clínico. O Manuscrito 9: *Unravelling Uncertainty Inception: When We Really Know That We Don’t Know?* sustenta esta reflexão.

A Discussão opera num plano metanalítico, vinculando criticamente os contributos dos diferentes estudos e estabelece articulações críticas entre eles. As conclusões identificam as implicações para a prática clínica e destacam áreas prioritárias para

futuras intervenções e investigação, além de incluir uma dimensão importante de transferibilidade prática e formativa.

As Referências Bibliográficas que encerram esta tese incluem as utilizadas no enquadramento teórico e na metodologia. As fontes utilizadas para fundamentar os temas abordados em cada manuscrito encontram-se listadas no corpo de cada artigo, conforme os critérios editoriais da revista onde foi publicado/submetido.

Importa referir que a presente tese adota uma narrativa bilingue. O português é o idioma principal e prevalente ao longo do documento. No entanto, dado que a tese integra artigos publicados ou em processo de publicação em revistas científicas internacionais, esses são apresentados em inglês, respeitando o formato e as normas editoriais das respetivas publicações.

Introdução

Raciocínio clínico

O termo ‘raciocínio clínico’ (RC) associado à área disciplinar de enfermagem surge na década de 80 como descritor do ‘*processo de encadeamento progressivo*’ cognitivo, mediado por inferências lógicas sequenciais, para a formulação de uma decisão final (Jones, 1988). O modelo descreve o RC como uma espiral ascendente e externa e o processo inicia-se com o primeiro encontro com a pessoa a *cuidar* e o contexto ambiental do cuidado (Higgs, 1995).

O RC pode ser compreendido como a essência que define a experiência do enfermeiro, sendo uma manifestação da competência profunda que se refina ao longo da prática (Fowler, 1997). Transcende a simples aplicação de conhecimentos técnicos, emergindo como um processo reflexivo e dinâmico, que revela a capacidade de tomar decisões fundamentadas no cuidado à pessoa. Mais do que uma prerrogativa dos ‘experientes’, as competências para o RC surgem como ferramentas essenciais de todos os enfermeiros (independentemente da experiência profissional), que orientam a tomada de decisão sobre o cuidado oferecido, sempre com a intenção de promover o bem-estar e a saúde da pessoa cuidada (Fonteyn & Fisher, 1995).

Com base em Simmons (2010), o RC de enfermagem pode ser definido como um processo cognitivo complexo que utiliza estratégias formais e informais para reunir e analisar dados relacionados com a pessoa alvo do cuidado de enfermagem, avaliar a relevância dessas informações e comparar as ações alternativas. O RC é o precursor de uma decisão e de uma ação que envolve tanto o processo (i.e. cognição e metagnição) quanto o produto (i.e. escolha, decisão ou resolução). Segundo Simmons (2010), os moderadores prévios envolvem a percepção cognitiva, o conhecimento tácito ou explícito, a ponderação de alternativas, o sinal de entrada ‘*cue*’, a necessidade percebida de ação, a avaliação de risco, a educação formal e informal, o conhecimento específico disciplinar, a experiência clínica dos enfermeiros, a me-

mória de curto e longo prazo. Os moderadores subsequentes são definidos como as escolhas, a consciência cognitiva de *cues* adicionais, a decisão, a ação implícita, o julgamento e a inferência.

De forma sumária, Simmons (2010) refere que os atributos do RC incluem a análise de dados (interpretação de informações), deliberação (ruminação), heurística (estratégias de pensamento informais), inferência (especulação), metacognição (pensamento reflexivo), lógica (argumentação), cognição (perceção ou consciência), processamento de informação (organização de dados) e intuição (*insight* independente do raciocínio) - Figura 1.

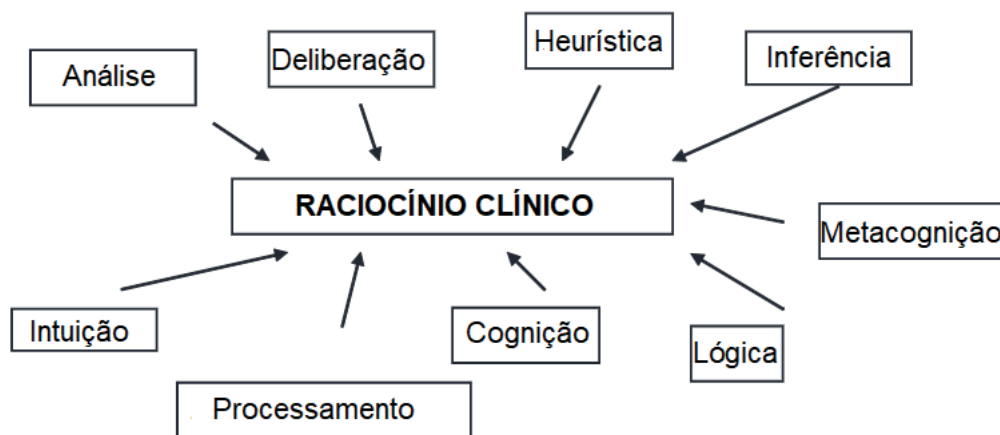


Figura 1 – Atributos do RC de enfermagem.

Fonte: traduzido de Simmons (2010, p.1155)

De maneira análoga, os resultados tornam o processo intencional, recursivo, expansivo e dinâmico.

O RC subsidia “o caminho que os enfermeiros percorrem para agir” através da concretização de todas as fases do Processo de Enfermagem (PE), ou seja, o pensar dos enfermeiros, o seu poder de análise e de decisão para a ação, concretizando-se na multiplicidade dos contextos (Mendonça & Lopes, 2021). Para Meleis (2011), o RC é um conceito *major* no PE pois é, em si mesmo, a operacionalização do próprio processo e é parte integrante do mesmo. Ademais, concretiza-se através da imersão natural nos domínios meta paradigmáticos de Enfermagem: da Pessoa alvo do cuidado de enfermagem como um todo, na Saúde e bem-estar, no Ambiente em que se enquadra, e na ciência e arte do Cuidado de Enfermagem (Fawcett, 2024; Johnson & Carrington, 2023).

O RC torna-se observável na ação através do pensamento crítico, julgamento, tomada de decisão e resolução de problemas, conceitos frequentemente usados para o descrever (Giuffrida et al., 2023; Leoni-Scheiber et al., 2019). Young et al. (2020), identificaram 110 termos distintos associados ao conceito de RC, com reconhecimento de seis categorias principais de terminologia: ‘habilidades’ (capacidades necessárias - i.e.,

habilidades clínicas, habilidades cognitivas, pensamento crítico), ‘desempenho’ (objetivo a ser alcançado - i.e., competência clínica, performance clínica, discernimento ou *expertise*), ‘processo’ (componentes ou meios - i.e., raciocínio analítico, raciocínio indutivo e dedutivo, intuição, heurística, reconhecimento de padrões, metacognição), ‘resultado’ (erros cognitivos, de acordo com os objetivos, qualidade do resultado - i.e., erros de raciocínio, classificação, diagnóstico, acurácia, sucesso diagnóstico), ‘contexto’ (onde o processo ocorre fora da cognição individual, ou fatores influenciadores - i.e., tomada de decisão compartilhada, consciência situacional), ‘propósito’ (focado nos diferentes propósitos ou nos resultados - i.e., justificação diagnóstica, gestão de caso, pensamento diagnóstico).

Os métodos de RC podem ser classificados em três tipos principais: dedutivo, indutivo e abdutivo. O raciocínio dedutivo segue uma abordagem *top-down*, que parte de princípios ou conhecimentos gerais já estabelecidos para aplicá-los a casos específicos, garantindo uma abordagem estruturada e fundamentada na lógica formal. O raciocínio indutivo, por sua vez, adota um caminho *bottom-up*, que se baseia na observação de padrões recorrentes, permitindo a generalização de experiências prévias e evidências clínicas para antecipar diagnósticos ou prever possíveis resultados. Já o raciocínio abdutivo orienta o ‘pensador’ para proposições não tradicionais para explicar um fenômeno, através da exploração de possibilidades e hipóteses inovadoras (Johnson & Webber, 2001).

Levett-Jones et al. (2010) desenvolveu o Ciclo de Raciocínio Clínico (CRC), um diagrama em forma de oito etapas circulares que fornece uma estrutura sistemática para apoiar os enfermeiros na prática diária e influenciar positivamente a prestação do cuidado de enfermagem. É intimamente ligado aos ‘*five rights*’ do RC: a capacidade de colher dados corretos e assumir a ação correta para a pessoa certa, no momento certo e pela razão certa (Levett-Jones et al., 2010).

Com a proposta do CRC, enfatiza-se a identificação da(s) ação(ões) de enfermagem para cada fase do processo de RC e a gestão dos cenários clínicos (Levett-Jones et al., 2017). O CRC inicia-se com a consideração da situação clínica da pessoa a cuidar, colheita de dados/informações, o processamento das informações, a identificação do problema e questões, o estabelecimento de objetivo(s), execução da intervenção, a avaliação dos resultados, a reflexão sobre o processo e a determinação de novas aprendizagens (Levett-Jones et al., 2017). A Figura 2 representa o processo com descritores e *prompts*, elaborados para auxiliar na aplicação prática.

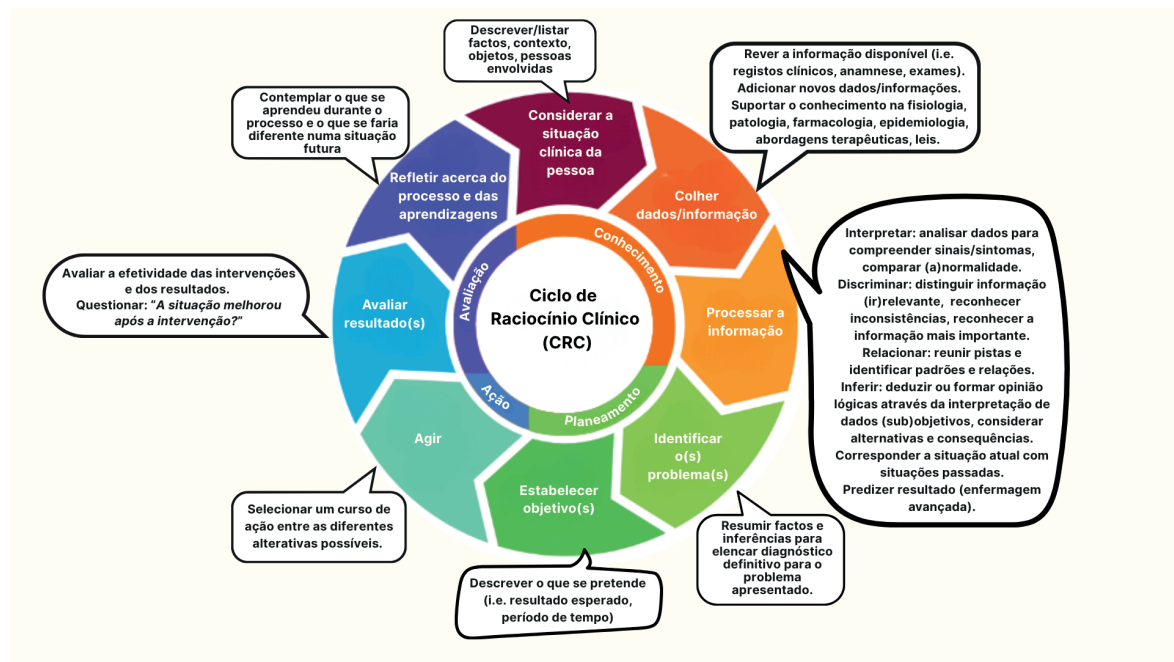


Figura 2 – Ciclo de raciocínio clínico.

Fonte: traduzido de Levett-Jones et al. (2010, p.517)

Ao alicerçar o cuidado de enfermagem com base no CRC, os enfermeiros aprendem a reconhecer e a adequar cada etapa como somatória e necessária, constatando a sua assunção para a prestação de cuidados de enfermagem seguros (Levett-Jones et al., 2017). Pretende-se que seja uma atividade intelectual deliberada, ordenada e estruturada que permita ‘pensar como uma enfermeira’ (Mezirow, 2012). Para ‘pensar como uma enfermeira’, é necessário apreender, não só, o conhecimento factual, conceptual, processual e metacognitivo (Cooper & Frain, 2022) como também, os padrões de conhecimento empírico, estético, pessoal e ético (Carper, 1978). A estes acresce o desenvolvimento das competências (não só) intelectuais para se tornar um pensador disciplinado, autodirigido e crítico, capaz de raciocinar (Paul & Elder, 2006).

O *behaviorismo* foca os comportamentos observáveis, considerando que o RC reflete-se nas ações visíveis no encontro clínico (Chomsky, 1996). Na visão estrita do *behaviorismo*, o processo cognitivo e as emoções não são relevantes para o RC. O processo ocorre mediado por recompensa e punição, ou na observação dos comportamentos recompensados e/ou punidos. Este realça a descrição e previsão da resposta ao estímulo, em detrimento da compreensão do processo cognitivo. Se por um lado, o comportamento é considerado um fator que influencia o processo cognitivo, por outro, as emoções moldam as respostas comportamentais futuras (Chomsky, 1996). Desta forma, objetiva-se a demonstração do comportamento, em detrimento da compreensão processual.

O RC não pode ser observado diretamente, portanto, deve ser inferido a partir de comportamentos observáveis (Rencic et al., 2020). Assim, recorre-se à Teoria da Ação

Raciocinada (TAR), que tem como objetivo prever e compreender o comportamento intencional, focado na crença do indivíduo em relação ao desempenho futuro de um comportamento específico (Fishbein & Ajzen, 1977). O constructo central é a intenção, determinante motivacional do comportamento que reflete até que ponto um indivíduo está propenso a planejar e investir esforços para realizar um determinado comportamento. De acordo com a TRA, a intenção é influenciada por quatro fatores subjetivos: as atitudes em relação ao comportamento, a percepção sobre o que outras pessoas fariam (ou seja, normas sociais descritivas), a percepção sobre o que as pessoas importantes para eles fariam (ou seja, normas sociais injuntivas) e a percepção sobre a disponibilidade de recursos internos e externos necessários para realizar o comportamento (ou seja, controlo comportamental percebido) (Fishbein & Ajzen, 1977).

Portanto, a TAR parece ser relevante para uma análise compreensiva e preditiva do comportamento intencional no contexto clínico, ao considerar como as atitudes, normas sociais e a percepção de controlo influenciam a dimensão comportamental do processo de RC e, conseqüentemente, a execução de ações específicas durante o encontro clínico.

Diferentemente da abordagem *behaviorista*, que se concentra no comportamento observável, a Teoria de Processamento de Informação (TPI) enfatiza os processos mentais, de armazenamento simbólico de informação, para recuperação executiva posterior, em tarefas relacionadas com o RC (Durning et al., 2013). A TPI, engloba outros quadros teóricos como a Teoria dos Scripts (TS) e a Teoria do Processamento Dual (TPD).

De acordo com a TS, o conhecimento é organizado em estruturas cognitivas que permitem o reconhecimento automático de padrões, denominados *scripts* (Custers, 2015). Estes esquemas mentais permitem, não só, a integração de novas informações com o conhecimento existente, como também, reconhecer padrões, interpretar eventos e fazer previsões. A ativação cognitiva dos *scripts* depende de pontos de ancoragem na memória, que foram acionados pelo alinhamento da interpretação dos dados clínicos com as características correspondentes dos *scripts* ativados (Tomkins, 2013). Ou seja, a TS abarca os pontos de vista interpretativo-hermenêutico (humanista) e explanatório-causal (científico), na medida em que contempla a flexibilidade interpretativa do *self-awareness* da pessoa e a estrutura cognitiva processual e desenvolvimental do 'dar sentido' (Tomkins, 1995).

No âmbito dos cuidados de saúde, especialmente na medicina e na enfermagem, a TS destaca a organização do conhecimento como alicerce do RC na relação com a pessoa cuidada. Segundo esta perspetiva, o saber profissional não se apresenta de forma isolada ou fragmentada, mas configura-se em redes cognitivas dinâmicas, denominados 'scripts de doença' (Schank & Abelson, 2013). Os *scripts* têm o propósito de capacitar os profissionais de saúde a irem além da síntese cumulativa de conhecimento, permitindo que estabeleçam novas compreensões a partir da

integração de informações ao seu repertório prévio. Ao comparar continuamente os atributos dos modelos mentais com as características da realidade percebida, os profissionais de saúde ajustam as suas previsões até que um modelo se alinhe suficientemente à cena real, permitindo uma ação coerente (Lubarsky et al., 2015). Dessa forma, tornam-se aptos a captar matizes nos quadros clínicos, a discernir padrões e ruturas, a estabelecer relações entre distintas manifestações clínicas e a antecipar a trajetória provável dos resultados da sua prática (Schank & Abelson, 2013). Assim, o conhecimento clínico revela-se como um tecido vivo, que se expande e se refina constantemente através da experiência, da reflexão e do encontro com o outro (Lubarsky et al., 2015).

O RC é multifacetado e complexo, o que significa que a sua dimensão cognitiva pode abarcar tanto os processos cognitivos, sejam os automáticos/inconscientes quanto os processos conscientes/analíticos (Rencic et al., 2020). O esforço cognitivo exigido para esse processo pode variar desde um rápido e intuitivo reconhecimento de padrões (não analítico) até um raciocínio mais lento e deliberado (analítico) (Neys, 2021). A TPD argumenta que o RC pode ser melhor compreendido através de um modelo que postule dois sistemas de processamento de informação distintos. O sistema 1, de processamento rápido e automático, não recursivo, denominado raciocínio não analítico; e o sistema 2, de processamento controlado, consciente, denominado de raciocínio analítico (De Neys, 2018). O sistema 1 baseia-se em princípios associativos de semelhança e contiguidade espaço-tempo, envolve reduzido esforço cognitivo e é, frequentemente, não intencional. O sistema 2 baseia-se na representação simbólica e aplicação de regras relativamente abstratas, envolve esforço cognitivo, e está sob controlo consciente (Ferreira, 2003). Como descrito por Kahneman (2011) em *Thinking, Fast and Slow*, o processo decisório é moldado por uma complexa interação entre raciocínio indutivo e dedutivo, sendo influenciado tanto pelo conhecimento técnico, como também, pela sabedoria prática e adaptabilidade, considerando o risco e a incerteza no cuidar da pessoa.

O RC é dependente do contexto e específico da área, incorporando o conhecimento da enfermagem dentro de um cenário específico de prática (Mendonça & Lopes, 2021; Rencic et al., 2020). A Teoria da Cognição Situada (TCS) propõe que o conhecimento é inseparável da ação, defendendo que todo saber está imerso em atividades ligadas a contextos sociais, culturais e físicos. O saber existe *in situ*, codeterminado pelo agente e é inseparável do contexto, da atividade, das pessoas, da cultura e da linguagem (Durning & Artino, 2011). Na perspetiva situativa, a cognição transcende a esfera individual, manifestando-se como um fenómeno intersubjetivo, nas contexturas sociais, culturais e materiais que estruturam a experiência humana. O RC, sob essa ótica, não é uma mera aplicação de regras abstratas previamente armazenadas, mas um ato interpretativo, situado e sensível às nuances contextuais que se estendem ao ambiente e aos sistemas nos quais opera (Merkebu et al., 2020). Na prática do cuidado, cada encontro é um ato de interpretação situado, e cada interpretação

carrega em si a marca do contexto em que se dá. Assim, compreender o RC é, antes de tudo, compreender o humano na sua condição mais fundamental: um ser que pensa em relação ao mundo que habita.

Neste sentido, a Teoria Prescritiva (TP) de Wiedenbach pode ser analisada sob a ótica da TCS pois as três dimensões – o propósito central, a prescrição (para o cumprimento do propósito central) e as realidades na situação imediata – evidenciam a influência do contexto na prática clínica. O propósito central representa a essência da enfermagem, no qual a expressão varia conforme o ambiente e as necessidades da pessoa cuidada (Wiedenbach, 1963, 1970). A prescrição, que define as ações voluntárias e involuntárias para alcançar esse propósito, também não ocorre de maneira fixa, pois é ajustada conforme o julgamento clínico, o que foi percebido e compreendido pela mente humana, ou seja, o conhecimento (factual, especulativo e prático) e a inteligência emocional dos enfermeiros (Wiedenbach, 1963, 1970). Conquanto, é nas realidades da situação imediata - que envolvem o agente (o enfermeiro), o recipiente ou pessoa cuidada, os objetivos e resultados desejados, os meios ou atividades, e o enquadramento (humano, ambiental, profissional e organizacional) - que se manifestam os fatores contextuais que orientam o propósito central e moldam a prescrição do enfermeiro (Wiedenbach, 1963, 1970). É nesta dimensão que a convergência entre a TCS e a TP se revela de maneira mais profunda: a prática de enfermagem não se desenvolve no vácuo, mas sim num terreno dinâmico no qual as realidades se entrelaçam, moderam e ressignificam continuamente a prática clínica e o cuidado de enfermagem. Assim, o processo de RC não se limita a ser uma resposta técnica a uma necessidade, mas configura-se como uma ação profundamente situada, cuja essência é continuamente moldada pelas circunstâncias e contextos específicos que lhe dão forma.

É aqui que se estabelece o ponto de ligação para os restantes conceitos integrados nesta tese, nomeadamente a incerteza associada aos cuidados de saúde e o cuidado de enfermagem à pessoa em situação perioperatória no contexto pós-anestésico. A partir da TP de Wiedenbach, que enfoca a identificação e validação das necessidades de ajuda da pessoa cuidada (doente ou não), é possível compreender como a incerteza, um fenómeno intrínseco à prática clínica, pode impactar o cumprimento do propósito de cuidado através das realidades na situação imediata que moderam o RC.

Tendo a TP como âncora para a compreensão do cuidado de enfermagem no contexto pós-anestésico, o enfermeiro desenvolve o cuidado prescritivo com base numa situação desejada e no caminho para alcançá-la. Este é configurado como uma prática reflexiva e orientada a partir de três momentos fundamentais: *i)* apreensão da necessidade de cuidado através da identificação da ‘necessidade de ajuda’, *ii)* ação terapêutica intencional para ‘ministrar a ajuda necessária’ com base na leitura do momento presente e na projeção de um estado desejado, *iii)* validação dialógica e responsiva da supressão da ‘necessidade de ajuda’ para um melhor resultado e con-

sequente melhoria da saúde (Wiedenbach, 1963, 1970). Desta forma, o enfermeiro, para além de cuidar, projeta, interpreta e transforma através do RC.

A incerteza associada aos cuidados de saúde pode limitar a capacidade do enfermeiro para aplicar o RC acurado na sua prática clínica. Assim, *i)* a incerteza deriva de uma combinação de elementos e circunstâncias externas que são introduzidos nas situações que carecem de cuidados de enfermagem. Desta forma, pela sua existência, não só moldam o curso dos eventos e influenciam a facilidade com que o enfermeiro consegue alcançar os resultados desejados, mas também a facilidade com que a pessoa cuidada pode beneficiar das ações ministradas pelo enfermeiro; *ii)* a aceitação da incerteza como parte dinâmica imprevisível e disruptiva do cuidado, como um compromisso adaptativo contínuo, consciente e responsivo às complexidades do contexto clínico; *iii)* a validação desta necessidade aprimora o potencial para aperfeiçoar a prática de enfermagem, refletindo sobre como gerir (lidar) com as realidades em enfermagem, para que os resultados desejados da prática sejam garantidos (Wiedenbach, 1963, 1970). Assim, impõe-se a necessidade de uma reflexão mais profunda sobre a incerteza e a sua implicação nos cuidados de saúde, reconhecendo-a como um elemento inerente à experiência do cuidar e, por conseguinte, ao RC.

Incerteza (associada aos cuidados de saúde)

A conceptualização da incerteza, ainda que parcialmente madura, manifesta-se como uma vivência do profissional na prática clínica (Penrod, 2001). A incerteza associada aos cuidados de saúde iniciou-se como objeto de estudo através de Renée Fox na década de 1950, a partir da publicação do ensaio “Training For Uncertainty”, cujo foco era a formação e socialização dos estudantes de medicina (Fox, 1957). Fox (1957) identificou três tipos de incerteza percecionados pelos estudantes de medicina: a que resulta da ausência de domínio sobre a extensa quantidade de conhecimento médico disponível; a que decorre das limitações intrínsecas ao próprio saber médico; e, por fim, a dificuldade em distinguir o que realmente sabemos e a diferenciação da falta de conhecimento sobre a limitação do próprio conhecimento. A incerteza não era vista como uma característica intrínseca da prática médica, sendo predominantemente entendida como um desafio individual.

A partir da década de 1970, a discussão em torno da incerteza adquiriu maior relevância, impulsionada por ações coordenadas de grupos de bioética, instâncias judiciais e agências governamentais, que passaram a centrar-se nos riscos e nas falibilidades inerentes ao exercício clínico. Foi neste cenário que Fox aprofundou a análise dos dilemas éticos arrostados pelos profissionais de saúde, destacando a tensão entre

o domínio técnico-científico e a incerteza emocional, manifestada no risco de erro, nas falhas de diagnóstico e na indefinição prognóstica (Fox, 1980). Fox contribuiu significativamente para a compreensão da incerteza como um fenômeno socialmente construído, evidenciando as estratégias cognitivas e emocionais utilizadas pelos profissionais, o que favoreceu o desenvolvimento de uma prática clínica mais reflexiva, crítica e eticamente fundamentada (Fox, 1980).

Em 2011, Han et al. definiram a incerteza como um estado epistêmico humano caracterizado pela consciência metacognitiva da ignorância, destacando não apenas a ausência de conhecimento, mas a reflexão ativa sobre os próprios limites do saber. A partir desta definição, os autores desenvolveram uma taxonomia conceptual que sistematiza as diferentes formas de incerteza associada aos cuidados de saúde com base em três dimensões fundamentais e independentes: a fonte, que diz respeito à origem da incerteza; o assunto, que se refere ao conteúdo ou temática em causa; e o lócus, que identifica o agente ou entidade onde a incerteza se manifesta (Han et al., 2011).

A primeira dimensão, a fonte, refere-se aos fenômenos primários que originam a incerteza, nomeadamente a probabilidade, a ambiguidade e a complexidade (Han et al., 2011). A probabilidade, também designada por risco, representa a indeterminação inerente a eventos futuros, que gera incerteza aleatória ou incerteza de primeira ordem. A ambiguidade, por sua vez, corresponde à insuficiência, à falta de fiabilidade ou precisão da informação disponível sobre essas probabilidades, o que resulta numa incerteza epistêmica ou de segunda ordem. Já a complexidade diz respeito a aspetos da informação que dificultam a sua compreensão, como são as relações condicionais, os múltiplos fatores de risco ou as várias alternativas decisórias (Han et al., 2011). A aversão à probabilidade (risco), à ambiguidade e à complexidade, apresenta-se como fenômeno amplamente documentado nos diversos domínios do ciclo de vida, incluindo os cuidados de saúde, sendo o evitamento e a redução da incerteza consideradas necessidades e motivações humanas fundamentais (Blumenthal-Barby & Krieger, 2015; Camerer & Weber, 1992; Duttelle & Inukai, 2015). A segunda dimensão, o assunto, remete para o conteúdo ou situação concreta a que a incerteza se refere, podendo esta incidir sobre questões de natureza científica, prática ou pessoal; nesta última categoria incluem-se dúvidas relacionadas com a identidade, com as relações interpessoais, com valores éticos, com questões sociais ou com preocupações financeiras (Han et al., 2011). Por fim, a terceira dimensão, o lócus, identifica o sujeito onde a incerteza se manifesta - normalmente a pessoa cuidada ou o profissional de saúde -, embora esta dimensão possa ser alargada aos familiares, outros profissionais ou decisores políticos (Han et al., 2011).

A aplicação de modelos analíticos à incerteza - como demonstrado na estrutura de Marchau et al. (2019) - revela que esta pode emergir em múltiplos níveis interdependentes. Inicialmente, destaca-se a incerteza de cenário, relacionada com a dificuldade de prever que desenvolvimentos externos serão relevantes para o desempenho futuro

do sistema e qual será a direção ou magnitude dessas mudanças. Mesmo que tais cenários fossem muito previsíveis, persistiria a incerteza estrutural: dúvidas sobre como o sistema interno responderá aos estímulos externos ou sobre os próprios desenvolvimentos autônomos dentro do sistema. Ademais, os mecanismos causais que sustentam o comportamento sistémico podem ser mal compreendidos, ou ainda, haver hipóteses concorrentes sobre essas causalidades, as quais revelam lacunas epistemológicas. Por fim, existe a incerteza valorativa, em que os próprios resultados esperados e a aceitabilidade são disputados entre os diferentes *stakeholders*, cada um com valores, prioridades e interpretações distintas sobre o que constitui um “bom” resultado. Os desacordos não são estáticos: novos atores podem emergir, as preferências são mutáveis e as interpretações podem reconfigurar-se com o tempo, ampliando a complexidade da avaliação e exigindo abordagens de gestão adaptativa e reflexiva (Marchau et al., 2019).

Apesar da relevância do tema, a incerteza na prática de enfermagem tem sido relativamente pouco explorada sob a perspetiva dos próprios profissionais. Predominantemente, é abordada com o foco centrado na pessoa cuidada. Assim, a evidência disponível tende a privilegiar o impacto da incerteza na experiência da pessoa a vivenciar um processo de doença, deixando a vivência do enfermeiro para segundo plano. Para outros, a incerteza é descrita como um componente cognitivo e emocional, interligado ao *stress*, aos mecanismos de *coping* e à tomada de decisão ética (Fukada, 2018; Hilton, 1994).

Merle Mishel desenvolveu a Teoria da Incerteza na Doença, a qual define incerteza como um estado cognitivo resultante da insuficiência de informações necessárias para a construção de um esquema interpretativo ou para a atribuição de significado a determinada situação ou evento (Mishel, 1990). Sustenta que a gestão eficaz da incerteza é fundamental para a adaptação da pessoa durante o processo de doença, sendo a teoria centrada na forma como se processam cognitivamente os acontecimentos relacionados à doença e se constroem significados a partir dessa experiência (Mishel, 1990).

A estrutura teórica proposta por Mishel (1990) organiza-se em três categorias principais. A primeira refere-se aos antecedentes da incerteza, que engloba a forma, composição e estrutura dos estímulos percebidos, e inclui subcategorias como a dificuldade em gerir os sintomas, a incerteza quanto ao diagnóstico e a complexidade do tratamento. A segunda categoria diz respeito à avaliação cognitiva da incerteza, a qual varia conforme as características individuais e contempla duas subcategorias fundamentais: a percepção da incerteza como ameaça e a manifestação de ansiedade, *stress*, manifestações emocionais e estigma. A terceira categoria abrange as estratégias de abordagem da incerteza, que se desenvolvem através do apoio familiar e social, da intervenção de profissionais de saúde e do suporte entre pares.

A Teoria da Gestão da Incerteza (*Uncertainty Management Theory* – UMT), formulada por Brashers, convida-nos a repensar a incerteza não como um inimigo do conhecimento, mas como uma condição neutra, fluida e potencialmente fértil (Brashers, 2001). Em contraste com abordagens tradicionais, como a Teoria proposta por Mishel - que concebe a incerteza como geradora de ansiedade e, portanto, algo a ser eliminado - a UMT reconhece que a incerteza pode ser desejada, tolerada ou evitada, dependendo da relação que a pessoa estabelece com ela (Babrow et al., 2021). Brashers (2001) refere que a incerteza reside menos na ausência de dados do que na fragilidade da confiança na capacidade preditiva das informações disponíveis. A incerteza não é, portanto, apenas uma lacuna no saber, mas uma experiência vivida - situada, subjetiva e carregada de sentido. As respostas à incerteza não seguem um trilho singular: há quem procure dados com avidez, quem opte por não saber e até quem preserve intencionalmente, a ambiguidade como forma de proteger-se, de manter autonomia ou a conviver com o indizível.

Nessa perspectiva, a incerteza deixa de ser um obstáculo a ser vencido e passa a ser um elemento a ser negociado, com sabedoria e sensibilidade. Em determinadas circunstâncias, preservar o desconhecido pode ser tão adaptativo quanto esclarecê-lo – seja para reduzir o sofrimento, preservar a esperança, proteger a intimidade ou manter abertas as possibilidades do encontro humano (Babrow et al., 2021). Ao propor essa visão, a UMT amplia o horizonte da comunicação interpessoal e da prática em saúde, ao lembrar que nem toda verdade é desejada, nem toda resposta é necessária, e que, por vezes, é na convivência consciente com a incerteza que se encontra o espaço ético da escuta, da escolha e do cuidado (Babrow et al., 2021).

O *Integrative Framework of Uncertainty Management* (IFUM) propõe um caminho reflexivo de gestão da incerteza – um tipo de ética do cuidado com o desconhecido (Han, 2021). O primeiro movimento é o do reconhecimento – uma espécie de diagnóstico ampliado. Antes de qualquer tentativa de resposta, é necessário nomear a incerteza, oferecer-lhe contorno. Isso exige olhar atentamente para a sua origem e natureza e para aqueles em cujas consciências ela habita. Segue-se então o segundo movimento, que é o da avaliação prognóstica – um juízo sobre a (ir)reduzibilidade da incerteza. E questionar se: É passível de dissolução? Pode ser superada pelo tempo, pela investigação ou pela razão? Ou estamos perante um não saber que é constitutivo, que precisa ser aceite como parte da existência? O terceiro movimento é deliberativo e diz respeito ao tratamento da incerteza. Pode procurar dissipar a ignorância como quem acende luz sobre o desconhecido; pode aceitar a incerteza como condição da existência e aprender a habitá-la com lucidez; pode transformar a forma como se responde a ela, cultivando coragem no lugar do medo, flexibilidade no lugar de rigidez; ou, mais profundamente, pode voltar-se à pessoa, reconhecendo que toda a incerteza é vivida por um sujeito singular, e que tratá-la é, antes de tudo, um gesto ético de cuidado com o ser que pergunta, que duvida e que sente. Por

fim, esclarecer os objetivos da incerteza para compreender o modo como se deseja caminhar dentro do terreno instável do não saber (Han, 2021).

Os objetivos normativos da gestão da incerteza podem ser organizados numa hierarquia de dois níveis: um nível inferior, prático e instrumental; e um nível superior, abstrato e moral (Han, 2021). Ao nível proximal e concreto, situam-se os chamados “*objetivos de fazer*” - ou seja, os clínicos de cura e os de palição. Porém, acima destes, encontra-se um objetivo último e transcendente: o desenvolvimento da tolerância à incerteza (TI), compreendida aqui no seu sentido mais profundo – uma capacidade metacognitiva, ética e reflexiva, que não busca eliminar a incerteza, mas habitar o espaço que ela cria, com abertura, discernimento e equilíbrio (Han, 2021).

A TI revela-se como um traço existencial, que modula a forma como cada indivíduo se posiciona perante o desconhecido, o ambíguo e o imprevisível (Hillen et al., 2017; Koerner & Dugas, 2008). A incerteza tem mobilizado respostas cognitivas, emocionais e comportamentais diversas - que vão da resistência à adaptação -, tornando-se foco de ampla investigação científica (Hillen et al., 2017). A hipótese subjacente a essa linha de investigação é a de que a TI configura-se como uma disposição relativamente estável da personalidade, uma espécie de lente através da qual o mundo incerto é percebido, avaliado e gerido (Shaffer & Hendrick, 1974). Diversos estudos empíricos têm oferecido respaldo a essa compreensão, sugerindo que a maneira como toleramos - ou não - a incerteza diz menos sobre o contexto em si e mais sobre a forma como o sujeito habita a sua própria incompletude perante o real (Han, 2021; Hillen et al., 2017; Strout et al., 2018).

A TI, embora frequentemente considerada um traço de personalidade relativamente estável, é também profundamente influenciada pelas circunstâncias. Por isso, é mais adequado entendê-la como uma experiência psíquica bifacetada: um traço (disposição duradoura) e também um estado transitório, refletindo as reações imediatas dos indivíduos perante a consciência da incerteza (Han et al., 2019). Com base nesse entendimento, foi desenvolvido o *Integrative Model of Uncertainty Tolerance* que propõe a TI como o conjunto de respostas psicológicas - cognitivas, emocionais e comportamentais, de natureza positiva ou negativa - provocadas pela percepção consciente da ignorância em relação a aspetos específicos do mundo (Han et al., 2019). A consciência do *não saber* é o ponto de partida que dá origem a um espectro de reações, que só emergem quando o desconhecimento se torna consciente e presente no campo perceptivo da pessoa (Han et al., 2019). A TI configura-se não apenas como uma estratégia de gestão, mas como uma virtude moral fundamental que sustenta a prática clínica, orientando a procura pela ‘cura’ ou pelo ‘alívio’ com humildade, sabedoria prática e profundo respeito pela dignidade humana (Han, 2021).

O Modelo de Incerteza em Cenários Complexos de Saúde (MUCH-S) propõe um arquétipo reflexivo que não apenas reconhece as múltiplas formas de incerteza, mas também enfatiza a sua interconexão intrínseca dentro dos sistemas de saúde

complexos nos quais os profissionais de saúde atuam e na(s) estrutura(s) do cuidado (Pomare et al., 2019b). O RC é entendido como um processo situado, sempre em diálogo com contextos mutáveis. O indivíduo não atua no vazio, mas dentro de redes de sentido - sociais, culturais, normativas - que configuram tanto a percepção quanto a ação. Torna-se, assim, um ato interpretativo, permeado por ambiguidade e responsabilidade moral (Pomare et al., 2019b). Após revisão da taxonomia de Han et al. (2011), o MUCH-S incorporou dimensões até então pouco exploradas, como a incerteza ética, presente em dilemas morais quotidianos, e a incerteza sistêmica, que diz respeito às opacidades estruturais dos próprios sistemas de saúde (Pomare et al., 2019b). Ao incluir também a perspectiva dos profissionais na esfera da incerteza pessoal, o modelo reconhece que cuidar envolve, inevitavelmente, habitar zonas de não saber - e que é nesse território, onde o técnico e o ético se entrelaçam, que o cuidado genuíno se manifesta (Pomare et al., 2019b).

A incerteza associada aos cuidados de saúde não ocorre de forma isolada, mas de maneira complexa e inter-relacionada, onde uma forma de incerteza frequentemente desencadeia outra ou ocorre simultaneamente. A interconectividade e coexistência são, também, características fundamentais dos sistemas de saúde modernos, que são complexos, dinâmicos, constituídos por várias entidades multidimensionais e domínios de atuação. É imperativo aprofundar a compreensão da experiência vivida da incerteza - não apenas como fenómeno cognitivo, mas como uma condição existencial que revela a vulnerabilidade e a abertura constitutiva do ser humano no mundo. Essa vulnerabilidade, quando reconhecida e acolhida, pode tornar-se fonte de escuta, compaixão, prudência clínica e sabedoria prática (Han et al., 2019).

Enfermagem perioperatória e o cuidado pós-anestésico

No âmago do cuidado perioperatório, os enfermeiros atuam no sistema de saúde promovendo a segurança da pessoa (Van Wicklin, 2020). O cuidado transcende a técnica: é um compromisso ético e compassivo com a promoção de respostas fisiológicas e comportamentais que favoreçam a recuperação cirúrgica e anestésica (Van Wicklin, 2020). A enfermagem perioperatória não se define por um local específico, mas pela identidade e atuação dos profissionais que acompanham a pessoa e família em situação perioperatória ao longo de todas as etapas do processo, das quais: as fases dos cuidados pré, peri e pós-anestésicos, e em unidades especializadas de controlo da dor (McNeill et al., 2023).

O período pós-anestésico refere-se ao intervalo entre a conclusão da intervenção cirúrgica e a recuperação completa da pessoa (Nilsson et al., 2020). Conforme definido pelo Regulamento nº 428/2018 – Regulamento das Competências Específicas do

Enfermeiro Especialista em Enfermagem Médico-Cirúrgica (EMC) na área da pessoa em situação perioperatória, a fase pós-anestésica inicia-se quando a pessoa é admitida na Unidade de Cuidados Pós-anestésicos (UCPA) e termina quando existe determinação da recuperação do processo cirúrgico/anestésico (Oliveira, 2023).

A enfermagem perioperatória destaca-se pela complexidade, exigência técnica e, sobretudo, pelo compromisso ético com o cuidado ao ser humano em condição de vulnerabilidade (Cousley et al., 2014). Para evidenciar os domínios do cuidado na prática da enfermagem perioperatória, recorre-se a dois modelos complementares que, em conjunto, oferecem uma base estrutural e compreensiva para o cuidado centrado na pessoa em situação perioperatória: o *Perioperative Patient Focused Model* e o *Perianesthesia Nursing Professional Practice Model* (McNeill et al., 2023; Van Wicklin, 2020). Esses modelos integram os domínios clínicos, estruturais, comportamentais e sistêmicos do cuidado, com foco na segurança, na qualidade, no resultado dos cuidados para a pessoa em situação perioperatória e no desenvolvimento contínuo da prática profissional.

No centro do modelo integrado encontra-se a pessoa, o que traduz o compromisso da enfermagem com um cuidado abrangente, mas individualizado. O enfermeiro perioperatório ou perianestésico assume o papel de “advogado” da pessoa, sobretudo durante o período de anestesia, em que esta se encontra particularmente vulnerável. O envolvimento da família e/ou dos cuidadores como participantes ativos no processo de cuidado reforça a natureza humanizada e centrada na pessoa, que caracteriza a prática profissional (McNeill et al., 2023; Van Wicklin, 2020).

A segurança é um domínio transversal e prioritário em ambos os modelos. No *Perioperative Patient Focused Model*, é definida como a ausência de sinais e sintomas de lesões físicas não relacionadas com os efeitos terapêuticos pretendidos (Van Wicklin, 2020). Já no *Perianesthesia Nursing Professional Practice Model*, é entendida como a base ética e técnica do cuidado, promovida através da vigilância contínua, comunicação efetiva e competência clínica (McNeill et al., 2023). Um exemplo prático é o correto posicionamento cirúrgico para prevenção de lesões por pressão.

As respostas fisiológicas representam a estabilidade e funcionalidade do organismo face ao *stress* cirúrgico e anestésico. Este domínio requer do enfermeiro a capacidade de avaliar e monitorizar parâmetros hemodinâmicos, respiratórios e metabólicos, reconhecendo fatores de risco individuais (como diabetes ou insuficiência vascular) e implementando intervenções para manter a estabilidade clínica. No *Perianesthesia Nursing Professional Practice Model*, essas ações estão embasadas na prática baseada em evidências (PBE) e na competência clínica (McNeill et al., 2023).

O domínio das respostas comportamentais abrange os aspetos psicológicos, sociais, espirituais e educacionais da pessoa e família em relação ao procedimento cirúrgico/anestésico. O cuidado ético, compassivo, culturalmente sensível e livre de preconceitos é um princípio central nos dois modelos. O *Perianesthesia Nursing*

Professional Practice Model reforça a importância da comunicação terapêutica e da educação da pessoa para promover o empoderamento e a gestão da ansiedade no período perioperatório (McNeill et al., 2023).

O domínio sistêmico e estrutural contempla os elementos organizacionais que viabilizam o cuidado seguro e eficaz, incluindo ambiente físico, recursos humanos qualificados, disponibilidade de equipamentos, existência de protocolos de cuidado e de cultura institucional. Enfatiza o papel do enfermeiro como participante ativo na gestão da qualidade, segurança e inovação, contribuindo para a criação de ambientes clínicos sustentáveis e resilientes (McNeill et al., 2023; Van Wicklin, 2020).

Na área perianestésica, a educação clínica está intrinsecamente relacionada com a segurança e com a eficácia do cuidado. Através de programas de orientação por competências, conferências, publicações e atualizações sustentadas em PBE, os enfermeiros mantêm-se atualizados perante as rápidas mudanças tecnológicas e terapêuticas. A aprendizagem contínua é também uma estratégia para o fortalecimento da prática reflexiva e da autonomia profissional (McNeill et al., 2023; Van Wicklin, 2020).

O conceito de inquirição clínica engloba a inovação, a melhoria da qualidade, a investigação e a PBE. Este representa o catalisador para a prática de enfermagem, estimulando uma cultura de questionamento e investigação no ambiente clínico. Newman (1997) concebe o enfermeiro como um agente do cuidado, cuja prática deve estar ancorada numa postura investigativa e reflexiva. Perante a imprevisibilidade inerente ao cuidado, onde a incerteza se manifesta e as tarefas desafiam a rigidez da rotina, torna-se fundamental que o enfermeiro desenvolva estratégias inovadoras e criativas válidas para a sua ‘arte’ (Orem et al., 1995).

Delimitação do problema que justifica o estudo

Sob uma perspetiva abrangente, o RC pode ser apreciado como a integração dinâmica de processos cognitivos e comportamentais, os quais se modificam em função do contexto (situação) e co construído pelos diferentes agentes envolvidos no processo: enfermeiro, pessoa cuidada, demais profissionais de saúde (Durning et al., 2013). Estudos apontam que a dissonância entre o *insight* da pessoa alvo do cuidado de saúde e o *insight* do profissional que o executa, mesmo num processo colaborativo de RC, revela a complexidade inerente à co construção, num campo onde a subjetividade e a ciência se entrelaçam (Humphrys et al., 2020). O uso de doentes virtuais tem sido amplamente adotado como uma ferramenta útil no desenvolvimento do RC, proporcionando um ambiente controlado para a simulação de cenários clínicos complexos. Conquanto, não substituem a complexidade e a imprevisibilidade inerentes à prática

clínica (Alowais et al., 2023; Li et al., 2024). Por outro lado, a inteligência artificial (IA) guia os intervenientes para um RC mais profundo ou apenas simplifica o processo cognitivo, limitando a exploração da complexidade das situações (Masters, 2023)? Embora os estudos empíricos acerca do fenómeno da incerteza na enfermagem se concentrem, principalmente, na experiência da pessoa doente (Langmuir et al., 2023; Mishel, 1981; Skojec et al., 2024), a incerteza associada aos cuidados de saúde vivenciada pelos enfermeiros no contexto clínico ainda é um campo pouco explorado, especialmente no que se refere às suas implicações no processo de RC e na gestão das situações complexas e imprevisíveis que marcam o cuidado de enfermagem.

O RC cumpre o propósito agregador multiprofissional ao abranger uma ampla gama de práticas de compromisso comuns com o estudo, diagnóstico, tratamento e prevenção de doenças e de lesões humanas (Gordon et al., 2022). Mais recentemente, surgiu a dimensão diagnóstica como uma atividade baseada no trabalho em equipa, enfatizando o RC como um esforço colaborativo entre profissionais de saúde, pessoa e família (Graber et al., 2017; National Academies of Sciences & Medicine, 2019). A inter-relação entre suas múltiplas dimensões gera uma dinâmica recursiva, integrativa e generativa, que impulsiona a incorporação sistemática de novos dados e conduz, inevitavelmente, a uma contínua adaptação e redefinição do curso do cuidado de enfermagem (Magalhães, 2020).

A incerteza pode representar uma ameaça real aos objetivos do cuidado, levando a desvios em relação ao esperado. Fazer previsões sob incerteza – seja ela epistémica ou aleatória, tangível ou não –, é um desafio intrínseco ao cuidado de enfermagem (Chicca, 2021). A ‘arte’ da antecipação repousa não apenas na experiência acumulada de situações passadas, mas também na ‘sabedoria’ construída através do conhecimento empírico (Benner et al., 2011; Ramezani-Badr et al., 2009). O cuidado de enfermagem na UCPA ocorre num contexto clínico de elevada complexidade, marcado pela interação dos riscos cirúrgicos e anestésicos, e onde as situações clínicas nem sempre encaixam uma linha causal previsível (Mert, 2023). A imprevisibilidade e a multiplicidade de fatores envolvidos mostram que os eventos não se limitam a uma simples sequência de causa e efeito, mas que coexistem numa rede complexa, onde a incerteza se torna constância no processo de cuidado (Almeida, 2014).

Também faz-se necessária a consideração dos atributos de multiagentes que caracterizam o cenário clínico da UCPA. A multidisciplinaridade assume uma configuração relacional poligonal, sendo fortemente influenciada pelas dinâmicas interpessoais e interdisciplinares entre os profissionais (Gilbert et al., 2017). A diplomacia e a competência colaborativa tornam-se essenciais para atuar nos limites da prática (Ghaferi & Wells, 2021). Nesse cenário, torna-se evidente que os fatores inter/intrapessoais não se restringem ao domínio estritamente científico; pelo contrário, a sua natureza ‘extra-científica’ exerce influência direta sobre o RC, moldando, de maneira subtil e inexorável, o próprio ‘fazer’ científico.

O RC exige que os enfermeiros colham e interpretem dados imperfeitos em tempo real (Chicca, 2021). A precisão do RC está intrinsecamente ligada à qualidade dos resultados para a pessoa cuidada (Gopal et al., 2021). Quando impreciso, o enfermeiro pode não captar os sinais subtis de deterioração iminente ou de falhar na hierarquização das intervenções, comprometendo a possibilidade de resgate (Klenke-Borgmann et al., 2023). O RC não se limita a uma competência técnica; é um exercício contínuo de discernimento e de sensibilidade perante a complexidade inerente ao cuidado (Knight, 1921). Ele relaciona-se adicionalmente com a natureza do enquadramento diagnóstico, nomeadamente o critério normativo, a estrutura temporal e o componente teleológico (Chiffi, 2021).

Quando o RC falha – seja por razões individuais, sociais ou ambientais – pode ocorrer erro diagnóstico. O erro diagnóstico configura-se como uma crise global, cujo impacto pode ser profundamente prejudicial e, em certas circunstâncias, potencialmente devastador para a qualidade do cuidado (Khullar et al., 2015; Newman-Toker et al., 2023). Sob a perspetiva da segurança do cuidado, os erros e vieses de RC foram identificados como uma das principais causas de erros diagnósticos, resultando no aumento da morbilidade e mortalidade, no incremento dos custos de saúde e na diminuição da satisfação tanto dos profissionais de saúde quanto da pessoa cuidada (Durning et al., 2020; National Academies of Sciences & Medicine, 2019). Destaca-se a publicação do relatório histórico do *Institute of Medicine* (IOM) “*To Err Is Human: Building a Safer Health System*”, no qual é sublinhado a persistência transversal do fenómeno nos contextos de cuidados de saúde (Kohn et al., 2000). No relatório de acompanhamento de 2015, o IOM destacou as múltiplas causas dos erros diagnósticos, incluindo o profissional de saúde, a família e o sistema, com enfoque na descrição do processo de RC diagnóstico inteiramente restrito aos processos cognitivos ‘*que ocorrem na mente*’ do profissional de saúde (Balogh et al., 2015).

Uma análise abrangente da incerteza e do RC deve considerar a inferência humana em toda a sua complexidade, independentemente da adesão aos modelos normativos (Ferreira, 2003). Além das heurísticas e dos vieses, alguns erros diagnósticos estão associados à incerteza diagnóstica, a erros de mensuração decorrentes da escassez de evidências (além de questões de validade e utilidade), à falha em considerar todas as possibilidades diagnósticas e às diferentes formas de elicitação das crenças dos especialistas (Chiffi, 2021). A relação dialética entre o conhecido e o desconhecido, os desafios metodológicos e clínicos decorrentes da dependência acrítica de procedimentos e protocolos taxonómicos, – que podem estar baseados em pressupostos equivocados –, o profundo senso de dever moral para com a pessoa cuidada e a necessidade de assumir formas adequadas de raciocinar, revelam a importância de aprimorar o RC e de ‘mitigar’ a incerteza (Chiffi, 2021).

Os efeitos da incerteza, bem documentados em outras áreas da vida, ainda precisam ser plenamente compreendidos no campo da saúde. Questões causais - como diferentes tipos de incerteza (diagnóstica, terapêutica, prognóstica) que afetam di-

ferentes pessoas em contextos distintos - permanecem ainda pouco exploradas. Os fatores individuais (sociodemográficos, emocionais, clínicos), contextuais (ambiente de cuidado) e os relacionais (entre pessoa cuidada e profissional) moldam essas experiências de forma complexa, influenciando e sendo influenciados pelas respostas cognitivas, afetivas e comportamentais (Han et al., 2019).

A integração da incerteza no processo RC pelos enfermeiros gera uma inquietação fundamental: como é possível raciocinar quando os dados são ambíguos e o cenário clínico se mostra incerto? Como os enfermeiros integram a incerteza no processo de RC? De que maneira a incerteza é considerada e gerida no RC, especialmente na era em que a PBE parece sugerir a sua ‘eliminação’? Ademais, a PBE, que se pretende como um farol para a tomada de decisão clínica, pode criar a ilusão de que a incerteza é algo a ser erradicado por meio da objetividade das diretrizes. Mas será mesmo possível ‘eliminar’ a incerteza? Ou, na verdade, a aceitação da incerteza é uma condição necessária para a verdadeira excelência clínica? A tensão entre a busca por certeza e a necessidade de lidar com a imprevisibilidade (ou será constância?) da incerteza é um terreno fértil para o crescimento e a reflexão crítica dos enfermeiros.

A análise da incerteza associada aos cuidados de saúde, legitimando-se os benefícios que pode trazer em determinados cenários clínicos, não deve ser encarada como uma panaceia. Contudo, ao expandirmos a compreensão da incerteza, abre-se um espaço para que seja reconhecida como uma parte intrínseca e natural do processo de RC, pois, em essência, é indissociável. Tal expansão, embora parcial e jamais alcançando uma totalidade plena, possibilita que o RC se torne mais consciente e, por consequência, mais enriquecido, permitindo uma prática que acolhe a complexidade e a imprevisibilidade da experiência humana, enquanto busca, de maneira contínua, a construção de sentido e cuidado. Não se trata, portanto, apenas de um problema empírico, mas de uma questão teórica que se desdobra a partir de inquietações clínicas, profissionais, epistemológicas e, sobretudo, ontológicas. Aqui, não basta a mera observação do fenómeno; é necessário um aprofundamento reflexivo que transcenda a experiência imediata e alcance a essência do processo de RC que orienta o cuidado em situação de incerteza.

É nesta conjunção ampliada de compreensão da incerteza que surgem as questões centrais que orientam esta tese, proporcionando a base para a reflexão contínua e o aprofundamento do conhecimento na área da enfermagem perioperatória. Com o objetivo de contribuir para a gestão da incerteza no raciocínio clínico dos enfermeiros na UCPA, elaborou-se a questão: *A gestão da incerteza contribui para o raciocínio clínico dos enfermeiros na UCPA?*

Do exposto, surge a necessidade de compreender a incerteza no RC dos enfermeiros, no cuidado à pessoa em contexto de UCPA. Esta tese almeja não apenas enriquecer a prática clínica dos enfermeiros em contexto de UCPA, mas também assumir a incerteza como intrínseca ao processo de cuidado de enfermagem, e, por conseguinte, do

RC. Teve ainda o propósito de desenvolver estratégias que permitam gerir a incerteza, transformando-a numa ferramenta que enriquece o RC e aprimora a capacidade reflexiva dos enfermeiros perante a dinâmica única de cada situação de cuidados. Assim, procura-se uma prática clínica que não se limite à demanda da certeza, mas que acolha a incerteza como parte indissociável do cuidado, reconhecendo-a como uma constância essencial na dinâmica do RC, imprescindível para a adaptação à complexidade e à individualidade da experiência humana.

Métodos

Os procedimentos metodológicos adotados para operacionalizar a investigação basearam-se na necessidade de construir um desenho de estudo capaz de compreender a incerteza no RC dos enfermeiros no contexto de cuidados à pessoa em UCPA. Partindo da centralidade da incerteza como elemento constitutivo da prática clínica, a investigação procurou identificar como os enfermeiros percebem, analisam e gerem a incerteza, com a finalidade de compreender de que forma essa gestão contribui para a qualidade do RC. A investigação está ancorada na premissa de que a incerteza, longe de ser um obstáculo, pode constituir-se como uma ferramenta valiosa para a reflexão crítica e adaptável ao contexto complexo e dinâmico do cuidado como é em UCPA.

O percurso metodológico delineado privilegiou a análise aprofundada da incerteza no RC dos enfermeiros da UCPA, visando fomentar estratégias que promovam um RC mais consciente, adaptativo e reflexivo. Para o efeito, foram definidos os seguintes objetivos específicos:

1. Identificar a evidência científica disponível relacionada com a incerteza no RC dos enfermeiros em contexto de UCPA.
2. Analisar a incerteza no RC dos enfermeiros em contexto de UCPA a partir da perspetiva do MUCH-S.
3. Explorar as experiências de incerteza no RC dos enfermeiros da UCPA.
4. Descrever e analisar as barreiras e os facilitadores para a gestão da incerteza no RC dos enfermeiros da UCPA.
5. Descrever as estratégias que os enfermeiros da UCPA utilizam para gerir a incerteza no RC.
6. Analisar as estratégias para gerir a incerteza dos enfermeiros da UCPA no âmbito do IFUM e das realidades da TP de Wiedenbach.
7. Desenvolver o Teste de Concordância de Scripts em Enfermagem Pós-Anestésica (*Post-anesthesia Nursing Script Concordance Test*® - PaNSCT®) e avaliar

a sua validade de construto, confiabilidade, aceitabilidade, adequação e sustentabilidade.

8. Mapear a evidência sobre estratégias aplicadas por enfermeiros à cabeceira do doente para apoiar o RC.
9. Avaliar a viabilidade, aplicabilidade e relevância das estratégias de apoio ao RC à cabeceira do doente, através da obtenção de consenso entre peritos sobre a sua adequação na prática da enfermagem em UCPA.
10. Apresentar um ensaio crítico sobre a incerteza no RC, integrando fundamentos teóricos e implicações práticas para a enfermagem.

Considerando a especificidade da temática e a paucidade de evidência científica consolidada, tanto no contexto nacional quanto internacional, delineou-se uma estratégia multimétodo organizada em cinco etapas distintas, porém intrinsecamente interligadas. Esta organização visou, de modo sequencial e articulado, dar resposta aos objetivos traçados, promovendo uma abordagem compreensiva e reflexiva do fenómeno em estudo. A Figura 3 apresenta o alinhamento entre os objetivos específicos definidos para esta investigação e os estudos realizados.

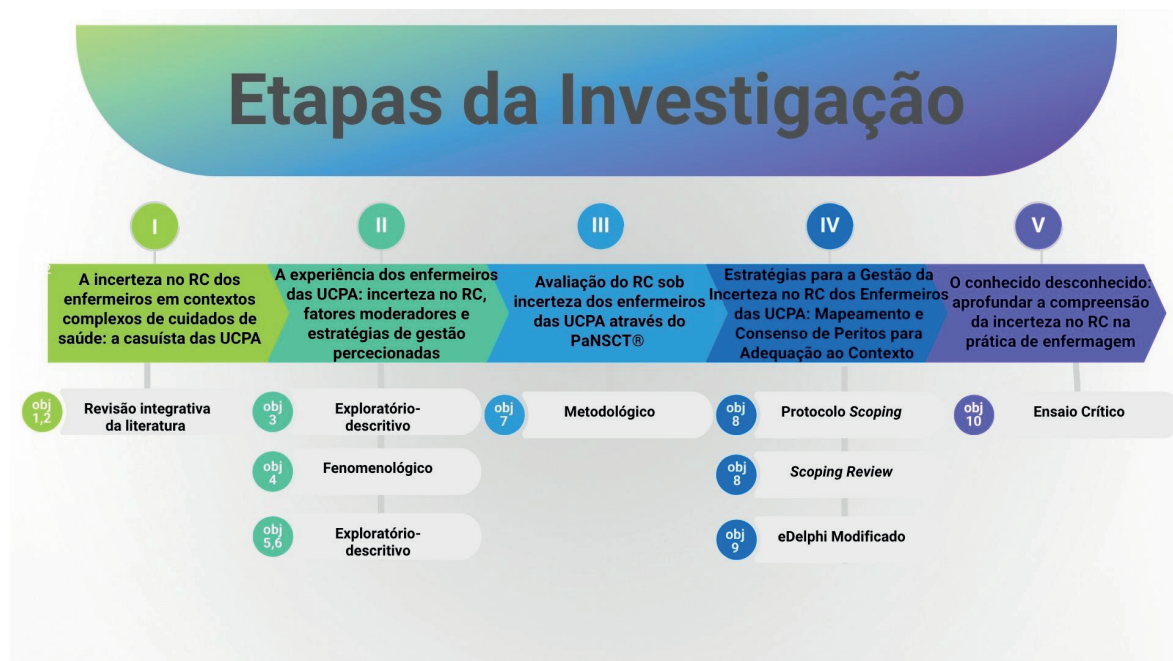


Figura 3 – Alinhamento entre as etapas da investigação, os objetivos específicos e os estudos realizados.

Na primeira etapa realizou-se uma revisão integrativa da literatura para identificar e mapear o conhecimento sobre a incerteza no RC dos enfermeiros em contextos clínicos complexos, orientada pelo MUCH-S (Pomare et al., 2019a). As questões de revisão foram: *Qual é a evidência disponível relacionada à incerteza no raciocínio clínico na enfermagem pós-anestésica?* e *Como a evidência disponível se articula com*

o modelo MUCH-S? A estratégia de pesquisa foi realizada nas bases de dados CINAHL (EBSCO), Cochrane Library (EBSCO), PubMed, ProQuest e Google Scholar, utilizando linguagem natural e termos indexados adaptados para cada fonte de informação incluída. Os dados das referências foram exportados para o *software* de gestão de referências *Endnote 20 desktop version* (Gotschall, 2021). O processo da seleção dos estudos foi apresentado no fluxograma adaptado do *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) (Page et al., 2021).

Na segunda etapa, foram realizados três estudos qualitativos com enfermeiros de UCPA, com a seguinte questão de investigação: *Quais são as experiências de incerteza no raciocínio clínico dos enfermeiros na UCPA?* Todos os estudos utilizaram amostragem por conveniência para seleção dos participantes. A colheita de dados ocorreu por meio de entrevistas semiestruturadas (ANEXO I), gravação em áudio e transcrição literal (verbatim) naturalizada. A análise dos dados foi realizada com recurso ao *software* MAXQDA Analytics Pro 2022. Para assegurar o rigor metodológico, na elaboração do relatório seguiram-se as diretrizes do *Consolidated Criteria for Reporting Qualitative Research* (COREQ) (Tong et al., 2007). Foram garantidos os princípios éticos fundamentais, com aprovação por comités de ética (Anexo II), consentimento informado (ANEXO III), anonimato sempre em conformidade com a Declaração de Helsínquia.

O primeiro estudo qualitativo (Manuscrito 2) adotou um desenho fenomenológico descritivo com base na abordagem de Husserl (2012). Neste, procurou-se compreender a essência da experiência da incerteza no RC a partir das vozes dos participantes, sem abstrair os pontos de vista pessoais. A análise dos dados foi realizada segundo o método de Colaizzi (1978), envolvendo etapas como leitura minuciosa das transcrições, extração de afirmações significativas, formulação de significados, organização em temas, descrição da estrutura essencial do fenómeno e validação dos resultados junto aos participantes. O segundo e terceiro estudos qualitativos (Manuscrito 3 e 4) adotaram um desenho qualitativo descritivo (Doyle et al., 2020). Os dados foram analisados com recurso à análise temática segundo Braun and Clarke (2006), utilizando uma abordagem híbrida indutiva-dedutiva (Howitt & Cramer, 2010).

A terceira etapa envolveu um estudo quantitativo metodológico desenvolvido em três fases principais (Mbuagbaw et al., 2020), orientado pela seguinte questão de investigação: *Qual a validade, fiabilidade, aceitabilidade e adequação do PaNSCT® como instrumento para avaliar o RC sob incerteza dos enfermeiros que trabalham no contexto clínico pós-anestésico?* A Fase I concentrou-se na construção do PaNSCT®, incluindo a elaboração de vinhetas clínicas baseadas em casos reais, seleção de um painel de peritos clínicos e desenvolvimento de uma matriz de pontuação. O teste foi estruturado conforme a teoria dos *scripts* (Custers, 2015), utilizando uma escala de *Likert* de 5 pontos para avaliar o impacto de novas informações sobre as hipóteses clínicas. A validade de constructo (Tabari-Khomeiran & Barrett, 2025) foi reforçada com a revisão por um painel científico composto por enfermeiros douto-

rados e especialistas em enfermagem perioperatória. A Fase II abordou a fiabilidade, aceitabilidade e adequação do instrumento, com dados recolhidos por enfermeiros peritos de diferentes contextos perioperatórios. A análise estatística incluiu testes de consistência interna (Alfa de *Cronbach*), normalidade e correlação entre grupos. A aceitabilidade e adequação foram avaliadas com base em respostas abertas pós-teste, analisadas qualitativamente através do conteúdo, por dois investigadores (Drisko & Maschi, 2016). Na Fase III, o foco esteve na sustentabilidade do PaNSCT®, com o registo da propriedade intelectual para garantir a proteção legal e promover o uso contínuo em contextos clínicos e educativos. Apresenta-se em anexo o parecer da Comissão de Ética do estudo apresentado no Manuscrito 5 (Anexo IV), a minuta do consentimento informado e esclarecido (ANEXO V) e o caderno de registo de dados respetivo (ANEXO VI).

Na quarta etapa, procedeu-se ao mapeamento das estratégias de suporte ao RC através da realização de uma *scoping review*, com a questão de revisão: *Quais são as evidências disponíveis sobre estratégias utilizadas por enfermeiros à cabeceira do doente para apoiar o raciocínio clínico?* Para assegurar a revisão cega na seleção dos estudos, a triagem foi realizada através da plataforma *Rayyan*. Os resultados do processo de seleção dos estudos foi resumido e é apresentado no fluxograma adaptado do *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) (Page et al., 2021).

Seguiu-se o estudo eDelphi modificado, realizado em quatro fases: desenvolvimento do questionário, pré-teste para avaliar clareza e relevância, rondas iterativas para consenso de especialistas e análise dos dados para validar estratégias de suporte ao RC no contexto das UCPAs, com a subsequente questão de investigação: *Quais são as estratégias viáveis, aplicáveis e relevantes no contexto clínico para apoiar o raciocínio clínico dos enfermeiros nas UCPAs?* A colheita de dados foi feita via Google Forms, com análise quantitativa em IBM SPSS versão 29.0 (SPSS, Inc., Chicago, IL) e análise qualitativa através da análise de conteúdo (Drisko & Maschi, 2016). Considerou-se consenso quando 75% ou mais dos especialistas concordaram (Niederberger et al., 2021). Para assegurar o rigor metodológico e a qualidade do processo, no relatório seguiram-se as diretrizes do *Recommendations for an Interdisciplinary Standardized Reporting* (DELPHISTAR) (Niederberger et al., 2024). O estudo obteve aprovação ética (ANEXO VII). O caderno de colheita de dados e a minuta do consentimento informado encontram-se disponíveis no ANEXO VIII.

Por fim, é apresentado um ensaio crítico com uma retórica argumentativa Rogeriana (Teich, 1987) sobre a incerteza no RC, que integrou os fundamentos teóricos e as implicações práticas para a enfermagem.

Capítulo I

A incerteza no raciocínio clínico dos enfermeiros em contextos complexos de cuidados de saúde: a casuística das Unidades de Cuidados Pós-anestésicos

Este capítulo inclui 1 manuscrito publicado

Disseminação

Palestra por Convite

Palestrante convidado no Painel I: Research Projects in PhD Nursing Sciences - “Clinical Reasoning of Nurses in the Post-Anesthesia Care Unit: Contributions To Manage Uncertainty”. 1st International Meeting of Doctoral Students in Nursing 2023. Instituto de Ciências Biomédicas Abel Salazar (ICBAS) e Escola Superior de Enfermagem do Porto (ESEP) (Porto, Portugal).

Resumos em atas de eventos científicos

Cunha, L.D.M., Pestana-Santos, M., Lomba, L., & Reis Santos, M. (2022). Postanesthesia Nursing Clinical Reasoning: Contributions to Managing Uncertainty. Abstract Book of *6th World Conference on Qualitative Research*, Lisbon [online], Portugal. Retrieved from: <https://wcqr.ludomedia.org/wp-content/uploads/2022/01/WCQR-2022-Abstracts-Book.pdf>.

Cunha, L.D.M., Pestana-Santos, M., Lomba, L., & Reis Santos, M. (2022). Uncertainty is certain: a proposal to handle uncertain in nursing clinical reasoning in the recovery room. Abstract Book of *8th Annual Postgraduate Research Student Virtual Scholarly Event ‘Strengthening the sustainability & Future growth of nursing research’*, Zagreb, Croácia.

Comunicações em Conferência:

Cunha, L.D.M., Pestana-Santos, M., Lomba, L., & Reis Santos, M. (2022). Can uncertainty impact the safety of healthcare? A review about uncertainty in clinical reasoning in post-anesthesia nursing. *7th Phi-Xi Talk ‘Healthcare Safety: from practice to regulation’*, Coimbra, Portugal.

Cunha, L.D.M., Pestana-Santos, M., Lomba, L., & Reis Santos, M. (2022). Uncertainty is certain: a proposal to handle uncertain in nursing clinical reasoning in the recovery room. *8th Annual Postgraduate Research Student Virtual Scholarly Event ‘Strengthening the sustainability & Future growth of nursing research’*, Zagreb, Croácia.

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MANUSCRITO 1: Uncertainty in post-anaesthesia nursing clinical reasoning: An integrative review in the light of the model of uncertainty in complex health care settings

Cunha, L. D. M., Pestana-Santos, M., Lomba, L., & Reis Santos, M. (2022). Uncertainty in post-anaesthesia nursing clinical reasoning: An integrative review in the light of the model of uncertainty in complex health care settings. *Journal of Perioperative Nursing*, 35(2), e32-e40. <https://doi.org/10.26550/2209-1092.1182>.

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Uncertainty in post-anaesthesia nursing clinical reasoning: An integrative review in the light of the model of uncertainty in complex health care settings

Abstract

Problem identification: Post-anaesthesia nursing plays an important role in the early detection and treatment of clinical deterioration after surgery and/or anaesthesia. Concomitantly, the effectiveness of post-operative care is highly dependent on the accurate analysis, synthesis of patient data and quality of diagnostic decisions through clinical reasoning. Given the dynamic processes required to come to a diagnosis, uncertainty is common in clinical reasoning and expected during practice. Nevertheless, uncertainty may permeate the foundations of clinical reasoning, which can jeopardise diagnostic accuracy and consequently the quality and safety of health care.

Literature search: The objectives of this review are to identify available evidence related to uncertainty in post-anaesthesia nursing clinical reasoning and to analyse the results from the perspective of the Model of Uncertainty in Complex Healthcare Settings (MUCH-S). A comprehensive search strategy using CINAHL (EBSCO), Cochrane Library (EBSCO), Medline (PubMed), ProQuest and Google Scholar databases was used to find published and unpublished relevant studies. Studies published in English and Portuguese were included. There was no temporal restriction, nor geographical or cultural limitation for the studies included.

Data evaluation synthesis: All papers were reviewed by the authors to extract key information about purpose, sample and setting, research design and method, key findings and limitations. The literature search identified a total of 248 studies, 22 of which were retrieved for full reading. A total of four articles were included in this review.

Implications for practice: Three main themes were identified: nurses' intuition to reason, feelings of uncertainty related to lack of nursing knowledge and clinical (in)experience to deal with uncertainty. These findings are encompassed within the MUCH-S taxonomy: personal, scientific and practical. This review offers post-anaesthesia nurses' greater levels of understanding of this phenomenon and may support more informed and reflexive clinical reasoning.

Keywords: clinical reasoning, patient safety, post-anaesthesia nursing, post-operative care, uncertainty

Introduction

Post-operative nursing care occurs in an uncertain and changing environment and post-operative nursing practice is complex, highly challenging and demands quick and efficient decision making.¹ This period of critical care, and of great vulnerability for the person being cared for, comes with the risk of complications associated with surgery and anaesthesia. Complications occur in 40 per cent of cases² with half of these occurring during the first hour after admission to the Post Anaesthesia Care Unit (PACU)³ and 16.5 per cent being adverse events after discharge.⁴ The reality is that patients' presentations in PACU are often obscure, uncertain and ill-fitting with a model of linear causality.⁵ This means there may not be a straightforward relationship between causes and effects.⁵

It is also important to consider the attributes of the post-anaesthesia clinical scenario where nurses' work is highly influenced by interpersonal and interdisciplinary professional relationships,⁶ diplomacy and collaborative competence are critical,⁷ a highly specialised performance is necessary to manage complex clinical cases,⁸ quick and distinct discernment is required when making decisions,⁹ patients are vulnerable and dependent on nursing care¹⁰ and environmental conditions and occupational exposure increase professional risk.¹¹

Up to 70 per cent of adverse events are related to lapses in anaesthetists' non-technical skills, such as communication, teamwork, leadership, decision-making and risk assessment. Experience and observation are factors influencing situational awareness,¹² another non-technical skill. Situational awareness is the perception of environmental elements and events with respect to time or space, the comprehension of

their meaning, and the projection of their future status.¹² Errors associated with medical diagnoses are related to more than ten per cent of all health care costs.¹³ Direct costs accrue from failure to treat, inappropriate testing and treatments for incorrect diagnoses.¹³ Given these facts, awareness of uncertainty increased physicians' anxiety which translated to a 17 per cent increase in average health care costs.¹⁴

The conceptualisation of uncertainty, which partly comes from maturity, appears as a professional gains experience in practice.¹⁵ In relation to nursing discipline, uncertainty is described as a cognitive and emotive component, interrelated with stress and coping¹⁶ derived from and related to ethical decision-making.¹⁷ Nursing uncertainty research is mainly focused on a person's illness experience¹⁸ but is hazy in regards to a nurse's reactions in clinical practice and their adaptive behaviours.

Diagnosis usually occurs under a veil of uncertainty so that those who identify it must develop advanced probabilistic reasoning skills given the well-known fact that intuitive probabilistic arguments are very likely to be biased. This also relates to the nature of the diagnostic framework, namely the normative criterion, the temporal structure and the teleological component.¹⁹ Authentic clinical reasoning requires nurses to collect and interpret imperfect clinical data in real time. Learning how to successfully navigate uncertainty in this complex and ambiguous setting is essential for patient safety and high-quality care.²⁰ For this reason, clinical reasoning becomes relevant to gain an understanding of the phenomenon of uncertainty in post-anaesthesia nursing.

The Model of Uncertainty in Complex Health care Settings (MUCH-S),²¹ based on Han's Model,²²

will be the guide to enhancing the understanding of the phenomenon in this review. MUCH-S is a recent three-dimensional model, or conceptual taxonomy, and characterises uncertainty in three broad categories: personal, scientific and practical. Specific issues are gathered into these categories: psychosocial, existential and ethical issues in the personal category; diagnosis, prognosis, causal explanations and treatment recommendations in the scientific category; and structures of care, processes of care and systems in the practical category.

Review methods

Following the methodology of an integrative review,²³ the research questions are:

- What is the available evidence related to uncertainty in post-anaesthesia nursing clinical reasoning?
- How does available evidence related to uncertainty in post-anaesthesia nursing clinical reasoning fit with the MUCH-S?

The literature search was conducted in the CINAHL (EBSCO), Cochrane Library (EBSCO), Medline (PubMed) databases and ProQuest and Google Scholar, in October 2021, using the natural language and index terms adapted for each included information source (See Figure 1). To ensure the hypothetical inclusion of recently published articles, we performed an additional research on 21 January 2022, with no extra findings.

Reference details for all returned searches were downloaded into the reference manager software, Mendeley. Duplicates were removed, then title and abstracts were screened by the first author against the inclusion criteria: empirical output, context of the PACU setting

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((((('Postanesthesia Nursing'[Mesh]) OR 'Perioperative Nursing'[Mesh]) OR 'Postoperative Care'[Mesh]) OR
('postanesthesia nursing'[Title/Abstract] OR 'perianesthesia nursing'[Title/Abstract] OR 'postoperative care'[Title/
Abstract] OR 'postoperative period'[Title/Abstract])) AND (('Uncertainty'[Mesh]) OR (uncertainty[Title/Abstract] OR
'personal uncertainty'[Title/Abstract] OR 'scientific uncertainty'[Title/Abstract] OR 'practical uncertainty'[Title/
Abstract] OR ambiguity[Title/Abstract] OR ambiguous[Title/Abstract] OR unsure[Title/Abstract] OR unpredict[Title/
Abstract] OR doubt[Title/Abstract] OR equivocal[Title/Abstract])) AND ('clinical reasoning'[Title/Abstract] OR 'decision
making'[Title/Abstract] OR 'decision-making'[Title/Abstract]))

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Filters: English; Portuguese.

Figure 1: Search expression example

and experience(s) of uncertainty discussed from the nursing perspective. Reference lists of included articles were also screened to identify additional studies. Any geographical, cultural, temporal or study type limitations were applied. Search results and studies selection were summarised in a flowchart adapted from Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA)²⁴ (see Figure 2).

After removing duplicates and screening the remaining 248 studies by title and abstract, 22 were retrieved in full text and screened. Considering the inclusion criteria, four studies were included in the review.

Results

Studies originated from Sweden (n = 2), Canada (n = 1) and South Korea (n = 1). Clinical settings are general,²⁵ orthopedic²⁶ and surgical^{27,28} caring for adult patients in the PACU. Nurses were recruited from mid-sized hospitals²⁵ and from major public hospitals^{26,27,28}. All studies are qualitative and used semi-structured interviews for data collection. The number of participants varied from 9 to 20, with a ratio of 4:1 females to males. The participants' clinical experience ranged from 1 to 32 years. The characteristics and key findings of the studies included are summarised in Table 1.

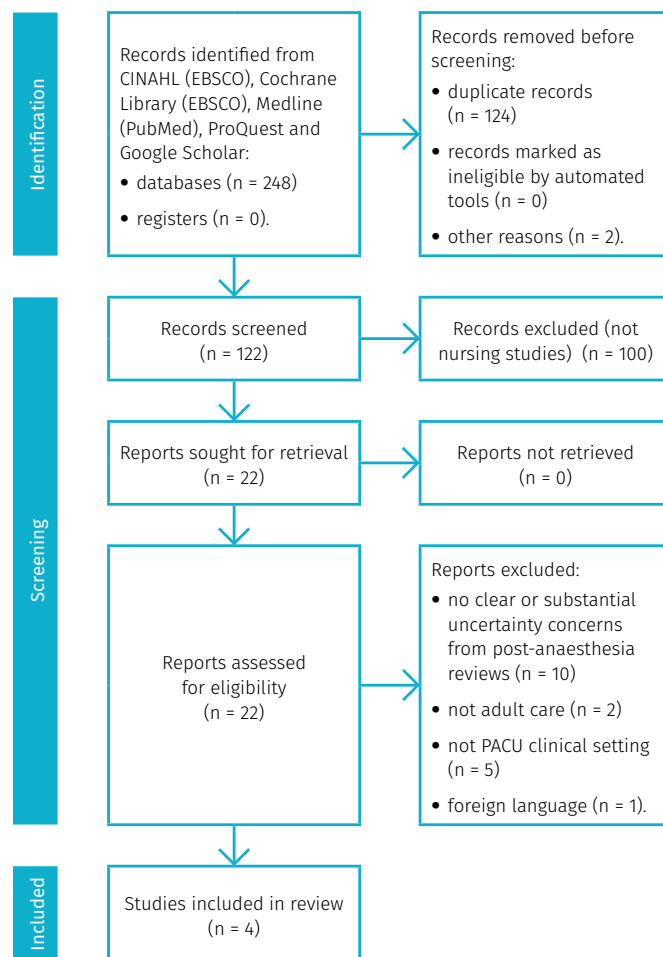


Figure 2: PRISMA flow diagram of review process

Table 1: Characteristics of included studies

Study (year)	Purpose	Sample and setting	Research design and method	Key findings
Calebrant et al. (2016) ²⁸	To determine the factors that affect how nurse anaesthetists in a county in Sweden decide how to manage perioperative fluid status.	n=16 nurse anaesthetists professionally qualified for at least two years	cross-sectional qualitative study through semi-structured interviews	Three categories emerged: 1. clinical criteria and thought processes that drive decision making 2. interdependence in decision making 3. uncertainty in decision making. They lacked guidelines and, at the same time, it was emphasised that each patient must be treated individually.
Forberg et al. (2017) ²⁷	To describe nurse anaesthetists' reflections on the provision of perioperative care to patients with previous substance dependence.	n=10 nurse anaesthetists from two surgical departments in Sweden	interpretative study with semi-structured interviews based on clinical vignettes	Nurses revealed a process of balancing between professionalism and preconceptions. This was based on three categories: 1. an anaesthesiological challenge of knowledge, experience and time 2. feelings of mistrust due to the difficulty in dealing with this group of patients 3. feelings of uncertainty because of lack of knowledge. The nurse anaesthetists experienced that these patients tended to react differently to anaesthesia and some nurses felt that their knowledge was not sufficient for taking care of patients. This requires skills, expertise, experience, time, open-mindedness and intuition. If guidelines were developed for this patient group, care could be made safer and nurses' sense of uncertainty minimised.
Jang et al. (2019) ²⁹	To identify nurses' experiences related to the reasoning methods employed during post-operative pain assessment.	n=20 nurses from the orthopaedic surgery ward of a university hospital in Seoul, South Korea	phenomenography Nurses were interviewed after post-operative pain assessments. A total of 60 patients who had experienced post-operative pain were discussed in the nurses' interviews.	The reasoning used by nurses in post-operative pain assessment was identified from two perspectives: 1. the frames of reference used to interpret a patient's perception of pain 2. the strategic efforts used to assess the pain. Holistic clinical pain assessment is the product of both the personal knowledge of the nurse involved and the practical knowledge that the nurse has developed through intuition. Nurses' own reasoning in post-operative pain assessment appears to reflect various forms of clinical knowledge, drawing from a variety of sources of information and taking into account multiple factors, some of which are unexplained by the research evidence.
Shannon et al. (2020) ²⁵	To explore PACU nurses' interactions with technology during the critical Phase I recovery period.	n=9 PACU nurses in three mid-sized hospitals in a Western Canadian province	interpretive description Nurse participants were interviewed using a semi-structured interview guide.	Nurses' interactions with technology are significantly influenced by the recovery room culture, as they constantly navigate through a level of uncertainty about the respiratory status of their patients. Three themes are described: 1. nurses' confidence and trust in a visual sensory respiratory assessment process and the influence of anaesthesia providers 2. PACU nurses' guarded trust or rationalised mistrust in technology 3. contextual influences on nurses' approach to respiratory assessment. Post-anaesthesia nurses practice their intuitive sensory assessments with a strong projected sense of expert practice and minimal reliance on technology.

The key findings were organised by the following themes, identified through deductive coding into MUCH-S taxonomy: 'nurses' intuition to reason' (personal), 'feelings of uncertainty related to lack of nursing knowledge' (scientific) and 'clinical (in)experience to deal with uncertainty' (practical). Firstly, the explicit empirical indicators of MUCH-S taxonomy were applied to the data analysis and confirmed that the codes appear in the data by finding examples. Secondly, themes were identified by pattern response and meaning and articulated with the propositions of the review. Finally, pattern matching was applied and compared the dataset with the MUCH-S framework through abductive inference.²⁹

In 'nurse's intuition to reason as personal uncertainty', the psychosocial issue of communicating uncertainty manifests itself as a clinical assessment difficulty related to the influence of personal, practical knowledge and intuition factors.²⁶ The existential issue is due to the difficulty of understanding patient's behaviour and anticipating critical events.²⁷ The ethical issue is due to the difficulty in navigating through a more intuitive nursing practice.²⁵

In 'feelings of uncertainty related to lack of nursing knowledge as scientific uncertainty' associated with diagnosis issues, nurses rationalised their mistrust in technology based on their personal beliefs about what clinical data readings are acceptable²⁵ and reported insecurity related to scientific knowledge deficit²⁷ and differences in practice related to clinical experience.²⁸ In the prognosis issue, nurses revealed difficulties in predicting patients' unexpected reactions to the anaesthesia and preventing adverse events.²⁷ In the causal explanations issue, nurses struggled to balance

the relationship between patient's own needs assessment and nurse's assessment.²⁶ Related to treatment recommendations issues, nurses had difficulty challenging anaesthesia care due to insufficient knowledge²⁷ and lack of time to evaluate the impact of nurses' intervention.²⁸

In 'clinical (in)experience to deal with uncertainty as practical uncertainty' related to structure of care, nurses adapted their evaluation priorities to the anaesthetist's preferences.²⁵ In processes of care, nurses reported feeling confused when there is variability in individual anaesthesia handover practises²⁵ (especially when they contradict evidence-based practises) and refer to peer counselling for evidence-based practice when difficult situations arise.²⁸ In the system's issues, nurses reinforce the need for clinical practice guidelines adapted to particular situations.^{27,28}

Discussion

The aims of this review were to identify available evidence related to uncertainty in post-anaesthesia clinical reasoning and to analyse the results from the perspective of the MUCH-S model, which uses the taxonomy of personal uncertainty, scientific uncertainty and practical uncertainty. To our knowledge this is the first review study about the phenomenon of uncertainty in post-anaesthesia nursing clinical settings. The results were analysed using the MUCH-S model to facilitate understanding. The results presented in this paper highlight the complexity of this topic; additionally, nurses' difficulties were identified.

Nurses' intuition to reason as a personal uncertainty

Personal uncertainty is related to three main issues: psychosocial (communicating uncertainty),

existential (effects of illness or treatment on life goals and quality of life) and ethical (inconsistency between self-values, sociocultural codes, the health care system and the organisation).²¹

Uncertainty is primarily managed through communicative practises, which emphasise communication in moderating the effect of uncertainty on health care decision-making.³⁰ As a matter of fact, pain assessment through personal knowledge, practical knowledge and intuition, allows the post-anaesthesia nurse to take clinical action leading to patient-centred care.²⁶ Coincidentally, uncertainty affects a nurse's ability to maintain patient-centredness during patient-nurse conversation.³⁰

Making predictions while uncertain is a challenge that nurses face daily in their practice. Nurses anticipate events based on experiences of past events in similar situations. Exposure to similar situations plays a decisive role in anticipating future events.^{31,32} Safe work performance³³ cannot be expected from workers whose job designs involve multiple competing urgent priorities. Nurses need to develop skills to manage the unpredictable nature of their work, including dividing up care throughout the shift and redefining or adapting their care throughout.³³

Given the mission of the PACU, nurses receive patients at high risk of complications, requiring close nursing clinical surveillance. If patient outcome may be maximised with guidelines,^{27,28} an early recognition and intervention process is fundamental for preventing the occurrence of adverse events. Under certain circumstances and conditions of uncertainty (epistemic and random, tangible or not), deviations from reference situations can pose a specific threat to a given objective.³⁴ Patients' non-rational thinking and

behaviour (unnecessarily exposing themselves to factors that could be a direct threat to their life) made some nurses feel that patients with previous substance dependence were difficult to understand.²⁷ Nurses can apply simple strategies to recognise and effectively deal with existential uncertainty, including attending to emotions, slowing down clinical reasoning, exploring certainty within uncertainty and partnering with the patient.³⁵

As we move towards more complex patient problems, we increasingly recognise the importance of non-analytical but integrative parts of clinical reasoning by recognising patterns and using clinical intuition.^{25-27,36} Analytical and non-analytical reasoning³⁷ can operate separately but are mainly interconnected in clinical practice; to illustrate the complexity-based approach, the application of systemic thinking can benefit the understanding of clinical reasoning.³⁶ If, on one hand, nurses demonstrate confidence in their professional practice, on the other hand they demonstrate difficulties in articulating a subconscious and intuitive assessment approach.²⁵ This captures ethical uncertainty.²¹

In short, the collective consciousness of scientific knowledge is seen as the realm of absolute certainty and separate from the impressionistic knowledge of human intuition.³⁸

Feelings of uncertainty related to lack of nursing knowledge as a scientific uncertainty

Scientific uncertainty includes issues related to diagnosis (classifying symptoms to abstract criteria), prognosis (regarding the longevity of disease), causal explanations (cause of illness) and treatment

recommendations (regarding best mode of treatment).²¹

A study into post-anaesthesia nurses' reflections about caring for patients with previous substance dependence²⁷ reported that nurses feel uncertainty because of lack of knowledge and difficulty interpreting symptoms in these patients. The juxtaposition of nurses' desire to perform safe and good care with their preconceptions and inability to understand these patients affects both pre-operative and post-operative care.²⁷

Clinical reasoning, as the process of applying knowledge and expertise to a clinical situation to develop a solution, involves the processes of cognition and metacognition.³⁹ Clinical reasoning in nursing revolves around the process of making professional judgements, evaluating the quality and contribution of available evidence to enhance problem solving and to consider to what extent the evidence available is sufficient to base decisions on and provide diagnosis and relevant treatment in regards to nursing care.⁴⁰ It also integrates meaningful phenomenological perceptions, experience, patient diversity and the uniqueness of the patient situation.⁴¹ Nurses reported having insufficient knowledge of the pathophysiologic conditions associated with substance dependence during anaesthesia. This resulted in insecurity, especially in specific situations like determining the dosage of intravenous drugs.²⁷

Clinical reasoning is viewed as a multidimensional, recursive cognitive process that employs formal and informal strategies to assemble and analyse patient information that is then evaluated relative to its significance and contribution to patient management.⁴² Clinical reasoning allowed, for example, for nurses to rationalise their mistrust of

technology based on their personal beliefs about what were acceptable respiratory data readings.²⁵

Clinical reasoning competence is an essential nursing skill for providing safe and quality patient-centred care.^{43,44} Effective clinical reasoning skills are found to be positively correlated with patient outcomes – nurses with poor clinical reasoning skills often fail to recognise impending patient deterioration or fail to prioritise appropriate interventions which may result in a failure to rescue or an irreversible situation. Post-anaesthesia nurses found it difficult to determine pharmaceutical dosage and know how to deal with patients' unexpected reactions to the anaesthesia and their behaviours.²⁷

To address the inaccurate clinical reasoning associated with inappropriate interventions that could lead to increased and untimely patient mortality, Levett-Jones et al.,⁴⁵ created the Clinical Reasoning Model. This is represented as a circled eight-step diagram that reflects the ongoing and cyclical nature of clinical interventions and the importance of evaluation and reflection. When providing nursing care based on the reasoning cycle, nursing professionals learn to recognise, understand and work in each step, rather than just assuming they understand the patients' problems and perform interventions without adequately using higher order thinking. The recognition of the relationship between a patient's limited ability to express the intensity of their pain and the actual intensity of their pain is an important factor in nurses' post-operative pain assessments.²⁶ In this sense, effective clinical reasoning skills are a key factor in the prevention of iatrogenic harm.⁴³

It is also important to mention research which measured the effects of guided clinical reasoning on the quality of the advanced nursing process in the knowledge and nurse's attitude.⁴⁶ Leoni-Scheiber et al., developed an educational approach aiming to improve nurses' diagnostic competencies to allow accurate nursing diagnoses and to link these with effective nursing interventions to achieve favourable patient outcomes.⁴⁸ Guided clinical reasoning data revealed improvement in nursing assessments, refinement of nursing diagnoses accuracy and effectiveness of nursing interventions.⁴⁶

Post-anaesthesia nurses revealed that health care delivery becomes a challenge when their knowledge proves to be insufficient.²⁷ So, evaluating clinical reasoning in a context of uncertainty can also contribute to direct strategies for the teaching and learning of this competence.⁴⁷

Clinical (in)experience to deal with uncertainty as a practical uncertainty

Practical uncertainty encompasses structures of care (absence of clarity regarding the expectations and responsibilities), processes of care (unclear procedures to access care) and systems (lack of clarity in system guidelines).²¹

Uncertainty is expressed in situations with distracting contextual factors, most of all in diagnosis and least in reflection.⁴⁸ Nurses' perceptions of inconsistent practises and processes of care of individual anaesthesia providers were often compromised by prioritising relationships over best practices.²⁵ In the absence of clarity regarding the expectations and responsibilities in care structure, post-anaesthesia nurses tend to adapt their assessment priorities to

the preferences of the anaesthesia provider.²⁵ These results highlight how linguistic markers of uncertainty can shed light on the role contextual factors might play in uncertainty, which can lead to error, and why it is essential to find ways of managing it.

Research into uncertainty in health care has found that when there is lack of clarity in a system's guidelines nurses work to tame uncertainty, shape the environment and set boundaries around what can be tolerated and normalised.⁴⁹ This was highlighted by post-anaesthesia nurses who expressed a need for guidelines when caring for patients with substance dependence,²⁷ managing inotropic medication and applying restrictive fluid therapy.²⁸

Nurses described confidence in their intellectual capacity based on their experience, perceptions and behaviours. Some of them referred to confidence in their ability to reason and described their base knowledge as tenuous, that is, accompanied by uncertainty and insecurity.^{27,28,50} Thus, experienced post-anaesthesia nurses reported planning how they would act. The less experienced nurses used theoretical knowledge and comparison of different parameters to assess fluid requirements and later conferred with the anaesthetist.²⁸

Feelings that can be attributed to nurses' uncertainty include anxiety, ambiguity, discomfort and stress. Additionally, their response to stress and uncertainty can directly impact patient care.⁵¹ When in difficult situations related to fluid therapy, the post-anaesthesia nurses advised each other to use evidence-based practice.²⁸ Accordingly, some nurses found more clarity during times of uncertainty while other nurses reported negative emotional and physiological responses when faced with unresolved uncertainty. A positive response to a feeling of

uncertainty may lead a nurse to seek trusted resources to work through the issue causing the uncertainty. Additionally, patients benefit when a nurse positively manages stress and uncertainty because the nurse finds more clarity or focus for patient care. Conversely, continuous practice in uncertain situations can negatively influence nurses' confidence, increase doubts and negatively impact satisfaction in practice.⁵¹

Practical knowledge of how a nurse perceives a patient's status in clinical settings and how a patient is assessed need to be fully explored to gain a practice-based understanding of clinical reasoning. How do nurses integrate scientific evidence into practical decisions? How are they taught the process of clinical reasoning in contexts of uncertainty in an era where it is believed that doubt can be resolved simply with the advent of evidence-based practice? Research concerning nursing clinical reasoning continues to be needed to understand nurse cognition in complex situations involving uncertainty. Increased knowledge and experience may decrease uncertainty in practice, but even with policies and resources in place, uncertainty may still occur.⁵² Dealing with uncertainty requires humble reflection on our systems with an open mind to complex dynamics and emergent patterns.⁵³

Conclusion

A significant gap remains in nursing scientific evidence related to uncertainty in complex clinical settings in health care. This integrative review briefly expresses the incipient understanding of post-anaesthesia clinical reasoning under uncertainty using the MUCH-S taxonomy of personal, scientific and practical uncertainty. The main themes identified were nurses'

intuition to reason (encompassed within personal uncertainty), uncertainty related to lack of knowledge (encompassed within scientific uncertainty) and clinical (in) experience to deal with uncertainty (encompassed within practical uncertainty).

For nurses, communicating uncertainty in clinical pain assessment, dealing with patient's behaviours and articulating intuitive professional practice are all associated with personal uncertainty. Related to scientific uncertainty, nurses struggle with balancing personal beliefs, lack of scientific knowledge and limited clinical experience with their clinical practice. The challenging relationship with patients impacts the recognition of causal explanations. Allied with practical uncertainty, the variability of individual anaesthesia providers' practises can induce uncertainty in nurses.

This review has some limitations. Only four studies met the inclusion criteria. Evaluation of the methodological quality of the included studies was not performed and, although reflexivity was considered for strengthening rigour and minimising potential bias in coding, the potential subjectivity in categorisation related to deductive coding into MUCH-S taxonomy is latent. Furthermore, due to the intrinsic characteristics of an integrative review, the scope is limited.

To support post-anaesthesia nurses to learn to manage complex clinical scenarios effectively, it is essential further research is conducted to understand the process of clinical reasoning. Analysing how personal, scientific and practical uncertainties shape clinical reasoning and lead to nursing outcomes also might be particularly important.

Despite the great benefits of uncertainty analysis and its application in certain contexts, it should not be considered as a panacea to guarantee absolute security. Notwithstanding, evidence suggests that uncertainty comprehension has in its favour the very positive fact that it places uncertain consequences or effects at the centre of decisions, thus being able to contribute to the improvement of safety in post-anaesthesia health care.

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Capítulo II

A experiência dos enfermeiros das Unidades de Cuidados Pós-anestésicos: incerteza no raciocínio clínico, fatores moderadores e estratégias de gestão percebidas

Este capítulo inclui 3 manuscritos publicados

Disseminação

Artigo em Conferência

Cunha, L.D.M., Pestana-Santos, M., Lomba, L., & Reis Santos, M. (2024). Atitudes dos enfermeiros do perioperatório face à incerteza no raciocínio clínico. *Revista Científica Internacional RevSALUS* | Suplemento Nº 7, p.53-56. ISSN: 2184-4860.

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MANUSCRITO 2: “A Certainty for you Does Not Mean That it is a Certainty for Science”: A Phenomenological Analysis of Experiences of Uncertainty in Clinical Reasoning of Nurses in the Postanesthesia Care Unit

Cunha, L. D. M., Pestana-Santos, M., Lomba, L., & Reis Santos, M. (2024). “A Certainty for you Does Not Mean That it is a Certainty for Science”: A Phenomenological Analysis of Experiences of Uncertainty in Clinical Reasoning of Nurses in the Postanesthesia Care Unit. *Journal of PeriAnesthesia Nursing*, 39, 409-416. <https://doi.org/10.1016/j.jopan.2023.08.024>

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Research

“A Certainty for you Does Not Mean That it is a Certainty for Science”: A Phenomenological Analysis of Experiences of Uncertainty in Clinical Reasoning of Nurses in the Postanesthesia Care Unit



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ABSTRACT

Keywords:

clinical reasoning
patient safety
postanesthesia nursing
uncertainty

Purpose: To explore the experiences of uncertainty in the clinical reasoning of nurses in the postanesthesia care unit (PACU).

Design: A phenomenological descriptive design, following Colaizzi's analysis.

Methods: Semistructured interviews were conducted with 14 nurses from a PACU on their experience of uncertainty in clinical reasoning. The interviews were digitally audio-recorded and transcribed *verbatim*. Two researchers conducted data analysis independently and followed seven phases: (re)reading the transcripts, extracting significant statements, formulating meanings from significant statements, aggregating formulated meanings into themes, developing a description of the phenomenon's essential structure, generating of the fundamental structure of the phenomenon, validating of the findings through participant feedback. The process employed MAXQDA analytics Pro 2022 software. Consolidated Criteria for Reporting A Qualitative Research checklist was used for reporting.

Findings: From uncertainty experiences in nurses' clinical reasoning, 10 themes emerged: ambiguity and decision latitude, communication, work ethic, difficulty interpreting and predicting outcomes, cognitive performance impairment, incivility, core competence vagueness of postanesthesia nurses, high-tech care, (in)security and risk, and occupational stress.

Conclusions: The experiences of uncertainty in clinical reasoning of nurses in postanesthesia care units are highly focused on patient safety. Exploring these experiences has made uncertainty more tangible and explicit, which will enable nurses in postanesthesia care units to prepare for adaptive responses to deal with uncertainty when it occurs in clinical practice.

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Safe and successful recovery after surgery requires patient-specific postoperative care, in which nurses make complex decisions based on careful and distinctive assessment.¹ This requirement for accurate clinical reasoning and working proactively at a fast pace with the patient demands that the nurse in the postanesthesia care unit (PACU) plan appropriate and complex care with specific core competencies.²

A critical aspect of the effectiveness of PACU nurses' decision-making relates to the complexity of clinical reasoning based on the interpretation of imperfect and usually incomplete clinical data.³ The complex information process under uncertainty, in which reasoning may not be justified in light of available knowledge, leads to a metacognitive effort required to reflect on the uncertainty, and on the actual and potential responses best suited to the situation.⁴ This normative challenge must recognize uncertainty as metacognitive consciousness and openness toward acknowledging ignorance.⁵

The response to these uncertainties is mediated through strategies focused on different targets: ignorance, uncertainty, the responses to uncertainty, the person who experiences it.⁴ Uncertainty tolerance is 'an

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individual's dispositional incapacity to endure the aversive response triggered by the perceived absence of salient, key, or sufficient information, and sustained by the associated perception of uncertainty.⁶ Thus, uncertainty tolerance is on a spectrum of maladaptive/resistance or acceptance/attenuation. What determines the appropriateness of responses to uncertainty is not purely nurses' logical consistency, but the extent to which it allows individuals to adapt to the uncertainties they experience.⁴

A recent integrative framework for uncertainty management,⁴ with a set of normative and systematic goals, aims to acknowledge the fallibility of one's own knowledge, the unrealistic epistemic expectations, and how individuals can tolerate health care uncertainty. To assess the uncertain situations, tasks are defined, namely: establishing a diagnosis (source, issue, locus), assessing prognosis (reducible or irreducible), clarifying goals (ignorance-focused, uncertainty-focused, response-focused, person-focused), and determining treatment (cure, palliation, tolerance). Adding to this framework, Luhmann and colleagues⁷ research presents evidence that people with low uncertainty tolerance tend to choose options that are riskier and less beneficial, as long as they involve less waiting time in an uncertain situation. Other recent work related to the COVID-19 pandemic showed that nurses experienced challenging emotions in the context of uncertainty, which led to long-term mental health challenges.⁸ Additionally, Thorne⁹ underlines the importance of nursing in uncertain times, in which nurses demonstrate a sense of service in complex and compromised conditions.

Although there are studies related to patients' experience of uncertainty in illness,^{10–12} there is a paucity of research on health care providers' experiences of navigating uncertainty, especially the nurses. From a practical point of view, the effort to reduce the uncertainty associated with health care takes time for the diagnostic investigation to be completed, and the intervention results manifest. From a theoretical point of view, many uncertainties are simply not reducible by adding new information through quality empirical evidence, as there is not definitive answer to provide the 'right' care for a given patient. Understanding the experiences of uncertainty in clinical reasoning is an extremely important task and deserves attention as nurses deal with uncertainty to provide safe care. Better characterization of uncertainty experiences can show strategies to manage it more effectively in clinical practice. Therefore, the aim of this study is to explore the experiences of uncertainty in the clinical reasoning of nurses in the PACU.

Methods

Study Design

The design of this study is a phenomenological descriptive design following Colaizzi's data analysis.¹³ Husserl's¹⁴ descriptive phenomenology approach was adopted to interpret the phenomenon through the essence of the experience revealed by the participants' voices, retaining them without abstracting their point of view through analysis.

To ensure explicit and comprehensive reporting of the study the consolidated criteria for reporting qualitative research (COREQ) checklist¹⁵ was applied.

Ethical Considerations

Ethical approval (date: 14/04/2022, code: 260 CES) was obtained from the ethics committee of the research unit of a university central hospital where the study was carried out. Informed consent was obtained from all participants before the interview. The confidentiality of participants' statements was preserved using letters and numbers to code (eg, P1).

Participants

Fourteen participants were recruited using an information e-leaflet regarding the type of study, research purpose, and data collection methods. The first author asked the nurse manager to share the research opportunity with PACU nurses via an institutional email announcement. Interested nurses contacted the first author who performed additional screening to verify their eligibility.

A convenience sampling was used. Nurses who provide post-operative care in phase I,¹⁶ in the adults PACU, were selected to participate in the study. The nurses were recruited from only one PACU, with an average of 30 to 35 surgeries per day and 8,478 admissions per year, on average. Postanesthesia care was provided to all surgical specialties (urology, general, maxillofacial, plastic and reconstructive, vascular and angiology, dermatology, gynecology and obstetrics, neurosurgery, orthopedics, genito-urinary, and sexual reconstructive unit), nonsurgical (arrhythmology, hemodynamics, neuroradiology, psychiatry—electroconvulsive therapy), special programs (brain aneurysms, liver transplantation, kidney transplantation) and multidisciplinary approach to acute and chronic pain. Nurses in training and integration were excluded. All nurses who expressed interest in participating in the study were included and none dropped out.

Data Collection

Data were collected using a semi-structured interview guide based on the results of a previous literature review¹⁷ (Table 1) and were digitally audio-recorded with the participants' consensus.

Data were collected from April to May 2022 at the anesthesiology service in a quiet room. Each participant was interviewed once by the same researcher (first author). The researcher is a doctoral student, and was trained by the research team, who have extensive experience in qualitative research. Furthermore, the participants knew in advance the academic reasons for carrying out the research. Biases and preassumptions were not reported by the participants. Only the interviewer and the participant were present during the interview time.

The interviews ranged from 30 to 64 minutes (average 45 minutes). Field notes were written promptly after to clarify speech pauses. After the transcription, each interview returned to the respective participant for validation. Since the interview was conducted in the native language of the participants, Portuguese, the linguistic validation process included direct translation (two independent nurses translated the source material into the target language). The translations were then combined into the best version of both translations. The back-translation (into the original language) was elaborated, and the final revision carried out.

Data saturation was reached with 10 interviews, meaning that no new information was found in the additional data.¹⁸ However, all the 14 nurses who were willing to participate in the study were interviewed.

Table 1
The Semi Structured Interview Guide

Questions
1. What is uncertainty for you?
2. What is your perception of uncertainty related to the clinical reasoning of nurses in the postanesthesia care unit?
3. In what situations of clinical practice does (or can) uncertainty occur in the clinical reasoning of nurses in the postanesthesia care unit?
4. Thinking about your personal experience and your knowledge of working in the postanesthesia care unit, how do you think the uncertainty is experienced in the clinical reasoning of nurses in the postanesthesia care unit?

Data Analysis and Interpretation

The interviews were transcribed verbatim to a Word document stored on the Google Drive platform with encrypted access and later migrated to data analysis MAXQDA Analytics Pro 2022 software.

Data analysis was carried out by two authors independently, following the seven phases of Colaizzi's analysis: (re)reading the transcripts, extracting significant statements, formulating meanings from significant statements, aggregating formulated meanings into themes, developing a description of the phenomenon's essential structure, generating fundamental structure of the phenomenon, validating the findings through participant feedback.¹³ To reach an intercoder agreement, a meeting of all the researchers was held afterward. The themes generated across datasets were based on consensus among researchers and participants' validation.

Rigor

Data reliability was guaranteed by maintaining their authenticity. Preconceptions coming from the first author's professional background (a female medical surgical nurse specialist in PACU and doctoral student) were bracketed, by asking open-ended questions during the interview to allow participants to share their views about their experiences freely. The second author (with a background in qualitative methods) analyzed the data independently to prevent preconceived expectations. The first two authors analyzed the data and differences in interpretations were solved through discussion. Credibility was demonstrated by gathering rich and in-depth data from the interviews, transcribed literally. Content validation of results was obtained by participants, and their confirmation of the themes was reached. An external audit was carried out by the remaining authors, who checked the transcripts and analysis of the interviews to ensure accuracy.

Results

The demographic characteristics of the participants are presented in Table 2.

Ten themes emerged from uncertainty experiences in nurses clinical reasoning: (1) ambiguity and decision latitude, (2) communication, (3) work ethic, (4) difficulty interpreting and predicting

Table 2
Demographic Characteristics of the Participants (N = 14)

Demographic Characteristics	n	%
Gender	4	28.6
Male	10	71.4
Female		
Age	4	28.6
(30–39 years)	7	50
(40–49 years)	3	21.4
(50–59 years)		
Qualification	8	57.2
Without any nursing specialization	3	21.4
Medical surgical nursing specialization	2	14.3
Mental health nursing specialization	1	7.1
Community health nursing specialization		
Higher academic degree	11	78.6
Bachelor's degree (4 years)	3	21.4
Master's degree (4 + 2 years)		
Experience as a Nurse	4	28.6
10–19 years	10	71.4
> 20 years		
Experience as a Nurse at PACU	3	21.4
< 10 years (10–19 years)	7	50
> 20 years	4	28.6

outcomes, (5) cognitive performance impairment, (6) incivility, (7) core competence vagueness of PACU nurses, (8) high-tech care, (9) (in)security and risk, (10) occupational stress. The steps of Colaizzi's phenomenological data analysis are presented in the [supplementary file 1](#). Figure 1 presents the emergent themes and the cluster of themes mentioned above.

Emergent Theme 1: Ambiguity/Decision Latitude

Participants highlighted the problems in the decision-making process between two or more possible options and the subjective assessments that can be biased or influenced.

"Uncertainty conditions reasoning. When you are managing the unit, you try to distribute a less complicated patient when a colleague already has a complicated patient, who requires a great workload." P4

"They always need validation. This uncertainty is based on having security in a subject, on the perception of a medical diagnosis, and even a nursing one. Pain, for example. Sometimes there is an uncertainty of saying 'this patient is really in pain.'" P3

Emergent Theme 2: Communication

Uncertainty related with communication involves the disagreement that arises and increases the odds of a negative outcome, and the fear of being misunderstood.

"Communication is the basis of the possible solution or the possible minimization of uncertainty. Sometimes many conflicts and problems arise precisely because the communication is not as assertive or as structured as it should be. The information does not get there." P14

"If you are humbler in your search for knowledge, you can easily ask a younger colleague or ask questions with a younger colleague who you think is a reference. At the beginning, we can ask all kinds of questions, however incorrect or absurd they may seem. The further forward it goes, the harder it becomes. Sometimes there are no opportunities to ask questions. When you have to do it, they demand it from you! In an emergency context, there is not much room to think about what to do. You have to act fast." P2

Emergent Theme 3: Work Ethic

The participants considered as work ethic that nurses employ in clinical practice a form of weighing the risk in which an action will hurt a patient against its potential to improve the clinical condition. This issue includes responsibility towards the patient (ensure safe care), and responsibility as a professional: competence and morality recognized by nurses to correct course of action to follow, regardless the objective of their intervention.

"Having the notion that I may not be doing everything I should and how I should do it, really disturbs me. Knowing that my actions can result in something negative for the patient is completely against my basic principle of trying my best to do my part in helping the patient to go through that process in the most serene, peaceful way possible, and ensure that everything useful and necessary for the patient's maximum benefit has been done." P6

Emergent Theme 4: Difficulty Interpreting and Predicting Outcomes

Participants revealed difficulty interpreting and predicting outcomes when a clinical situation is characterized by a high degree of

UNCERTAINTY EXPERIENCES IN NURSES 'CLINICAL REASONING'



Figure 1. Uncertainty experiences in nurses' clinical reasoning emergent themes, and cluster of themes. This figure is available in color online at www.jopan.org.

uncertainty, and when complex and rapid priority care management is mandatory for patients with multi-organ failure.

"There are situations where we try to intervene and there are some situations where the situation is irreversible. We must be aware of this. We cannot always be sure that this is possible." P8

"When you have a patient with a major surgery, critical, with ventilatory support, with amine support, you have to weigh it very carefully. You have to see the risk/benefit, because there is uncertainty. I am going to do complete hygiene, massage, and put the patient in a comfortable position. If I am 100% sure that I am not going to make anything worse, I will do so. Critically ill patients, I am not 100% sure." P13

Emergent theme 5: Cognitive Performance Impairment

Cognitive performance impairment was described by participants as a restriction of the rationality of optimal decision-making by the cognitive limitations of the decision-maker, and the unconscious neuroception.

"I think this uncertainty is not talked about between us. But the fact that nurses do not care about certain kinds of things, reveals a lot of that uncertainty. I think people react too benignly." P10

"There are also these three types of nurses: those who learn to manage such a situation of uncertainty and the consequences that behavior brings, which later create new problems; and those that continue to insist and do what they think is more correct. Then there are other nurses who give up a little bit because they think that the hassle they sometimes have does not make up for the result afterward." P12

Emergent Theme 6: Incivility

Participants report incivility in unacceptable and unethical practices based on authoritarianism and asymmetry of power and mistrust.

"I acknowledge people who do not humiliate and who share their knowledge. Those who enrich the other colleagues and provide care in a pedagogical way. People who have knowledge and help us pedagogically to reduce our uncertainty. We end up feeling better by questioning these people because we feel that we are not subjected to humiliation. Instead, they help us in our acquisition of knowledge and training." P1

"Some time ago, this was a sign of incompetence. You may be competent, but you are not competent in everything. Neither you nor anyone else. There were those who knew everything and others who did not know anything." P11

Emergent Theme 7: Core Competence Vagueness of PACU Nurses

The misconceptions that diminish the importance of the other's competencies, and the ill-defined roles that constrain effective interprofessional collaboration, were described as contributors to the vagueness of the core competencies of PACU nurses.

"Given the danger to the patient and trying to find some objectivity in my subjective analysis, for example, arguing with the doctor when he was willing to send a patient away from the unit and that in the face of a certain sign of danger justifies keeping the patient in our care." P6

"It is more a matter of a person not knowing what they have in institutional and organizational terms. It is more about that than the work itself." P10

Emergent Theme 8: High-Tech Care

The difficult compliance of health care providers related to high-tech market news, and the poor access to best evidence and guidelines, were referred by participants as uncertainty related with high-technology care.

"We have all types of patients, with all types of pathologies, with all types of procedures. And sometimes not all of us are always prepared to meet these new challenges. Sometimes there are new procedures, done here, that we are not used to. Sometimes we do not know the material well. There are situations where we have doubts." P8

Emergent Theme 9: (In)Security and Risk

The aspects related to safety and risk management listed by the participants were: the situations of clinical underestimation, the discrepancies between practice and evidence-based practice, and the delayed awareness related to signs and symptoms of surgical or anesthetic complications.

"I think that many times, it is a bit of 'guessing' and not scientific research or the search for certainties. Proven certainties, recognized and accepted by the scientific community. I think it is a bit I have been doing it this way for 20 years'. I think this happens a lot, quite often. More than would be desirable." P9

"You have a neurosurgery patient who comes in and you are settling the patient in and everything is ok. Suddenly an intracranial hemorrhage occurs, and you have no control, except in the vital parameters, blood pressure, which you can alert. Your action is fundamental. When you get to the critical part, cardiac arrest or precordial arrest, if you haven't warned, haven't approached, or haven't insisted, then it is your failure. You keep showing all the critical signs and if they do not pay attention to them, you have your action limited." P11

Emergent Theme 10: Occupational Stress

Participants considered occupational stress related with the maintenance of the professional image in front of the multidisciplinary team.

"There are some people who are more aggressive when detecting an error or if they cannot communicate well the most correct way to act in a given circumstance, which inhibits others from clarifying doubts. I think that moments of frank sharing, in which people can feel like equals, despite diverse knowledge, experiences, and skills, which are in fact at the same level of discussion, can only bring benefits. Knowledge dies if we do not share it. Unfortunately, many people, for self-protection of the image they want to convey, end up not being able to share everything they know, everything they have experienced. Ultimately, it turns out to be harmful for the team and for the patients." P6

Discussion

Ten themes emerged for the phenomenon of experiences of uncertainty in the clinical reasoning of nurses in the PACU. The results of the study show that the structure of the phenomenon is complex, multifactorial, and of great relevance for nurses, such as the narratives' richness. This demonstrates the holistic and comprehensive understanding of the phenomenon gained by using Colaizzi's method.

The quality of information used to support decision-making is hardly ideal. Many decisions are made under conditions of uncertainty, resulting from ambiguous or conflicting information.¹⁹ This aspect becomes more pressing when there is conflicting information,²⁰ referred to as entries from multiple sources that disagree with each other (eg, when clinical practice disagrees with evidence-based practice). Also, in decision-making process dilemmas, there is a greater aversion to conflict information than ambiguous information because of their outcomes' perception. This is consistent with our findings, as contradictions and the inability to control all variables are included in the information conflict. Additionally, the participants denoted decision latitude related to the ambiguity of the subjectivity evaluation. Thus, behavior in the face of uncertainty may change according to the chance of a desirable outcome of an ambiguous or conflicting alternative compared with an equivalent risky alternative.

Ineffective communication in care theater can lead to conflicts between health care providers. Conflict management in a perioperative environment can involve recognizing and self-managing emotions during conflict, improving the team's active listening skills and collaborative problem-solving.²¹ Participants mentioned conflict management and clarifying doubts related to communicational uncertainty. This identification of potential areas for improvement and the stimulus for change can be seen as a developing competency, which results in employability, greater job satisfaction, and stronger working relationships.²² The miscommunication becomes even more prominent when approaching the handover in the PACU. In Servas and colleagues' research,²³ the cocreation and implementation of an instrument for a standardized transfer allowed information loss reduction, handover quality improvement, and satisfaction increase of the perianesthesia nurses. Ultimately, it can mitigate patient safety events. Normalizing uncertainty can be an effective strategy to mitigate communication problems.²⁴

Also, patient safety relates to ethical work. It means that health care providers are doing their best to provide safe care. Insufficient time, too many priorities, and insufficient resources are listed as barriers to leading a safety culture.²⁵ Nurses must learn to successfully advocate for safe care and professional work environments. Notwithstanding, nurses may experience compassion fatigue, defined as emotional, physical, and spiritual depletion related to secondary trauma exposure.²⁶ The overwhelming patients' experience countertransference is associated with impacts on work quality, nursing retention, and turnover.

Caring for the person in the PACU clinical setting is a challenge for the health care providers. The potential complications and the latency of adverse events contribute to the difficulty of interpreting and predicting outcomes. The results of this study elucidate the complexity related to the recognition of clinical deterioration, postanesthesia complications, and critical care management. Missed or delayed diagnoses are a commonly contributing factor to postanesthesia severe outcomes.²⁷ Findings validate the need to maintain a high index of suspicion for complications in a setting where most patients may follow unpredictable paths. If nursing practice runs into absolute uncertainty, it is important to identify professional humility. Professional humility is defined by three essential components: being aware of our degree of uncertainty, being honest about what we can do within the limits of our competence, and admit the relevant motivational components.²⁸ Admitting our ignorance critically is challenging, but professional humility requires it.

Uncertainty can be aversive, cause fear, worry and anxiety, increase the perception of vulnerability, and avoidance of decision-making.²⁹ Moreover, it is often most ineffectively addressed because of the extreme cognitive and emotional demands.⁴ In our study, the participants' cognitive performance impairment was associated

with demotivation. Motivation is based on a cognitive-behavioral cycle, in which individuals guide their behavior based on goals and also how they assign value to it (whether something is worthwhile or not), which triggers motivated behavior.³⁰ Demotivation can be bridged by conveying safety and confidence, a sense of usefulness and competence. Perhaps, nurses in PACU can ameliorate the effects of uncertainty perception limitation, namely cognitive blocking, awareness default, demotivation, deresponsibilization. By becoming aware, nurses take an active role in their accountability.

The promotion of a civility culture is crucial for healthy work environments and safe care. However, 83% percent of nurses report incivility in health care.³¹ Nurses' workplace ambience disruption, frequently reported in medical-surgical wards and in intensive care units, were associated with poor patient safety culture perceptions.³² Chaotic situations, unpredictable conditions, stressful atmospheres, and limitations in the processes for evaluating the effect of interventions and care can expose nurses to incivility.³³ These conditions are equally present in the PACU clinical setting. Additionally, feelings of powerlessness in the workplace increase internal senses of ineffectiveness, reduce job satisfaction, increase levels of burnout, and intensify feelings of self-resignation.³⁴ This relates to the participants' narrative linked to professional discredit, condemnation, and disrespect for individuality.

In the care systems where there is physician dominance, nurses' perceived reduced autonomy and their perceived psychological empowerment affect the work environment and professional practice.³⁴ This aspect is also emphasized by the participants regarding the hegemonic biomedical background and, consequently, for the disbelief in nurses' skills. Wang and Liu³⁵ emphasized that psychological empowerment is positive both for work engagement and motivation and for creating a healthy occupational environment. Also related to PACU nurses' skills, Dahlberg and colleagues³⁶ survey identified six countries where perianesthesia nursing has been recognized as a professional nursing specialty and eight countries where national standards for nursing practice were established. Although no entity related to Portuguese perianesthesia nursing participated in this study, the competencies of perianesthesia nurses in Portugal are similar to those presented in Canada, United States of America, and Greece. However, despite being recognized as a professional nursing specialty in the country by the governance board, no established national guidelines or standards of practice are issued internally, and there is no formal education for the nurse working in PACU. This underlines the concern regarding the vagueness of the core competence of nurses in PACU, mentioned by the participants. This international survey will allow the knowledge collected to be used to develop continuous education and training for PACU nurses. According to the authors, the partnership will strengthen nursing practice, identifying common denominators that characterize postanesthesia nursing.

High-tech care and technology offers new modes for health support and patients' connection.³⁷ To keep up with technology in constant evolution, it is urgent to adapt and be willing to change what does not diminish the value of our skill but improves it. Making an effort to follow the evidence and look for ways to blend new innovations with the face-to-face skill set is necessary. Additionally, to achieve high-quality care and increase productivity, the organizational structure should care for its employees by creating internal opportunities, access to resources and information, training and education.³⁴ Our results are consistent with this, in which the uncertainty associated with asymmetric accessibility to the best evidence is referenced.

Perceived competence influences uncertainty tolerance. The manifestation of reluctance toward an uncertain outcome is diminished when there is awareness that the risks in question are unknown not only to self, but to all individuals, that is, it is

L.D.M. Cunha et al.

Journal of PeriAnesthesia Nursing 39 (2024) 409–416

unknownable.³⁸ This becomes pressing in the new or unusual situations in the clinical setting described by the participants. (In)security and risk is also noticeable in the normalization of the risk that nurses take and how nurses have become heroic role model, namely during the COVID-19 pandemic. The perpetuation of the narrative of nurses' self-sacrifice,³⁹ linked to the nursing epistemological root should contemplate a contemporary view that 'the real hero is one who advocates for patients, acts compassionately, and articulates with knowledge and reason'.^{p.318}

Occupational stress and burnout are increasingly recognized in the field of anesthesiology professionals.⁴⁰ On one hand, patients are progressively complex and new anesthetic technologies and techniques are rapidly being introduced. On the other hand, there is greater awareness of the discussion of the experience of occupational stress and related mental health problems, such as burnout. High workload, low decision latitude, poor social climate/social support, poor leadership, time pressure, high work demands and low rewards, role conflict, low autonomy, negative nurse-physician relationship, and job insecurity are identified as predictors of burnout.⁴¹ These aspects are also highlighted in the findings of this study, and it is important to analyze them to mitigate their impact. Among the outcomes of burnout and occupational stress, reduced job performance, poor quality of care, patient safety, adverse events, negative patient experience, medication errors, infections, patient falls, and intent to leave⁴¹ were found. The patterns identified by these studies consistently show that the adverse characteristics of the workplace have potential consequences for health care providers and patients. It becomes pressing to identify strategies that minimize the impact of uncertainty related to nurses' clinical reasoning to improve working conditions and patient safety.

Strength and Limitations of the Work

The participants included in the sample went through a wide variety of situations in which the phenomenon was experienced and provided rich data from the individual perceptual understanding of the phenomenon.

The maintenance of pure bracketing was challenging for the researchers. To ensure research trustworthiness, the phenomenon was observed in a curious and questioning way and described precisely, as did the participants. The use and meaning of terms and phrases were validated by the participants. The emergent themes are honest and transparent (reliability criteria). Also, the structure provided in Colaizzi's method of data analysis enabled transparency in this study.

This study was developed in a single PACU clinical context and at a particular level of postanesthesia care. Another limitation of the study involved nurses who met the inclusion criteria but did not express willingness to participate in the study. Nevertheless, an important factor to be considered for their selection is the interest in understanding the nature and meanings of their experiences.

Conclusion

Postanesthesia nurses may experience uncertainty related to the clinical reasoning process that involves decision-making. The assumption that nurses, regardless of experience and differentiation, can transfer skills and knowledge to any care situation, refuses to acknowledge the complex specific PACU clinical setting. This study offers a unique insight into the clinical reasoning uncertainty experiences from PACU nurses. The findings highlight the inadequate working conditions for the nurses' well-being, the technical-scientific unpreparedness that interferes with the cognitive process of nursing reasoning, and the interpersonal/multidisciplinary dynamics that condition shared decision-making.

Acknowledging how nurses perceive this phenomenon and understanding its fundamental structure is pivotal to informing best practice and, in that sense, enables to identification potential improvements in nursing practice that minimize the impact of uncertainty. By making experiences of uncertainty explicit and tangible, nurses can identify more adaptive responses to uncertainty and enhance their clinical reasoning accuracy. Since perianesthesia nurses' core competencies include advocating for the quality and safety of care, uncertainty awareness must be incorporated as a commitment.

Ultimately, nurses must determine for themselves how to convert their experience of uncertainty into their clinical practice, by recognizing the humility, flexibility, and courage to tolerate it.

Declaration of Competing Interest

All authors declare no conflicts of interest.

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Supplementary Materials

Supplementary material associated with this article can be found in the online version at doi:10.1016/j.jopan.2023.08.024.

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L.D.M. Cunha et al.

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Supplementary Materials

Supplementary File 1 - Data analysis following Colaizzi's Phenomenological Method

Examples of Significant Statements	Formulated Meanings	Cluster of Themes	Emergent Theme
'Uncertainty conditions reasoning. When you are managing the unit, you try to distribute a less complicated patient when a colleague already has a complicated patient, who requires a great workload.' P4	A problem in the decision-making process between two or more possible options	Decision-making process dilemmas	Ambiguity and Decision Latitude
'We have procedures that depend on others. It costs me a lot, and I don't know if we'll be able to do that, saying 'No, I don't do it because that's not the algorithm! Isn't it?' P8	Individual practice versus evidence-based practice	Clinical prescription contradictions	
'Maybe the best way is to understand what the theoretical basis of a certain procedure is, and then try to follow the best practices and procedures as correctly as possible. Even doing all of this steps, there may be situations that get out of control.' P6	A factor that is not regulated or measured by the nurse during practice	Inability to control all variables	
'This uncertainty basement on having security on a subject, on the perception of a medical diagnosis and even a nursing one. Pain, for example. Sometimes there is an uncertainty of saying 'this patient is really in pain'. P3	An assessment or evaluation that might be biased, opinionated, or influenced (eg, pain assessment, state of consciousness alteration, patient compromised communication, hetero assessment instruments	Subjectivity evaluation	Communication
'Communication is the basis of the possible solution or the possible minimization of uncertainty. Sometimes many conflicts and problems arise precisely because the communication is not as assertive or as structured as it should be. The information does not get there.' P14	A disagreement that arises and increase the odds of a negative outcome	Conflict management	
'Although we try to collect as much data as possible, there are situations where the colleagues in the operating room say 'There comes a patient who has undergone a carotid endarterectomy'. But they forgot to say that the patient was very unstable.' P4	Suboptimal or miscommunication of clinical information	Handover	
'If you are humble in your search for knowledge, you can easily ask questions a younger colleague, who you think is a reference. At the beginning, we can ask all kinds of questions, however incorrect or absurd they may seem. The further forward it goes, the harder it becomes.' P2	The fear of be misunderstood	Embarrassment of clarifying doubts	Work ethic
'Knowing that my actions can result in something negative for the patient is completely against my basic principle of trying my best to do my part in helping the patient to go through that process in the most serene, peaceful way possible, and ensure that everything useful and necessary for the patient's maximum benefit has been done'. P6	Consideration that nurses employ in clinical practice to weigh the risk that an action will hurt a patient against its potential to improve the clinical condition	Concern about not causing harm to the person cared for	
'I became more awake to the situation; I almost did not leave the patient. While I saw that the physician was not seeing what I was seeing, because I was not finding it normal. While he was saying 'okay, let's see'. P7	Nursing engagement in actions that effect a desired change in any level of patient care	Advocate for the person cared for	
'There are situations where we try to intervene and there are some situations where the situation is irreversible. We must be aware of this. We cannot always be sure that this is possible.' P8	When a clinical situation is characterized by a high degree of uncertainty	The unknown/absolute uncertainty	Difficulty interpreting and predicting outcomes
'The degree of uncertainty was. I was very honest with her. I told her that the situation was very complicated and that we were doing everything in our power. She was there, in a situation where she might have to go to intensive care because of the sepsis.' P1	An unmeasurable behavior demonstrated by the patient responsive to nursing interventions	Nursing intervention outcomes	
'There are situations that touch us deeply. Young people in terminal situations, that we know that no matter how much we do, it will never be enough. That makes me very frustrated, makes me angry with life.' P7	Addressing the impact of serious illness that cannot be cured	Palliative care/end of life care	
'And trying to understand when can my subjective analysis, given the danger to the patient, find some objectivity, for example, to argue with the doctor that he was willing to send a patient away from the unit and that in the face of a certain sign of danger justifies keeping it in our care.' P6	Defining attributes, antecedents and consequences identified led to an operational definition of clinical deterioration as a dynamic state experienced by a patient	Early recognition of the potential for clinical deterioration and clinical instability factors	Precardiac arrest situations
'Recently there was a situation of respiratory arrest. When I arrived it was a big mess, everybody was in charge. It was chaotic. I asked the anesthesiologist who was in charge, and what was going on, there was no leadership. Afterwards, there was a division of roles, things went well, but I felt that I arrived at the right moment.' P14	Life-threatening situation where in the patient could suffer significant harm without rapid or immediate therapeutic and/or diagnostic	Precardiac arrest situations	
'We make a difference in the vigilance that we have, in the knowledge that we have in relation to the immediate post-operative period. We have a tight surveillance, and we end up making a difference because many times we are the ones in the first line and we notice the situations, the alterations that may cause some damage.' P13	Unintentional clinical problems which arise as a result of surgery and/or anesthesia	Postanesthesia complications	
'When you have a patient with a major surgery, critical, with ventilatory support, with amine support, you have to weigh it very carefully. You have to see the risk/benefit, because there is uncertainty. I am going to do complete hygiene, massage, and put the patient in a comfortable position. If I am 100% sure that I am not going to make anything worse, I will do so. Critically ill patients, I am not 100% sure.' P13	Complex and highly specialized nursing care for patients with multi-organ failure requiring complex and rapid priority management	Critical care management	

'I think this uncertainty is not talked about between us. But the fact that people do not care about certain kind of things, reveals a lot of that uncertainty. I think people react to benignly.' P10	Restriction of the rationality of optimal decision making by the cognitive limitations of the decision maker	Uncertainty perception constraint	Cognitive performance impairment
'It can be a stressful situation that leads you, in a similar situation, not wanting to act or unconsciously blocking. You can have the escape or fight. It depends on your personality, with your intrinsic factors, with what you want with your profession. Some days you are more tired, you have more shifts, you may have an external locus of control at that moment.' P13	A temporary inability to continue or complete a train of thought	Cognitive block	
'There are also these three types of nurses: those who learn to manage such a situation of uncertainty and the consequences that behavior brings, which later create new problems; and those that continue to insist and do what they think is more correct. Then there are other nurses who give up because they think that the hassle they sometimes have does not make up for the results afterwards.' P12	Unconscious neuroception	Awareness default	
'The motivation to search is not always the same. Some days yes, some days not. And more and more are prevailing the 'no' days.' P13	Lack of interest, difficulty to engage in activities, complete tasks or interact with others	Demotivation	
'It is easier to say that there is no plan, that the anesthesiologist didn't ask for blood gas. It is easier to say I didn't question what the plan is. Even in terms of positioning no action was taken. I assertively questioned the colleague, and the answer was dubious: 'this is complicated, everything is delayed'.' P14	Progressive dilution or denial of responsibilities	De-responsabilization	
'I acknowledge people who do not humiliate and who share their knowledge. Those who enrich the other colleague and provide care in a pedagogical way. People who have knowledge and help us pedagogically to reduce our uncertainty. We end up feeling better by questioning these people because we feel that we are not subjected to humiliation. Instead, they help us in our acquisition of knowledge and training.' P1	Perverse and unethical practices, based on authoritarianism and power asymmetry	Moral harassment	Incivility
'I think people deal with uncertainty situations very differently, within the personality of each one. Not only in experience, not only in knowledge but it also has to do with each person's personality. There are some who, to stand out, focus their attention on the things they have done well or try to divert what they have done to put faults on the things that others have done.' P8	Violation of the person's intersubjective expectation	Disrespect for individuality	
'Some time ago, this was a sign of incompetence. You may be competent, but you are not competent in everything. Neither you, nor anyone else. There were those who knew everything and others who did not know anything.' P11	Mistrust or cast the accuracy into doubt	Professional discredit	
'There are some people who are more aggressive when detecting an error or if they cannot communicate well the most correct way to act in a given circumstance, which inhibits others from clarifying doubts. I think that moments of frank sharing, in which people can feel as equals, despite diverse knowledge, experiences, and skills, which are in fact at the same level of discussion, can only bring benefits.' P6	Moral indignation and distinction of superiority over the other	Condemnation culture	
'It has to be based on the best scientific evidence; it can not be based on individual belief. Sometimes there are people with a lot of power to make decisions, to authorize or desert certain kinds of initiatives, who base those decisions on their own beliefs and their own perceptions without involving the people at the bottom.' P6	Dysfunctional relationships that influence interpersonal functioning	Dependency/influence/conditioning relationships	
'It is facing situations where I even know and I have experience, but other colleagues do not validate my knowledge at all.' P10	Misconceptions that diminish the importance of the other's competencies	Nurses' skills misbeliefs	Core competence vagueness of post-anesthesia care unit nurses
'It is more a matter of a person not knowing what they have in institutional and organizational terms. It is more about that than the work itself.' P10	Ill-defined roles that constrain effective interprofessional collaboration	Lack of clarification of the nurse's role in the team	
'I find it surreal when anesthesiologists condition the nurses. Because there are little things that are very important, that we can do, so that when we get to the medical decision, they already have many more elements to base their decision.' P11	Dominance of the biomedical model, the active suppression of alternatives, and the corporatization of medicine-centeredness	Historical biomedical hegemony	
'We have all types of patients, with all types of pathologies, with all types of procedures. And sometimes not all of us are always prepared to meet these new challenges. Sometimes there are new procedures, done here, that we are not used to. Sometimes we do not know the material well. There are situations where we have doubts.' P8	Market news with the potential to challenge compliance in health care providers	New materials/drugs/techniques	High-tech care
'Increase training. I know this is complicated and time management has not been easy at all, but in our clinical context it is essential. And not everyone, me included, wants it. I do not want to, it is not my goal to have a lot of time off, to have training outside of work. And I think that the in-service training must be used for this. I have been in the unit for 9 years and I have never taken an advanced life support course!' P13	Poor access to best evidence and guidelines, and low nurse adherence to evidence	Asymmetric accessibility to best evidence	

'Because if you go by ABCDE, our practice is very safety-directed at the care level. A is OK, but B it is not. You must do that momentary triage, which is difficult, in a matter of seconds.' P12	Time that mediates the stimulus and the action	Scheduled situations vs urgent/emergent clinical situations	(in)Security and risk
'A patient complains of back pain after having undergone a gallbladder surgery: what is the diagnosis you make? Maybe it is referred pain. What communication am I going to have with the anesthesiologist? 'I think it is a referred pain because the innervation and the nerve fields are the same. What attitude am I going to have? I will do a massage, position the patient, which is an autonomous nursing intervention. Or I will immediately tell the doctor 'look, this is a referred pain, maybe you'd better take a painkiller right away', P12	A rare presentation of a common condition	New or unusual situations in the clinical context	
'On an emotional level, it always has to do with cases that are more related to your life. We work with people, people have families, we have families, and there are situations that are similar to our life. 'Damn, if he were my son'. Sometimes, it is very hard emotionally.' P13	Influence of the similarities of the content of emotional experiences	Mirroring/similarity to personal experiences/emotional involvement	
'When the assessment is based on subjectivity or individuality, either of the patient or the nurse, such as pain, it is very difficult.' P12	Clinical variation on health care processes or outcomes, compared to peers or to gold standards such as evidence-based guidelines recommendation	Variability in clinical practice	
'I think that many times, it is a bit of 'guessing' and not scientific research or the search for certainties. Proven certainties, recognized and accepted by the scientific community. I think it is a bit 'I have been doing it this way for 20 years'. I think this happens a lot, quite often. More than would be desirable.' P9	Predictable labor process and no innovation ruptures, amorphous social movement	Routinization/crystallization in care delivery	
'It is important not fall in the laxity and common sense'ism.' P9	Devaluing situations, removing their absolute or independent character, and making a brief and unstructured analysis	Facilitation/relativization	
'I have changed my theoretical and practical framework many times. Science also changes. Sometimes you only realize after a few years that things had already changed before and are only being applied now.' P12	Discrepancies between practice and evidence-based practice that might compromise or be perceived to compromise the quality of care	Perpetuation of errors by outdated knowledge	
'Contact the pharmacy, try to get protocols. These alternative strategies change the result. It is the difference between doing it the right or wrong way. If a prescription raises doubts and is ambiguous, we must make sure that it is done correctly. The duration of infusion, pharmacodynamics, stability.' P2	Potential or effective patient safety threatening situations related to drug administration	Pharmacology prescription errors and near miss	
'You have a neurosurgery patient who comes in and you are settling the patient in and everything is ok. Suddenly an intracranial hemorrhage occurs, and you have no control, except in the vital parameters, blood pressure, which you can alert. Your action is fundamental. When you get to the critical part, cardiac arrest or pre cardiac arrest, if you haven't warned, haven't approached, or haven't insisted, then it is your failure. You keep showing all the critical signs and if they do not pay attention to them, you have your action limited.' P11	Retarded awareness related to signs and symptoms of surgical/anesthetic complications	Delayed diagnosis of postanesthesia complications	
'Our unit is undersized. This is problematic for the decisions making. Not only for nursing, but it also generates uncertainty for physicians and all the people who must participate in the unit management, and in this attempt to respond to those who are here and those who will come. Because everyone needs and benefits from the right time in the PACU and unfortunately and inevitably there are always shortages when supply is less than demand.' P6	Deficit between logistical, human, and technical conditions and the demand for health care	PACU overcrowding	Occupational stress
'Care management is the biggest challenge. Because the solutions sometimes fall short, and I might have to try to protect the most vulnerable nurses.' P14	Health care planning patient-centric, related to nurse workload adjustment	Care management	
'I was the oldest member of the unit at that time. I felt that, although the nurses who were with me were also already experienced, I felt that in the face of that chaos, someone had to take the reins.' P10	Leader's methods and behaviors when directing, motivating, and managing others	Leadership style	
'We are in charge of a critical ill patient and, at the same time, have to respond to another patient in an early phase of anesthesia recovery. These are variable complexities, whether in relation to the surgical procedure, the reaction to anesthesia, or the individual's condition. There are many challenges, with very different levels of complexity and demand that can generate stress and ultimately trigger uncertainty.' P6	Management skills to focus on the right tasks and ultimately deliver the expected outcomes	Priority management	
'In a certain context, which goes up to a great level of adversity, I think people manage reasonably well this insecurity and uncertainty. But sometimes that limit is exceeded. People realize that they are not working well, that they cannot comply with good practices exactly because they are working in an excessive way, insecurely, and with some degree of uncertainty. Working on the edge is never ideal. We are working on the edge, with a lot of pressure, many times.' P6	The amount of work (or load) that nursing care imposes	Workload	
'Knowledge dies if we do not share it. Unfortunately, many people, as a matter of self-protection, of the image they want to convey, end up not being able to share everything they know, everything they have experienced. Ultimately, it turns out to be harmful for the team, for the patients.' P6	The 'image' transmitted to the multidisciplinary team. The feeling of falling short of your skills and abilities	Personal feeling of control loss	

MANUSCRITO 3: Barriers and facilitators to managing uncertainty in nurses' clinical reasoning in post-anaesthesia care units: a qualitative thematic analysis

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Barriers and facilitators to managing uncertainty in nurses' clinical reasoning in post-anaesthesia care units: a qualitative thematic analysis

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ABSTRACT

Objective: To describe and analyse barriers and facilitators to managing uncertainty in nurses' clinical reasoning in post-anaesthesia care units.

Background: The diagnostic process in complex clinical settings often involves uncertainty. This can bias clinical reasoning and compromise the safety of healthcare. Still, little is known about how nurses deal with uncertainty in their clinical practice.

Study design and methods: This study employs a qualitative descriptive design. Fourteen nurses working at a post-anaesthesia care unit were selected through convenience sampling. Data was collected through semi-structured interviews and analysed using thematic analysis. The deductive analysis was undertaken based on the Theory of Reasoned Action. This study followed the Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist.

Results: Two major themes emerged from the analysis: 'barriers' and 'facilitators'. Each major theme aggregated four themes: intention to perform the behaviour, attitudes, subjective norms, and external variables.

Discussion: The perceptions of barriers and facilitators provide valuable insights into current and desired practices that can help minimise uncertainty in nurses' clinical reasoning in post-anaesthesia care units. They provide knowledge and future direction for clinical practice improvements by addressing motivations for reasoning behaviour. The need to create more nurse-friendly working conditions and reduce the cognitive and emotional impact of uncertainty was also identified.

Conclusion: This study provides a comprehensive list of barriers and facilitators of uncertainty management in clinical reasoning based on nurses' perceptions. Recognising behaviours based on reasoned action is essential to manage uncertainty in nurses' clinical reasoning.

RESEARCH ARTICLES

Implications for research, policy, and practice:

These findings can be used by different stakeholders to better manage uncertainty in healthcare settings. They are valuable resources for health professionals, researchers, and healthcare institutions attempting to improve health practices and enhance safety in health services.

What is already known about the topic?

- The safety and quality of post-anaesthesia care is highly influenced by the clinical reasoning of healthcare providers.
- In complex clinical settings, such as post-anaesthesia care units, uncertainty in clinical reasoning is common and expected.
- Identifying barriers and facilitators of clinical reasoning is essential to support nurses cope with uncertainty in post-anaesthesia care units.

What this paper adds:

- Embracing uncertainty as an opportunity for personal and professional development is a facilitating factor.
- The barriers to managing uncertainty are related to individual personality characteristics and the nature of interpersonal and professional relationships.
- Maladaptation to uncertainty in clinical reasoning has a major impact on nurses' wellbeing in post-anaesthesia care units.

Keywords: Clinical reasoning, clinical decision-making, patient safety, post-anaesthesia nursing, postoperative period, uncertainty

BACKGROUND

The immediate postoperative period carries a significant risk of severe complications. Missed or delayed post-anaesthesia diagnoses were cited as contributing factors in 56.3% of cases resulting in the death of a patient.¹

Postoperative care is complex and involves making decisions in critical situations. The healthcare providers' ability to provide safe and appropriate care is dependent upon their clinical judgment and decision-making skills.² Controlling risks, planning care, and having adequate clinical reasoning skills are essential to maintain patient safety.³

Clinical reasoning is the process of applying knowledge and expertise to a clinical situation to develop a solution and manage a clinical problem.⁴ Although it is considered a core competence in clinical practice, clinical reasoning has been addressed as either a multifaceted construct or a 'black box' phenomenon.⁵ Decision-making depends on cognitive inputs from highly trained healthcare providers. Those cognitive inputs fall short of what clinical practice requires. The complex information process is under severe uncertainty, and the inevitable outcome is that decisions too often cannot be justified based on available knowledge, risk, cost, benefit, or patients' desires.⁶

A review, employing the Model of Uncertainty in Complex Healthcare Contexts (MUCH-S) taxonomy, considered uncertainty in nurses' clinical reasoning in Post-Anesthesia Care Units (PACU), examining it from personal, practical and scientific perspectives. The findings highlight an appreciation of nurses' intuitive reasoning, the perceived knowledge gaps and clinical (in)experience, providing valuable insights to inform and improve clinical reasoning in post-anesthesia settings. A review explored uncertainty

in nurses' clinical reasoning under uncertainty in Post-Anaesthesia Care Units (PACU) from a personal, practical, and scientific perspective using the Model of Uncertainty in Complex Healthcare Settings (MUCH-S) taxonomy.^{7,8} Another study offered archetypes applicable to various health ecosystems and proposed an overarching model of different types of uncertainty that demonstrated their interrelatedness in health systems.⁹ Moreover, Kalke and colleagues *underscored* the necessity for a more in-depth exploration of healthcare providers' encounters with uncertainty and highlighted challenges in researching uncertainty communication, particularly emphasizing probability, scientific issues, and patient experiences.

Clinical reasoning is an interpretive practice, and it consists of several processes. It is an intrinsically contextual clinical competence that develops with practice, reflection on experience, response to knowledge retrieval capacity, and the organisation of thought during the hypothetical cause analysis.¹¹

The universal form of conscious behaviour is an action designed to change a future situation inferred from a present one, which involves perception and twofold inference. Furthermore, we must infer what the future situation would have been without our inference, and what change will be wrought in it by our action. However, none of these processes are infallible, accurate, or complete. We do not infer the present as it is, and in its totality, nor do we infer the future from the present with a high degree of reliability, nor do we accurately know the consequences of one's own actions. In addition, actions are not always performed in the way in which they were imagined and desired.¹²

5 <https://doi.org/10.37464/2023.404.1120>

RESEARCH ARTICLES

In this sense, the Theory of Reasoned Action (TRA) intends to predict and understand intentional behaviour.¹³ It focuses on individuals' beliefs concerning the future performance of a given behaviour. The central construct is intention, a motivational determinant of behaviour. Intention reflects the extent to which an individual is likely to plan to make and invest efforts in pursuing a given behaviour. It is conceptualised as a function of two belief-based constructs: attitudes and subjective norms. Attitudes are polarised evaluations of performing the behaviour in the future, while subjective norms reflect beliefs that significant others would want them to perform the behaviour.¹³ According to the TRA, nurses' intentions are influenced by four subjective factors: their attitudes towards uncertainty management (i.e., their attitudes towards the behaviour), their perception of what other people would do (i.e., descriptive social norms), their perception of what others who are important to them would do (i.e. injunctive social norms), and their perception of whether they have the necessary internal and external resources to perform the behaviour (i.e., perceived behavioural control).¹³ Therefore, TRA seems relevant to describe nurses' attitudes and behaviours regarding barriers and facilitators to managing uncertainty in clinical reasoning, which may contribute to behaviour change.

OBJECTIVE

This study aims to describe and analyse the barriers and facilitators of uncertainty management in nurses' clinical reasoning in PACU. Given the current emphasis on safety and quality of healthcare, a careful understanding of the barriers and facilitators of clinical reasoning is essential to support nurses in PACU to manage uncertainty in complex clinical scenarios.

STUDY DESIGN AND METHODS

DESIGN

We conducted a descriptive exploratory study using a qualitative design. This study was designed to explore the underlying nature of the perceived barriers and facilitators of uncertainty management and uncover the full nature of the ill-defined phenomenon.¹⁴

The Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist was used to ensure a comprehensive report of the findings.¹⁵

PARTICIPANT SELECTION AND RECRUITMENT

Participants were recruited by email. The procedure was intentionally led by the head nurse to minimise personal bias in the recruitment. A pamphlet was sent by email describing the study, objectives, methods, and data collection techniques. Interested nurses contacted the first author who conducted further screening to verify their eligibility.

Convenience sampling was used to ensure maximum variation in demographic characteristics. The inclusion criteria were nurses who provided postoperative care in phase I in the adults polyvalent PACU,¹⁶ who agreed to participate in the study. As there is no specialisation in nursing anaesthesia in Portugal, all nurses working at the PACU were eligible regardless of their complementary training. Nurses in training/onboarding programs were excluded.

DATA COLLECTION

Data were collected using semi-structured interviews between April and May 2022. A pilot interview was undertaken with one participant to adjust the interview script and to refine the first author's interview skills. After the interview's transcription and discussion with the research team, no changes were made to the script. The pilot interview was included in data analysis.

After prior appointment with each participant, the interviews were conducted individually and took place in a meeting room of the anaesthesiology service, where privacy was guaranteed. All the participants were interviewed once. Only the researcher and the participant were present during the interview. All interviews were conducted by the first author, a female medical-surgical nurse specialist who also works in the PACU and who's a doctoral candidate. The interviewer discussed appropriate interview techniques and behaviours with the research team. Participants knew in advance the researcher's goals resulting from her academic studies. They reported no biases or pre-assumptions.

The interviews were audio recorded and lasted 30 to 64 minutes (mean 45 minutes). The semi-structured interview guide (Table 1) was developed based on the results of a previous literature review.⁷ Field notes were taken immediately after the interview to clarify speech pauses and write reflective memos throughout the research. Since the interview was conducted in European Portuguese, the interview excerpts were translated and back translated to ensure the original meaning was preserved.

TABLE 1. THE SEMI-STRUCTURED INTERVIEW GUIDE

Questions
1. What effects do you think uncertainty in clinical reasoning can have on nurses in the Post-Anaesthesia Care Unit? a) Do you consider it to be an irrelevant, stressful, or benign event? b) Do you consider it to be a harmful, threatening, or challenging event?
2. What are your thoughts and feelings when you experience uncertainty in nursing clinical reasoning? a) Describe the main cognitive, emotional, and behavioural challenges.

6 <https://doi.org/10.37464/2023.404.1120>

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Data saturation was reached with 10 interviews, which means that no new information emerged.¹⁷ However, the 14 nurses willing to participate in the study were interviewed to confirm the phenomenon of interest.

DATA ANALYSIS

The interviews were transcribed verbatim using Microsoft Word and returned to participants for validation. No requests for changes were received. The documents were stored in an encrypted file in Google Drive and later analysed using MAXQDA Analytics Pro 2022 software.

Data was analysed using deductive thematic analysis with a pre-identified theoretical framework: the TRA.¹³ Thematic analysis focuses on the perceived significance of ideas and how they connect practices, thus it is relevant to many perioperative concerns.¹⁸ It was considered the most appropriate and pragmatic method to understand nurses' experiences of uncertainty in complex settings.

Thematic analysis was performed following the six steps by Braun and Clarke.¹⁹ Phase 1, 'familiarisation with the data', consists of immersing yourself to become familiar with the depth and breadth of the empirical material collected through the interviews. Preliminary meanings and patterns were searched. In Phase 2, 'coding', codes were generated based on the theoretical framework's components, then data was classified into these predetermined theoretical relevant structures. From this stage onwards, two coders independently compared the analysis, identified points of convergence, divergence, and complementarity, and defined the coding guide. In Phase 3, 'searching for themes', data sets were coded and theme-organised using the coding guide arising from the theoretical framework. In Phase 4, 'reviewing themes', the themes were reviewed and refined by applying a hybrid interpretive/deductive analysis approach, that added interpretive patterns and themes to the coding guide. In Phase 5, 'defining and naming themes', the researchers involved in the initial coding and the other researchers (i.e., the independent reviewers) held two formal meetings to discuss discrepancies in data analysis and interpretation. Any discrepancies were resolved through a consensus discussion, to calibrate interpretations against each other or against baseline patterns. Additionally, the results were returned to participants to check for accuracy and resonance with their experiences. Phase 6 fulfilled the assumptions for producing the report. The results were the outcome of discussion and consensus among all authors.

RIGOUR

To ensure the rigorous criteria of qualitative research, were assessed the critical indicators of the TACT framework: (T)rustworthiness, (A)uditability, (C)redibility, and (T)ransferability.²⁰

Trustworthiness was ensured by the transparency of results generated by the participants, throughout the neutrality towards the phenomenon under study. The diversity of responses suggested the effectiveness of distinguishing between the role of colleague and researcher, which reveals the rational acceptance that participants felt comfortable sharing different points of view from the researcher. Consistency in data analysis was obtained through evaluation of intercoder reliability. The neutrality of the results was achieved through different perspectives.

Auditability was ensured by checking if the research process and the decisions taken within it were fully documented and described in the trail audit. Supervision, consciousness-writing, self-interviewing, and clarification of the insider-researcher role were means employed to overcome potential bias.

Credibility was ensured through several strategies: content validation to provide findings' feedback through member checking, where data are fed back to participants to ensure that the experiences described are recognised, and sustained engagement. The main researcher's dual role provided opportunities to address the ethical and practical issues, namely the longitudinal approach, which helped build rapport and trust with the participants, the familiarity, which facilitated understanding of the phenomenon, and the use of the 'hazarding' process, which reduced prejudices and clarified inconsistencies between narrative and behaviour.²¹ Self-reflection and a reflexive approach were necessary for the insider-researcher to be able to identify, construct, criticise, and articulate their positionality.²² Moreover, the researcher was also able to reduce the 'bureaucracy' required to engage with the participants, which enabled social interactivity. Plus, the researcher's deep familiarity with the cultural and political structure of the clinical setting provided a more in-depth understanding of the data, given the knowledge about the local reality. Data triangulation was used to identify the convergence of data.

Transferability was ensured by detailed descriptions to promote dependability of the procedure and data analysis, so that the readers can judge applicability in other contexts. Additionally, the contextual exploration related to the institutional mandate, the social mandate, and the conceptual structure of nursing allowed broader interpretations.

ETHICAL CONSIDERATIONS

The study was approved by the hospital's Ethical Committee (date:14/04/2022, registration code 260/CES). Participants gave their informed consent prior to the interviews. Confidentiality was ensured by allocating an alphanumeric identification (e.g., P1) to each participant.

RESEARCH ARTICLES

Cunha L, Pestana-Santos M, Lomba L, et al. • Australian Journal of Advanced Nursing 40(4) • 2023.404.1120

RESULTS

SOCIO-DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS

Most participants were female (71.4%), with a bachelor's degree in nursing (78.6%), and 7.14% were specialised nurses. The certification and job tasks of perianaesthesia nurses working in PACU differ across countries. The Netherlands, Ireland, and Australia are the only countries with formal education programs for perianaesthesia nurses.²³ As the qualification required of nurses to work at PACU is not formally required and defined in Portugal, some of the participating specialist nurses have a specialty outside the scope of the nurses' profile skills in the PACU. The socio-demographic characteristics of the participants are presented in Table 2.

TABLE 2. SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE PARTICIPANTS (N=14)

Demographic Characteristics	N (%)
Gender	
Male	4 (28.6%)
Female	10 (71.4%)
Age	
[30-39 years]	4 (28.6%)
[40-49 years]	7 (50%)
[50-59 years]	3 (21.4%)
Qualification	
Nurse Without Specialisation	8 (57.2%)
Medical Surgical Specialisation	3 (21.4%)
Mental Health Specialisation	2 (14.3%)
Community Health Specialisation	1 (7.1%)
Higher Academic Degree	
Bachelor's degree	11 (78.6%)
Master's degree	3 (21.4%)
Experience as a Nurse	
[10-19 years]	4 (28.6%)
[> 20 years]	10 (71.4%)
Experience as a Nurse at PACU	
[<10 years]	3 (21.4%)
[10-19 years]	7 (50%)
[> 20 years]	4 (28.6%)

MAJOR THEMES AND THEMES

Two major themes emerged from the hybrid interpretive/deductive analysis approach: 1) 'barriers' and 2) 'facilitators' to managing uncertainty in nurses' clinical reasoning in PACU – Figure 1. The following themes were identified: a) intention to perform the behaviour, b) attitudes (sub-themes: behavioural beliefs, evaluations of behavioural outcomes), c) subjective norms (sub-themes: normative beliefs, motivation to comply), and d) external variables (sub-themes: demographic, attitudes towards the event of uncertainty, individual traits). Given that the thematic

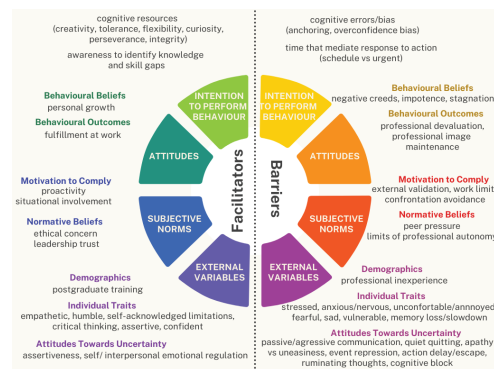


FIGURE 1. BARRIERS AND FACILITATORS TO MANAGING UNCERTAINTY IN NURSES' CLINICAL REASONING IN POST-ANAESTHESIA CARE UNIT

analysis was deductive and followed the assumptions of the TRA, the themes for barriers and facilitators were the same, with different codes distinguishing facilitators from barriers. A total of 51 codes were generated from the thematic analysis.

Barriers

The participants identified barriers to managing uncertainty in clinical reasoning in PACU based on their lived experiences.

Intention to perform the behaviour

Participants reported cognitive errors/biases (anchoring, overconfidence bias) in the intention to perform the behaviour as ineffective uncertainty management mechanisms. They reported that reaction times (scheduled versus urgent) influenced the response to a stimulus.

'I try to anchor myself in whoever is nearby. I have no problem in asking for help to minimise uncertainty.' P14

'The higher number of complex actions per unit of time, the likelihood of acting with uncertainty or insecurity. Even if a person is very confident in a given context, acting under pressure without being able to check whether good practices have been followed makes us feel insecure. If there is no time to go over this mental checklist, we might miss care.' P6

Attitudes

In the 'behavioural beliefs' sub-theme, participants identified negative creeds, impotence, and stagnation. In the 'evaluation of behavioural outcomes' sub-theme, nurses reported hiding their weaknesses to maintain their professional image. Professional devaluation was also listed as a barrier.

'As we do not want to convey an image of insecurity, uncertainty, or fragility, we end up making decisions alone, feeling unsure, which involves significant risk for the patient.' P6

RESEARCH ARTICLES

Subjective norms

In the 'normative beliefs' sub-theme, both professional interactions (peer pressure) and the limits of professional autonomy were identified.

'Each anaesthetist has their own agenda. I know the protocol, I know the algorithm, but then someone says: 'Oh no, we do it like this'. It confuses me. Do I follow the rules or the requirements?' P8

In the 'motivation to comply' sub-theme, the participants reported that they are influenced by the dependence on action/external validation needs, the work of limit/interdependence, and avoidance of confrontation.

'My perception is that nurses do not have the ability to argue scientifically. Some nurses stand up, while others just do what they're told. Which is even more serious, isn't it?' P10

External variables

In the 'demographic' sub-theme, the participants pointed out professional inexperience as a barrier.

'There are nurses with limited professional experience, and their uncertainty is even greater. I am worried that they might make some decisions on their own because they are afraid to ask questions or rely on older colleagues.' P14

In the 'attitudes towards the event of uncertainty' sub-theme, the participants reported barriers mainly related to emotional self-regulation: passive-aggressive communication, quiet quitting, apathy, event repression, action delay/escape, ruminating thoughts, cognitive blocking, behaviour of aggression, irritation, frustration, hyperreactivity, impatience, uneasiness, apprehension, projection, disappointment, and disorientation.

'Sometimes I am passive-aggressive. I send my messages subtly and sarcastically.' P13

'It does not slip my mind.' P14

'You know the guidelines, but it creates uncertainty when two patients get worse at the same time. It looks like incompetence! It makes no sense!' P4

In the 'individual traits' sub-theme, the following participant characteristics were listed as barriers: stressed, insecure, anxious/nervous, fearful/distressed, suffering/sad, uncomfortable/annoyed, vulnerable/weak, and memory loss/slowdown.

'Uncertainty, anxiety, insecurity, it is all related. The fear of failing and making clinical errors. The feeling of insecurity because you think you can't do it or you're not doing your best. Or even how the rest of the team feels about you. It always causes stress. These insecurities leave us increasingly vulnerable. On the one hand, we can try to overcome them with more theoretical support; on the other hand, we need positive reinforcements. And sometimes we may not even be

able to react, right? A series of negative feelings can lead us to stagnation, to giving up, to think it's not worth it.' P2

Facilitators

The participants identified facilitators to managing uncertainty in nurses' clinical reasoning in PACU. The facilitators were based on what the participants wanted to see happening in their clinical context (PACU).

Intention to perform the behaviour

The participants mentioned that awareness, the identification of knowledge gaps, and the use of cognitive resources (creativity, tolerance, flexibility, curiosity, receptivity, perseverance, reflection, integrity, concentration) could have a positive influence.

'The person is in a state of alert. I think this is it, but it may not be, so let me pay more attention, be more on top of it because if it's not this and it's something else, I have to take other measures to solve the problem in a timely manner.' P12

'Nurses who work for many years in PACU learn to deal with uncertainty and get used to not being right, to being flexible and tolerant. The big advantage is the flexibility.' P12

'It makes perfect sense to tackle uncertainty based on research, based on certainties. Fight uncertainty with certainty.' P9

Attitudes

Participants described personal development as 'behavioural beliefs.' In the 'evaluation of behavioural outcomes' sub-theme, the participants reported a positive impact of feeling that they have fulfilled their duty.

'We made it through that situation, we succeeded, and the outcome was positive for the patient. It boosts our self-confidence, our self-esteem.' P8

Subjective norms

In the 'normative beliefs' sub-theme, the participants reported their fear of causing harm to the patient and underlined the importance of leadership trust.

'I don't do certain tasks because I don't want to harm the patient by making a bad decision. Worsening the haemodynamic status, changing the breathing pattern, even exacerbating pain. So, I make a more careful and reasoned decision.' P13

Participants mentioned proactivity and not being directly involved in the situation in the 'motivation to comply' sub-theme.

'I can't recall ever having an in-service training in this unit. And that says a lot about what we intend to do for it. It is up to us to make these changes happen.' P9

RESEARCH ARTICLES

Cunha L, Pestana-Santos M, Lomba L, et al. • Australian Journal of Advanced Nursing 40(4) • 2023.404.1120

'I can think more clearly and confidently when I am not responsible for the situation. Uncertainty is less stressful. So, that uncertainty makes you grow. Whoa, I really didn't see it that way!' P13

External variables

In the 'demographic' sub-theme, the participants identified postgraduate training as a facilitator.

'The master's degree has broadened my horizons to how complacent we can be.' P9

Participants identified assertiveness and emotional regulation of others and self as facilitators in the 'attitudes towards the event of uncertainty' sub-theme.

'Maintaining safety, keeping a safe posture, speaking calmly, behaving calmly, avoiding running around, containing tics.' P3

In the 'individual traits' sub-theme, the following participant characteristics were identified as facilitators: empathy, humility/recognition of individual limitations, critical thinking, assertiveness, and confidence.

'Being humble is essential. No one is perfect, and it is through imperfection that we evolve.' P12

DISCUSSION

This study identified nurses' perceptions of barriers and facilitators at PACU for managing uncertainty in clinical reasoning.

The first major theme, 'barriers', reflects on the conditioning impact of uncertainty in nurses' clinical reasoning. The participants reported the situations experienced in their clinical practice and their impact on the personal and (inter) professional levels.

It is imperative to understand nurses' behaviour from the perspective of the TRA and the specific environmental influence.¹³ The contribution of perceived behavioural control related to the intention to perform the behaviour, the attitude toward the behaviour, and subjective norms may therefore be useful for the motivational force of change. Correcting misperceptions has been shown to reduce inadequate behaviours.¹³

An important aspect that emerged from this study is that nurses identified cognitive biases (anchoring, overconfidence) as adequate mechanisms for managing uncertainty. Nonetheless, these unconscious biases are not just individual; they also influence the organisational culture. Despite the most conscious efforts, the collective unconscious bias perpetuates the status quo and old patterns of behaviour and values. These unconscious norms of organisational behaviour exert an enormous influence over decisions and behaviours, influencing the effectiveness of practice improvement projects.²⁴

Time pressure, resource constraints, and the need to rely on cognitive shortcuts are likely to produce a lack of information, leading to negative outcomes. Nurses must work faster and stabilise patients as quickly as possible, without compromising their safety.³ The participants in this study also reported that reaction times influence the response.

Uncertainty can trigger aversive cognitive and emotional manifestations in individuals, which can lead to suboptimal decision-making and avoidance behaviours.²⁵ Underlining this, the occupational environment can also affect healthcare providers' wellbeing and mental health, leading in the short term to anxiety, concentration and sleep problems, headaches, and psychosomatic problems, as well as quality care problems.²⁶ The results of this study are consistent with the literature, namely regarding nurses' negative beliefs, sense of impotence and stagnation, need to hide professional fragility, dependence on action, avoidance of confrontation, and professional devaluation.

The participants mentioned that the lack of professional autonomy had an impact on their clinical practice. Labrague and colleagues also found that nurses with higher levels of autonomy tended to be high performing, satisfied, and committed in their jobs.²⁷ Organisational efforts are critical to fostering autonomy in practising nurses through adequate support, education, and training.

The attitudes towards the event of uncertainty revealed by participants suggest a risk of burnout. Self-regulation is impaired due to low motivation and poor ability to self-regulate behaviour.²⁸ Physical, behavioural, emotional, cognitive, social, and even existential problems presented by participants arise as a response to exposure to chronic occupational stress due to maladaptive strategies. Maladaptive regulatory resources lead nurses to self-blame (creating additional obstacles) and less job crafting (conditioning the balance between work demands and resources), negatively influencing their professional performance. Poor self-regulation, especially when nurses have low motivation and poor ability to regulate their behaviour, can lead to burnout.²⁸ In the perioperative environment, it may create an inefficient and toxic environment in which the organisation's goals, vision, and mission cannot be met.²⁹ Patient safety and access to surgical care may be compromised in organisations where nurses cannot manage uncertainty. Organisations must address the factors within their control to prevent burnout of their most precious resource, their staff.²⁹

Not everyone copes with potentially disturbing events in the same way. Some experience acute distress from which they are unable to recover. Others suffer less intensely and seem to recover quickly but then begin to experience unexpected health problems or concentration difficulties.³⁰ Hutchinson and colleagues had already highlighted the role of nurses'

RESEARCH ARTICLES

emotions in the development of clinical knowledge and skills.³¹ Emotionally informed situational awareness was described as an ability to rapidly recognise the significance of emotional information. Foregrounding emotional reasoning is a process of checking the meaning of emotions and deciding a path of action, prioritising technical issues.

The second major theme, 'facilitators', focused on the various psychological and behavioural responses to 'the subjective perception of ignorance' to maximise the positive potential of uncertainty.³² The more favourable a person's attitude is toward subjective norms and the greater the perceived control, the stronger the person's intention to perform the behaviour.³³

Uncertainty may serve as a self-protective force, resulting in increased information-seeking.²⁵ The research on uncertainty in healthcare is mostly linked to negative and conditioning aspects of practice. However, this study also addresses the positive side of this phenomenon. The participants recalled the often-forgotten cognitive resources/soft skills (creativity, curiosity, integrity, alterity, proactivity) used to manage uncertainty. On the other hand, the notion of nurses' personal development, also associated with their emotional self-regulation, goes beyond the technical and operational aspects, adding the personal/emotional dimension.

Uncertainty has adverse effects on cognition and emotions. The information overload caused by information complexity can lead to a feeling of confusion. However, the participants saw uncertainty as a driving force, namely through alterity, humility, critical thinking, and self-confidence. The reported behavioural outcomes were proactivity and assertiveness, which is consistent with studies suggesting that positive evaluations of uncertainty contribute to psychological adjustment and are an opportunity for greater dispositional optimism.³³

In addition, uncertainty presents challenges for patients, families, healthcare providers, policymakers, and researchers, and its management is key to providing patient-centred care.³⁴ The open disclosure of uncertainty is an ethical and moral imperative.³⁵ Personalised healthcare requires translating population-based evidence to the individual, which requires sophisticated understanding and communication skills.³⁰ If health professionals analyse their care experience based on their own individuality, they will make an approximation path in this sense.

Although uncertainty is not entirely synonymous with a lack of knowledge, it can emerge due to the characteristics and quality of available information. It seems natural that people would seek information when confronted with uncertainty.³³ This study corroborates these aspects, with the participants highlighting the importance of postgraduate training.

CONCLUSION

This study provides evidence supporting recent calls for the development of research and interventions to improve uncertainty management in ambiguous and complex healthcare settings like PACU. As uncertainty becomes a pervasive theme in healthcare, it is essential to recognise behaviours based on reasoned action and the realities of the context to undermine the barriers and maximise the facilitators. In moments of uncertainty, people are more likely to take refuge in non-analytical thinking that provides a sense of referential security. However, it is necessary to think about what is known, to see the phenomenon from another angle. Through uncertainty and doubt that the conscious construction of knowledge and the exercise of thought takes place.

IMPLICATIONS FOR RESEARCH, POLICY, AND PRACTICE

This study provides an overview of barriers and facilitators of uncertainty management in nurses' clinical reasoning in PACU. Understanding the moderators of uncertainty in clinical reasoning may have broad implications, impacting positively decision-making, patient safety, continuous professional development, professional communication and team collaboration, healthcare research, and the adaptability of healthcare providers to the complexities of their clinical practice. The crucial aspect of this research lies in exploring uncertainty within nurses' clinical reasoning, aligning with the goals of nursing knowledge and the imperative nature of evidence-based practice. Future studies on uncertainty in clinical reasoning should encompass both provider-centered and patient-centered outcomes.

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MANUSCRITO 4: Uncertainty Management Strategies in Clinical Reasoning: Perceptions of Nurses in Post-anesthesia Care Units

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RESEARCH

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Uncertainty management strategies in clinical reasoning: perceptions of nurses in post-anesthesia care units

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Abstract

Background While it is acknowledged that effectively managing uncertainty in nursing clinical practice is imperative for ensuring safe healthcare delivery, there remains a scarcity of guidance on enhancing uncertainty management within the clinical reasoning of nurses.

Aims To describe strategies that nurses in post-anesthesia care units use to manage uncertainty in clinical reasoning; and to map these strategies within the Integrative Framework of Uncertainty Management, and the clinical realities of Wiedenbach's Prescriptive Theory.

Material & methods A descriptive qualitative study. Fourteen nurses from a post-anesthesia care unit of a third-level hospital at the center region of Portugal were recruited using a convenience sampling method. Data were collected through semi-structured interviews and analyzed using thematic analysis using MAXQDA software. Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist was used for reporting. Ethical approval was obtained from the relevant Ethics Committee, with informed consent, confidentiality, and data protection measures in place to ensure participant anonymity and compliance with the Declaration of Helsinki.

Results The major theme 'uncertainty management strategies in clinical reasoning of nurses in Post-anesthesia Care Units' included four themes: ignorance-focused strategies, uncertainty-focused strategies, response-focused strategies, and person-focused strategies. These themes were mapped within key domains of nursing care: recipient, skills, policies, techniques, time sequence, agent, happenings, and supportive relationships. The domains encompassed various approaches such as person-centered care, evidence-based practice, postgraduate training, conflict management, critical thinking, continuous improvement projects, in-service team training, contingency planning, case discussions, simulation, self-reflectiveness, emotion self-regulation, optimizing working conditions, positive cognitive reframing, seeking support, fostering team reflection, and collaborative communication.

Conclusion Nurses in the Post-anesthesia Care Unit employed a range of uncertainty management strategies, which were effectively categorized within the Integrative Framework of Uncertainty Management (IFUM). Emphasizing nursing as a process, as described in Wiedenbach's Prescriptive Theory, these strategies were aligned with addressing

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the clinical realities tailored to each strategy. More research is needed to understand how the use of different strategies can promote nurses' wellbeing and enhance the safety of nursing care.

Clinical trial registration Not applicable.

Keywords Clinical reasoning, Nursing realities, Patient safety, Post-anesthesia nursing, Uncertainty

Introduction

Clinical reasoning is a fundamental process in nursing practice, wherein nurses utilize their knowledge, skills, and experience to assess patient conditions and make informed decisions regarding care [1]. It involves a dynamic, iterative process of collecting data, analyzing information, and making judgments, with the ultimate goal of ensuring safe and effective patient outcomes [2]. While clinical judgment and clinical reasoning are closely related, they serve distinct roles. Clinical judgment refers to the ability to make decisions in uncertain or ambiguous situations, whereas clinical reasoning encompasses the cognitive processes that guide decision-making in patient care [3]. However, clinical reasoning becomes even more complex in situations of uncertainty, where nurses must navigate incomplete information, unpredictable patient responses, and rapidly changing clinical conditions [4]. As a core competency in nursing [2], clinical reasoning is both dynamic and multifaceted, requiring nurses to continuously adapt to the dynamic and unpredictable nature of real-world clinical scenarios [5].

The complexities of the perioperative system, including workflow variability, diverse equipment handling, and ongoing uncertainty related to dynamic responses, contribute to the challenges faced in managing patient care [6]. Despite significant advancements in surgical safety, adverse event rates remain between 18% and 22%, with patient complications posing a major global public health challenge [7]. In resource-limited Post-Anesthesia Care Units (PACU), the incidence of complications can rise to 54.8% [8]. These challenges also resonate with complex decision-making in post-operative care [9], and uncertainty may present a significant barrier to effective clinical reasoning among nurses in PACU settings. The intricacies of uncertainty related with healthcare require a level of adaptability that traditional clinical reasoning frameworks may not always provide [10]. Therefore, describing the strategies that nurses in PACU use to manage uncertainty in clinical reasoning, and aligning them with specific frameworks and context-specific nursing clinical realities, can assist other nurses in better coping with the intrinsic uncertainties in post-anesthesia care practice [11].

Uncertainty is the metacognitive and conscious awareness of ignorance [12]. It emerges from a combination of external elements and circumstances in nursing care, which can shape the course of clinical events. Therefore,

it is crucial to consider Wiedenbach's Prescriptive Theory (PT) [13] that hinges on three pivotal components: foremost, the practitioner's recognition of the central purpose deemed essential in the realm of nursing; secondly, the prescription detailing how to fulfill this central purpose; and notably, the immediate situational realities within the nursing context that exert a profound influence on achieving the central purpose. The realities of nursing practice encompass physical, physiological, psychological, emotional, and spiritual factors that need to be embedded in the nursing action [13]. These factors can enhance the ability of nurses to achieve the desired results, and patients' ability to benefit from nursing care. However, this dynamic is unpredictable and disruptive, which nurses need to acknowledge and to respect, accept, and cope with consciously and responsibly. The ability to manage uncertainty is essential to accomplishing all of these tasks [13].

A study [14] offered practical tips for managing uncertainty, focused on oneself, students and trainees, and patients in health systems. Another study [15] investigated the strategies adopted by emergency nurses to address uncertainty in the event of emerging infectious diseases. Identified strategies included completion of a comprehensive assessment, continuing education, incorporation of guideline updates and mentoring into new roles and competences. The researchers also emphasized the need for education and training schemes that allow nurses to acquire and develop the necessary decision-making and problem-solving skills. This aligns with research [16], which found that sharing essential information for reviewing and developing clinical practice guidelines serves as a foundation for nursing care.

Uncertainty management entails surveying different approaches, as well as fostering uncertainty tolerance, which ultimately requires a comprehensive understanding of uncertainty. A conceptual framework of uncertainty management strategies developed by Han [17], hereafter referred to as the Integrative Framework of Uncertainty Management (IFUM), identifies interrelated tasks organized into four main categories according to their goals and focus, i.e. ignorance-focused, uncertainty-focused, response-focused, and person-focused. Ignorance-focused strategies aim to reduce uncertainty in clinical reasoning by decreasing the ignorance that constitutes its root cause. Uncertainty-focused strategies target not the ignorance that represents the object of

one's uncertainty, but the awareness of ignorance, which is necessary for uncertainty to exist as a metacognitive state. Response-focused strategies address people's psychological responses to uncertainty. These strategies differ from the ones that focus on ignorance or uncertainty in that they aim to palliate—i.e., soften or mitigate—its aversive psychological effects, rather than to reduce or “cure” uncertainty. Person-focused strategies are anchored on personal relationships, which may be both interpersonal and interprofessional [17].

The strategies employed to regulate uncertainty are intended to meet at least one of two main objectives: cure or palliation. Cure is the goal when clinical uncertainty is reducible, and palliation when uncertainty is irreducible. However, the reducibility and irreducibility of uncertainty can vary, according to the individual and situation [17]. Uncertainty management entails surveying different approaches, as well as fostering uncertainty tolerance, which ultimately requires a comprehensive understanding of uncertainty.

Strikingly, the empirical evidence on uncertainty management strategies used by nurses is limited, especially concerning information-seeking ones [18]. Identifying and systematically classifying uncertainty management strategies is a crucial first step toward developing comprehensive and accessible approaches to enhancing nurses' ability to manage uncertainty. By addressing this gap, this study seeks to offer practical insights that can directly inform clinical practice, improve nursing competency, and ultimately lead to better patient outcomes in these critical care settings. The aim is two-fold: (1) to describe strategies that nurses in post-anesthesia care units use to manage uncertainty in clinical reasoning (such as ignorance-focused, uncertainty-focused, response-focused, and person-focused strategies); and (2) to map these strategies within the Integrative Framework of Uncertainty Management and the clinical realities described by Wiedenbach's Prescriptive Theory.

Materials and methods

Research design

A qualitative descriptive study [19] was performed to capture PACU nurses' perceptions of uncertainty management strategies in clinical reasoning.

Setting and participants

The first author requested the nurse manager's assistance in disseminating the research opportunity to the 20 eligible PACU nurses through an institutional email announcement. Nurses expressing interest subsequently reached out to the primary author, who conducted further screening to confirm their eligibility. Convenience sampling [20] was employed to select nurses providing postoperative care in Phase I [21] in the adult PACU. The

Phase I PACU cares for patients directly after surgery, providing continuous nursing monitoring and addressing essential life-sustaining needs during the immediate postoperative recovery period [22]. The recruitment focused on a single PACU, managing an average of 30 to 35 surgeries daily and approximately 8,478 admissions annually. Post-anesthesia care was extended to various surgical specialties (colon and rectal, general, gynecology and obstetrics, gynecologic oncology, neurological and neurosurgery, ophthalmic, oral and maxillofacial, orthopedic, otorhinolaryngology, plastic and maxillofacial, urology, urogynecology and reconstructive pelvic surgery, vascular medicine) and nonsurgical specialties (dermatology, neuroradiology, psychiatry), along with special programs (kidney and liver transplantation, brain aneurysms) and a multidisciplinary approach to pain management. Nurses who were in training were excluded (less than six months of PACU professional practice and still in mentoring). Fourteen nurses who expressed interest in participating in the study were included and none dropped out.

Data collection

Individual semi-structured interviews [23] were used to collect data on the studied phenomenon from the participants. After recruiting nurses, individual face-to-face semi-structured interviews were conducted in a private room at the anesthesiology service, following a moderator guide developed by the research team (Supplementary File 1). The guide covered topics including participants' perspectives on problem-solving, solution identification, exploration of alternative strategies, evaluation of nursing intervention outcomes, and the resources used in managing uncertainty within the clinical reasoning of PACU nurses. We followed a structured approach [24] comprising three key steps: utilizing open-ended prompts to identify core events or experiences that illustrate the phenomenon of interest, structuring the questions to facilitate a natural and conversational flow - including an introductory rapport-building phase, a central exploratory section, and a final reflection to encourage additional insights - and refining the schedule through iterative review and piloting. A pilot interview [23] with one participant was conducted to assess the appropriateness of the questions, and no revisions were deemed necessary, making the pilot interview part of the final sample. Data collection took place from April to May 2022, involving 14 interviews lasting between 30 and 64 min, facilitated by the first study author (LC), a female medical-surgical nurse specialist and doctoral student working in the PACU. As insider researcher, LC was familiar with the local reality, maintained a reflexive approach during and after interviews, making annotations for clarification in subsequent sessions. All

interviews were audio recorded and transcribed verbatim through manual transcription. Participant demographic information, including gender, age, qualifications, academic degree, and years of professional experience as a nurse (both globally and in the PACU), was collected. The data collection concluded when thematic saturation was achieved, and no new data emerged [25].

Data analysis

In this study, the researcher LC served as both the interviewer and the transcriber, which helped minimize potential biases and ensured the quality of the transcript. The naturalized transcripts [26] were provided to each participant for validation [27], and all participants returned the interviews to the researcher without making any modifications. Data were analyzed hybrid inductive-deductively [28] following the IFUM and PT theoretical framework [13, 17] using Braun & Clark thematic analysis [29]. In Phase 1, researchers LC and MPS immersed themselves in the data to grasp its depth and breadth, identifying preliminary meanings and patterns. Phase 2 involved coding, wherein codes were generated based on the components of the theoretical framework, and data was organized accordingly. In Phase 3, data sets were coded and organized into themes using the coding guide derived from the theoretical frameworks. In Phase 4, a hybrid inductive-deductive analysis approach was used to refine the themes, drawing on the IFUM and PT theoretical frameworks for guidance. This approach ensured that our analysis was both theoretically grounded and open to emerging insights from the data. Phase 5 included reviewing and naming themes, with discrepancies resolved through consensus discussions among all the researchers. Results were validated through participant feedback in Phase 6, ensuring accuracy and resonance

with their experiences, ultimately leading to the collaborative production of the final report through discussion and consensus among all authors.

Data analysis was assisted by MAXQDA Analytics Pro 2022 software.

Rigor

The Criteria for Reporting Qualitative Research (COREQ) was used to report the study [30].

The trustworthiness [31, 32] of the study was established through transparent presentation of participant-generated results, while coherence in data analysis was achieved by detailing and verifying the reliability of inter-coding analysis, ensuring that findings remained impartial and unbiased. Credibility [31] was upheld through content validation involving member checks with expert nurses and a nurse researcher, peer debriefing of results with participants, and sustained engagement. Data convergence was strengthened by triangulation among researchers [32]. Auditability [31] was maintained by thorough scrutiny of the audit trail report, ensuring comprehensive documentation of the research process and the decisions made throughout. To enhance transferability [31, 32], a clear and detailed description of the procedure and data analysis was provided, allowing readers to assess the study's applicability in different settings.

Ethical considerations

Ethical approval was obtained from the Ethics Committee of the Health Unit's Innovation and Development of the hospital where the study was conducted. Nurses were provided with verbal and written information about the rationale of the study, data collection methods, and confidentiality in compliance with the Declaration of Helsinki. Written informed consent to participate was obtained from all participants before the interviews began. Code numbers were assigned to ensure participant anonymity (e.g. P1). After the completion of data collection, personal information was expunged from the transcripts to safeguard participant anonymity. The acquired data will be securely retained for a period of 10 years on a password-protected computer, adhering to the guidelines set forth by the Guide to the General Data Protection Regulation [33]. Subsequently, all data formats will be permanently deleted under the supervision of the research data support system.

Results

Table 1 presents the participants' characteristics, including their anonymized identifier, gender, professional role, and years of clinical experience in PACU.

The major theme, 'uncertainty management strategies in clinical reasoning of nurses in PACU', was drawn from the IFUM theoretical framework and further categorized

Table 1 Characteristics of the participants

Participant ID	Gender	Professional Role	Clinical Experience (total, years)	Clinical Experience In PACU (years)
P1	Female	Nurse Practitioner	19	16
P2	Female	Registered Nurse	22	22
P3	Female	Nurse Practitioner	16	14
P4	Female	Nurse Practitioner	26	12
P5	Female	Registered Nurse	10	4
P6	Male	Nurse Practitioner	20	18
P7	Female	Registered Nurse	30	28
P8	Female	Registered Nurse	25	10
P9	Male	Registered Nurse	16	4
P10	Male	Registered Nurse	28	15
P11	Female	Registered Nurse	27	22
P12	Female	Registered Nurse	31	31
P13	Female	Registered Nurse	20	9
P14	Male	Nurse Practitioner	23	19

into four themes based on the focus and descriptive characteristics of each strategy type: ignorance-focused strategies, uncertainty-focused strategies, response-focused strategies, and person-focused strategies. Subsequently, the PT framework was applied to identify the nursing realities that moderate the use of these strategies. The strategies were then categorized within the PT framework, which includes key nursing uncertainty-moderator realities, such as recipient, skills, setting, policies, goals, techniques, procedures, devices, agent, time sequence, happenings, and supportive relationships. Each of these nursing realities was integrated into the different strategies, meaning that not all realities are present in every strategy, but rather, they are tailored and aligned with specific strategies. Nonetheless, all these realities within each strategy ultimately converge toward the central purpose of nursing care.

Ignorance-focused strategies

Several reported ignorance-focused strategies related to the recipient of nursing care and nurses' skills. Table 2 shows the specific strategies, according to IFUM's conceptual taxonomy, as well as the illustrative quotes.

Uncertainty-focused strategies

Participants described different uncertainty-focused approaches, which aimed at logically structuring the uncertainty or disengaging from it, related to sub-themes of setting, policies, goals, techniques, procedures, and devices (cf., - Table 3).

Response-focused strategies

Participants identified several response-focused strategies aimed at reducing or palliating their emotional distress from uncertainty, related to the sub-themes agent, time sequence and happenings (cf., - Table 4).

Person-focused strategies

The strategies were mainly centered on developing supportive relationships (cf., Table 5).

The main findings of the study are displayed in Fig. 1. As a result of the broad range of uncertainty management strategies used by nurses in their daily work at the PACU, the strategies widely described and their feasibility in the post-anesthesia context were highlighted. The grey areas in the picture are related with nursing realities.

Discussion

The findings illustrate the diverse strategies nurses in the PACU setting use to manage uncertainty in clinical practice and shed further light on key needs and opportunities to improve the management of these uncertainties.

Central purpose: curative versus palliative

Nurses employ probabilistic decision-making based on the differentiation of various cause-effect assumptions, while accounting to the realities that mediate situations and influence the central purpose of nurses' clinical practice [13]. In this study, nurses demonstrated the prudence to orient themselves in ambiguous clinical situations and the flexibility to embrace multimodal uncertainty management strategies of curative and/or palliative intent. To address these issues, PACU nurses attempted to manage uncertainty using ignorance, uncertainty, response,

Table 2 Ignorance-focused uncertainty management strategies

General Strategy	Specific Strategy	Illustrative Quotes
Ignorance-focused	Recipient	person centered care 'You know that you must act in a certain way, there are protocols or guidelines, but they are not always suitable for the patients we have or the situation that lies ahead.'P13
		evidence based practice 'Scientific preparation and theoretical-practical knowledge will have to be the basis for sustaining our actions. I run the risk of entering that line of reasoning, a little bit based only on experience, based on belief, which can give me some internal certainties and I can even believe that I am doing well but that is not in fact scientifically validated certainty.'P6
	Skills	postgraduate training 'A very specific case and that stems from postgraduate training, has to do with respiratory assessment of patients, with auscultation, which was something that nurses used to resign because we think it is not our job. The analysis of a blood gas, for example. This is something that I think I am better at, and that I try to improve and understand what is going on with the patient.'P10
		conflict management 'Most of the problems that arise are exactly because of poor or no communication. It is an excellent resource. I put it at the bottom of the pyramid. Being worked on. If there is no communication, nothing can be done.'P14
		technical-scientific communication 'Learning how to structure your communication. To gather, structure and pass on that set of signs and symptoms in a technical and scientific way.'P3
		critical thinking 'Essentially, the strategy involves me having to ground myself more and have a critical vision of things. If I can understand, despite the strategy that I outlined was not the most correct one, I could not have the expected result, but I could identify what was at the origin of the poor planning of that strategy, I must work on these aspects.'P14

Table 3 Uncertainty-focused management strategies

General Strategy	Specific Strategy	Illustrative Quotes
Uncertainty-focused	Setting	anticipatory preparation 'When they are more critical situations like mechanical ventilated patients, more complicated surgeries, I try to prepare the unit to settling the patient. I prepare the invasive blood pressure and central venous pressure monitoring, and the endotracheal intubation material.' P1
		collaboration in managing patient handovers 'That reasoning that 'we need this one to leave because the patient coming in is at a higher risk level', can be very dangerous reasoning and can put patients at risk. It is not always easy to dismantle. Because a large part of the decisions does not pass through us or only through us. This generates some uneasiness precisely because at some moments we must allow events to unfold with some degree of uncertainty.' P6
	Policies	creation of 'led care' protocols 'Standardize protocols, review procedures, so that everyone can speak the same language and have the same line of thinking.' P14
		discussion of standardized care practices 'There should be opportunities to discuss occasional clinical cases to try to standardize care in those more occasional or unusual situations that may occur.' P2
		continuous improvement projects 'The primacy will be in terms of continuous improvement projects rather than exclusively in-service training. In-service training is important, but if it is not applied regularly and systematically, it is worthless. Continuous improvement projects, if they bring something new to our service, excellent!' P9
		in-service team training 'In-service training. Construction of working procedures. Regular training on the themes that make people more uncomfortable. Regular training is essential, even with themes suggested by the team.' P3
		contingency planning 'In case two or three major surgery patients arrive at the same time, if a patient becomes unstable or if there is a post-operative complication, there has to be a redistribution of staff to their units.' P4
		workload adaptation 'Sometimes you need to have availability. When you have these critical patients, you need to have time to be with them and be lucky enough to have certain details come to your attention. Because sometimes there is so much pressure, so many things to get everywhere, that we get a little lost. And there is no systematic evaluation, because there are always many requests, many interruptions, and this may go unnoticed.' P2
		complying with schedules 'To manage uncertainty, we should have fewer hours and fewer shifts in a row. I do not think anybody can think well or discern well, and the ones who get harmed are the patients. And the effort is greater.' P12
	Goals	normalizing uncertainty 'We are all in a constant learning process and therefore I think we should start looking at uncertainty differently.' P9
		focusing on uncertainty 'If you feel that you did not control the situation or that that situation is uncertain, you are going to create mechanisms, capacities, skills to control it, to make the uncertain less uncertain, to be able to better understand what happened or the phenomena. You are going to create conditions so that that situation would not be so uncertain anymore.' P13
	Techniques	clinical case discussions 'I find extremely relevant in uncertainty management to have regular team meetings where you can discuss and clarify doubts and uncertainties arising from clinical cases.' P9
		simulated clinical practice exercises 'Training, stimulating discussion of clinical cases, seeking simulation and doing clinical simulation on emergency events, anticipation of outbreaks of instability, prevention of post-anesthesia complications, pharmacology.' P3
		systematizing patient assessments 'I did a global assessment of the patient. We must see the patient as whole. You see the ABCDE assessment? The evaluation is by those parameters.' P5
		outline the nursing process through record keeping 'We often have a lot of turnovers and a lot of pressure, if we do not have things schematized, we end up making it easier. Nursing records help us refocusing. When I do an evaluation upon settling and discharge, I know that there are certain details that are not going to be forgotten, because I know that I want it to be recorded in the process that was evaluated. It forces schematization and evaluation and recording of that evaluation.' P2
		debriefing 'Most of the time, even working with other people around, our reasoning and our decision-making ends up being very solitary. That can indeed be disturbing, we may not be doing everything right. The point is that also because of what was debrief previously, I understand that we are all experiencing this difficulty.' P6

Table 3 (continued)

General Strategy	Specific Strategy	Illustrative Quotes	
	double-checking	'You always end up discussing the various solutions and trying to find the right answer. It ends up being a shared decision, which will contribute to double checking in certain situations. It will reinforce the positive outcome.'P2	
	peer review	'We are an open space unit, where the work is visible, where we are there in each other's eyes and I easily anchor myself, exchange impressions and seek support with the colleagues who are there.'P14	
	Procedures	structured hand-offs	'There is information that is given to us verbally when the operation room nurses are hand overing as we are setting up the patient in the unit. I think it is complicated. You absorb all the information they tell you, and then you lose information. It is ok that we can go online to check the information that is recorded but if there was a single process of handover, I think it would be easier.'P5
		information systems	'I think it is critical to have a greater connection to nursing information systems, like a system that would allow us to optimize the data that we could collect.'P10
		collaborative multidisciplinary patient care plans	'Small signs that we perceive deserve greater vigilance and attention. I try to validate with colleagues and trigger the anesthesiologist, so that we can jointly see of the sign that seems to me to highlight some risk for the patient. And try to somehow defend that that sign does not allow the patient to leave our surveillance.'P6
		Devices	user-friendly clinical support software
	computing resources		'And then there are the records and then you must take the information because the information is all in the computer and we only have two computers and then I do not know about therapeutic tables. Time is wasted.'P7

Table 4 Response-focused uncertainty management strategies

General Strategy	Specific Strategy	Illustrative Quotes
Response-focused	Agent	exercising self-reflectiveness
		'It is not about the patients; it is about me! These situations make me very anxious. It is also because of my personality, my way of being, my way of reacting to situations. Then at the end of the situations I try to stop, reflect, and realize if I did it right or not. Then I think: 'I am glad nurse X was there to help me! It is always that uncertainty.' P8
		exercising humility
	Time Sequence	'I have to admit that the ideal in behavioral terms would be humility, the recognition of these limitations.' P9
		emotion self-regulation
		'Even if you sit for 15 minutes, quietly reading a book, or doing nothing at all! May you concentrate, may you relax, may you strengthen yourself.' P7
		humor
		'Then I have time to decompress, to use the humor that is always needed.' P13
		acceptance of uncertainty: recognition of its fundamental nature
		'There must be some consultation out there that will help us to overcome these things, because sometimes uncertainty is not just a lack of knowledge. It has to do with our way of being, with our personality. Arrange some coping mechanisms to overcome this.' P8
	Happenings	seeking personal space and distance
		'It is worrying and disappointing because we give our best every day here, and sometimes we just do not give more because the institution itself is so formatted that it conditions the person himself. From the physical structure, we still do not have an informal space for things of normal life.' P12
		optimizing working conditions (shifts < 12 h)
		'When we did a 12-hour shift, we needed some time for ourselves. When I do 12 hours, from then onwards at 6/7 my degree of concentration must be much more exhausting. I seem to get more tense because I am more afraid of failing. Because I am more tired, it seems that my brain takes longer to respond.' P7
	Happenings	timed work breaks
		'Work breaks should be a concern, not only for the unit but of the institution. In units like this it is surreal. It increases the clinical risk and the more we talk about this it seems that less and less is done.' P12
	Happenings	positive cognitive reframing
		'I think it would be in everyone's interest to also start to stop having that idea that meetings and talking about situations are always to harm those who were there, who intervened in the situation, and start to see this as an excellent source of information and even promoter of improvement in the quality and safety of care.' P9

Table 5 Person-focused uncertainty management strategies

General Strategy	Specific Strategy	Illustrative Quotes
Person-focused	Supportive Relationships	
	looking for help	'I have already asked orthopedic nurses to help me with skin traction, which I did not know how to do or had no experience of doing. It is a risk to a patient to be doing something you do not know how to do. That is essential.' P12
	cultivating reciprocity	'We have a positive aspect in the team: we help each other, we work as a whole. That makes the uncertainties go smoothly. The team helps to mitigate the harm of uncertainty. In an emergency, the team comes together to tackle the situation that leads to such uncertainty.' P1
	promoting collaborative communication	'We can be comfortable to ask our questions, regardless of what it may bring to the other person. I believe that there must be a certain amount of comfort between us. It can be informal or formal, but with transparency. Of course, this is blurred by individual sensitivities.' P6
	fostering stand up meetings	'We should have small meeting moments to address certain situations that are linked to uncertainty in practice. To try to understand what failed you, what you did not do and what you should have done.' P13
	team reflection exercises	'In the face of uncertainty, you already have professional and personal experience. In similar situations, how did I act? I think that an important thing about working in intensive care units is to know and have the humility to ask for help. 'Man, I am missing something here! Help me, please. What can I offer more?' P4
	building open channels of communication	'Provide moments of communication between the teams. Because we are on a small island, but we end up having some contact with the other and know what is going on in the other surgical services. Informally, we try to get some feedback on what happens, how people solve some situations. But this could be formalized at an institutional level. Of problem solving, of training plans, of projects. Of the error, for example.' P13

and person-focused strategies. Strategies focused on ignorance and uncertainty were mainly centred on “curing” uncertainty by reducing ignorance or their consciousness of it. Response and person-focused strategies focus primarily on “palliating” responses to uncertainty, either by altering psychological responses to the triggering event or sharing the experience of uncertainty with others. Although the default strategy is to strive to cure the uncertainty, limited scientific knowledge and the psychological burdens of uncertainty require healthcare providers to also pursue its palliation [17]. However, uncertainty management strategies often intersect and overlap in their goals, which highlights the complexity of the phenomenon and the importance of their personal significance.

Ignorance-focused uncertainty management strategies

In complex clinical systems, with nonlinear dynamics characterized by a spectrum of (ir)reducible outcomes and (in)determinations, uncertainty can be a positive force. Namely, it might prompt clinical imagination through reflective questioning and use of active awareness of multiple possibilities to support lateral thinking in the clinical reasoning process [34]. Ignorance-focused strategies aim to overcome nescience. The growing complexity of patient care requires proficiency in information seeking, and the identification of highly reliable evidence [35]. In this study, PACU nurses emphasized uncertainty management strategies focused on the recipient and their skills, that helped them reduce ignorance and provide comprehensive evidence-based care.

Uncertainty-focused management strategies

Uncertainty is a universal attribute of science, which expands in proportion to the extension of knowledge [36]. Epistemic uncertainty concerns phenomena that we do not currently know but that we would be able to know, at least in theory, i.e., the knowledge on which decision-making is grounded stems from epistemic uncertainty [34]. In this study, participants utilized various uncertainty-focused strategies that aim to provide clarity and structure to their uncertainty, thereby enabling them to approach it in a more intentional and organized manner. ‘In-service team training’ and ‘simulated clinical practice exercises’ intersected with ignorance-focused strategies. Participants described these approaches in terms of knowledge acquisition as well as disengagement from their ignorance. Participants identified that protocolled care, discussion of standardized care practices, continuous improvement projects, in-service team training, simulated clinical practice exercises, and debriefing, are common policy-oriented strategies for ordering uncertainty. Other medical uncertainty-focused strategies like maximizing attention (e.g., double checking, peer review) and minimizing attention (e.g., systematizing patient assessments) are also meaningful. Importantly, all these strategies may reduce uncertainty in clinical reasoning, but they may also encourage cognitive passivity among nurses. This may especially be the case when there is a lack of time and resources to critically appraise and synthesize the best available evidence, or a lack of mentors to assist in the knowledge search strategy [12, 35].

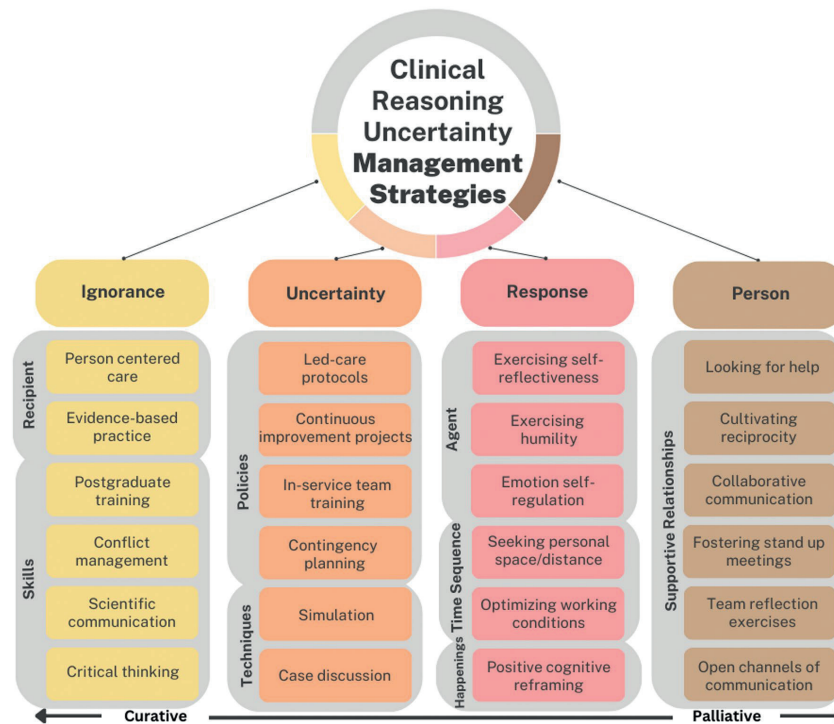


Fig. 1 PACU nurses' uncertainty management strategies

Response-focused uncertainty management strategies

Uncertain contexts can cause individuals to feel threatened by a lack of sense of belonging or lack of control [37], which can trigger compensatory strategies to adapt themselves [38]. In this sense, nurses' personality characteristics prompt different response-focused strategies to respond to uncertainty due to distinct needs [39]. Because feeling uncertain about oneself is generally aversive and maladaptive, our participants were motivated to reduce self-uncertainty through self-reflectiveness, exercising humility, emotion self-regulation, and humor. Nurses' self-evaluation appears to relate positively to their clinical decision-making: nurses with high self-esteem, self-efficacy, and internal locus of control make autonomous intervention decisions, seek alternative options, analyze patient data in detail, evaluate the consequences of these interventions, and partially seek new and additional information [40]. Also, active self-awareness allows nurses to attend to their cognitive, affective, and behavioral selves, which can improve their caring behaviors and sense of well-being [41].

In addition, adopting a new response-focused mindset and positive cognitive reframing reduces occupational stress and restores physical, mental, and spiritual nurses' well-being, enabling the provision of high quality [42]. Conjointly, research [43] confirms the effectiveness of humor interventions in promoting the meaningfulness and work enjoyment. Moreover, the response-focused strategies reported by study participants integrate moments of conscious engagement with uncertainty through moments of passive breaks from work that allows for self-regulation of emotions and reduction of work fatigue, which ultimately help to reduce anxiety and mitigate negative responses to uncertainty [44, 45]. These primary palliative strategies for handling irreducible uncertainty illustrate the mindset shift that allows nurses to accept the reality and irreducibility of uncertainty, and to orient themselves towards it in a more flexible and self-forgiving way.

Person-focused uncertainty management strategies

This study also showed how interpersonal and interprofessional relationships can be a resource to cope with uncertainty. Participants reported that person-focused uncertainty management strategies, such as building supportive and collaborative relationships with colleagues and sharing experiences of uncertainty with peers, promoted mutual trust and support among nurses, reduced feelings of isolation in decision-making, and lightened the emotional burden of uncertainty. Many participants stated that they anchored themselves to team members in situations of uncertainty where immediate decision-making was demanded. Yet nurses may also incorporate misinformation into the clinical reasoning process through passive evaluation of the accuracy of evidence and exposure to knowledge negligence [46]. While reliance on colleagues may be beneficial, it is thus not necessarily the primary goal of collaborative work, because there is a difference between sharing uncertainty and sharing professional responsibility either to know key information, or to care for the patient. The growing trend of interprofessional practices has led to an increasing focus on interprofessional collaboration [47]. Participants' reported uncertainty management strategies, such as seeking help, cultivating reciprocity, promoting collaborative communication, fostering stand up meetings, team reflection exercises and building open communication channels, imply a more fundamental goal of interprofessional collaboration. Working collaboratively is a way to better manage uncertainty: it fosters an ownership mindset, negotiation of overlapping roles and tasks, and creation of spaces to build caring relationships. The collaborative management of uncertainty can ultimately promote more synergistic, efficient, safe and high-quality healthcare delivery [47, 48].

Limitations

While data collection limited to one PACU might be viewed as a study limitation, detailed descriptions and contextual exploration ensured transferability, enabling readers to assess applicability in diverse contexts. Furthermore, contextual exploration incorporating the institutional mandate, and nursing conceptual framework facilitated broader interpretations.

Conducting interviews within the hospital may have influenced participants' responses due to its workplace association. To minimize this, interviews were held in a private room outside the clinical setting, ensuring a neutral, distraction-free, and convenient environment for open discussions. Having an insider researcher familiar with the local reality enhances problem-solving by leveraging participants' insights. Also, the dual role presented opportunities to address ethical and practical concerns, including the longitudinal approach fostering rapport,

trust, and familiarity with participants, while the hazard-ing process minimized bias and clarified inconsistencies between narrative and behavior.

Conclusions and recommendations

The study aimed to describe and map the uncertainty management strategies employed by nurses in PACU within two theoretical frameworks, aligning them with the core goals of nursing care. These strategies serve as practical tools, not merely theoretical concepts, helping nurses navigate situations with high uncertainty. More work is needed to further explore how to improve these strategies and the ability of nurses and other healthcare providers to manage clinical uncertainty more effectively. These are necessary skills to achieve the ultimate outcomes of improving patient safety and achieving high-quality, cost-effective care.

Uncertainty in clinical reasoning should be understood as a complex, multi-dimensional phenomenon, with different types that have overlapping and intersecting features and manifestations. A crucial dimension of knowledge and action in healthcare settings is to accept a certain degree of uncertainty as inherent to practice. It also is important to admit the influence of cognitive biases in clinical reasoning that do not necessarily undermine safety of care but may be a crucial nudge toward a more systematic approach to managing uncertainty.

The IFUM conceptual taxonomy allowed us to systematically approach uncertainty management strategies used by PACU nurses. The range of strategies promotes an understanding of uncertainty management as a dynamic metacognitive process of self-regulation and adaptation. However, the strategies listed are purely descriptive as they do not provide definitive answers to the normative question of uncertainty management. An unmet future research need is for a Prescriptive Theory frame that can provide guidance on what uncertainty management strategies should be used to achieve defined goals for planned activities, and to help nurses achieve an adaptive balance between cure and palliation of uncertainty. Conceptual frameworks such as the IFUM can facilitate this work by enabling the uncertainty management strategies used by nurses to be logically organized and approached.

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12912-025-03193-8>.

Supplementary Material 1

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Author contributions

Study conception and design: LC, MPS, LL, MRS. Data collection: LC, MPS. Data analysis and interpretation: LC, PH, FV, MPS, LL, MRS. Drafting of the article: LC. Critical revision of the article: PH, FV, MPS, LL, MRS.

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Data availability

Data that support the findings of this study are available from the corresponding author upon reasonable request.

Declarations**Ethics approval and consent to participate**

Ethical approval for the study was obtained from Coimbra Hospital and University Center (CHUC) (Approval Number: [No: 260/CES, Date: 14/04/2022]). Informed consent to participate was obtained from all participants prior to their involvement in the study, and all procedures adhered to the ethical guidelines outlined in the Declaration of Helsinki.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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Supplementary File 1. Interview moderator guide

Questions
1. Describe a clinical experience from a scenario/situation of uncertainty where you felt you made a difference. a) What information/data did you use to make decisions? b) How did you guide nursing clinical reasoning?
2. When you experienced situations of uncertainty, how did you try to solve the problem? A) How did you identify possible solutions? b) What was the result of this decision? c) Reflecting on the situation, do you think there would have been alternative strategies? d) Do you think that these alternative strategies could have changed the outcome of the situation? In what way?
3. What resources do you know and use to manage uncertainty in nursing clinical reasoning? Describe how you use these resources.

Capítulo III

Avaliação do raciocínio clínico sob incerteza dos enfermeiros das Unidades de Cuidados Pós-anestésicos através do *Post-anesthesia Nursing Script Concordance Test*[®]

Este capítulo inclui 1 manuscrito publicado

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MANUSCRITO 5: Assessing clinical reasoning under uncertainty through the Post-anesthesia Nursing Script Concordance Test: a multi-method methodological study

Cunha, L. D. M., Rahmatpour, P., Ventura, F., Pestana-Santos, M., Lomba, L., & Reis Santos, M. (2025). Assessing clinical reasoning under uncertainty through the Post-anesthesia Nursing Script Concordance Test: a multi-method methodological study. *Journal of PeriAnesthesia Nursing*. <https://doi.org/10.1016/j.jopan.2025.07.003>

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Research

Assessing Clinical Reasoning Under Uncertainty Through the Post-anesthesia Nursing Script Concordance Test: A Multimethod Methodological Study

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A B S T R A C T

Keywords:
 clinical reasoning
 postanesthesia nursing
 script concordance test
 uncertainty

Purpose: Clinical reasoning is essential in nursing for making informed decisions in complex health care environments. Frameworks such as Script Theory assist nurses in organizing knowledge into “scripts,” which support pattern recognition, data interpretation, and uncertainty handling. While Script Concordance Tests have proven effective in nursing education, their application in the ongoing professional development, particularly in specialized areas such as postanesthesia care, has not been widely explored. The purpose of this study was to develop the Postanesthesia Nursing Script Concordance Test (PaNSCT) and to assess its validity.

Design: Multimethod methodological study.

Methods: The study was conducted in three phases: Phase I focused on construction and construct validity; Phase II assessed reliability, acceptability, and appropriateness through PaNSCT scores and qualitative feedback from two groups—clinical experts and nurses in perioperative settings; and Phase III concentrated on sustainability, including intellectual property registration. Data analysis included descriptive statistics, Pearson's correlation, Cronbach's α , and content analysis.

Findings: The construct validity of the PaNSCT, with 20 cases and 60 items on postanesthesia care, was established through expert consensus, making only minor semantic adjustments. PaNSCT exhibited Cronbach's α of 0.92 and effectively differentiated mean scores of clinical experts (44.8 ± 4.7) from nurses ($39.9 \pm 6.1, P = .01$). Nurses' scores showed a positive correlation with postanesthesia care unit experience ($r = 0.58, P = .009$), while no significant correlations were found for experts. Panelists highlighted PaNSCT's value in clinical training, the importance of preliminary Script Concordance Tests education, and opportunities for expanding vignettes. PaNSCT showed strong reliability and validity in assessing clinical reasoning under uncertainty in postanesthesia care, with clinical experts outperforming nurses, emphasizing the importance of advanced training and specialization. Nurses with more postanesthesia care unit-specific experience scored higher, highlighting the value of context-specific knowledge.

Conclusions: PaNSCT is a valuable tool for assessing clinical reasoning under uncertainty, with the potential to advance nursing education and foster the development of reasoning skills in postanesthesia care.

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Clinical reasoning is a complex process that uses cognition, metacognition, and discipline-specific knowledge to gather and analyze data, diagnose, and address patients' needs.¹ It is recognized as a crucial skill and a fundamental aspect of nurses' professional competence, particularly in unpredictable health care settings where nurses must navigate uncertainty and rapidly changing patient conditions.² Broadly defined, clinical reasoning is a context-dependent process that guides clinical decision-making and involves both conscious and unconscious cognitive processes.³

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L.D.M. Cunha et al.

Journal of PeriAnesthesia Nursing xxx (xxxx) xxx–xxx

According to Script Theory, knowledge is organized into networks called “scripts.” Using scripts is possible to establish causal connections between elements of knowledge and guide how individuals select, interpret, and memorize information.⁴ These mental frameworks help to integrate new information with existing knowledge, recognize patterns (script recognition), interpret events, and make predictions.⁵ In health professions, knowledge networks are referred to as illness scripts.⁶ The cognitive activation of these scripts depends on key clinical features serving as “anchor points” in memory, triggered by initial cues from the patient or clinical environment.⁷ These activated scripts shape the provider's expectations during patient interaction. Clinical data interpretation evaluates how well the gathered data aligns with the attributes corresponding to the expected activated scripts.⁸ Script instantiation is when individuals fill up a script's “slots” with current data or knowledge they have collected for later use.

The cognitive effort required for this process can range from rapid, intuitive pattern recognition (nonanalytic) to slower and deliberate reasoning (analytic). It depends on the nurse's script repertoire and situational factors such as case complexity, ambiguity, urgency, and stakes.^{8,9} As nurses store more scripts, they can more efficiently handle diverse clinical situations, allowing for quicker, more intuitive decision-making with less cognitive strain.¹⁰

Script Concordance Tests (SCTs) assess higher-level reasoning by presenting real-life clinical scenarios that reflect common uncertainties, evaluating respondents' clinical reasoning through their microjudgments, and exploring their ability to generate hypotheses and choose appropriate interventions.⁸ Several studies have explored the use of the SCT as a tool to assess clinical reasoning in nursing education.^{11–13} Research has shown that SCT is particularly effective in evaluating decision-making among undergraduate students^{14–16} and newly graduated nurses.¹⁷ While illness script-based interventions can improve students' ability to analyze and interpret clinical cases, nursing-specific adaptations are necessary to address the unique complexities of the field.¹⁸ The effectiveness of the SCT in enhancing clinical reasoning is well-documented; however, its application in the context of continuous nursing education remains significantly underexplored.

This study aimed to develop the Postanesthesia Nursing Script Concordance Test (PaNSCT) and to assess its validity. Since the SCT approach provides essential training for effectively managing the uncertainties inherent in clinical nursing practice,¹¹ the goal of designing the PaNSCT is to enhance continuing education within perioperative nurses.

Methodology

This multimethod methodological study was conducted in three distinct phases: Phase I focused on construction—encompassing the design of clinical vignettes, selection of a reference clinical expert panel, creation of a scoring matrix—as well as construct validity. Phase II addressed reliability, acceptability, and appropriateness, derived from test scores and qualitative insights collected through open-ended postsurvey questions. Phase III emphasized sustainability, including the registration of intellectual property to secure the PaNSCT's long-term use as a validated resource. Ethical approval was obtained from the Ethics Committee of the Health Sciences Research Unit: Nursing (UICISA:E) [reference P942_02_2023]. Data collection for Phases I and II took place through a national survey conducted between September and December 2023.

Phase I: Construction and Validity

This phase consisted of the development of the PaNSCT's core components. SCTs comprise short clinical scenarios that are designed

to represent the way new information is processed during clinical reasoning.¹⁹ The first question, “If you are considering,” presents a hypothesis, which could be a potential nurse diagnosis, an investigative option, or a nurse intervention relevant to the case. The second question, “And you find,” introduces new information, such as a physical exam finding, a pre-existing condition, an imaging result, or a lab test outcome, which may impact the initial hypothesis. The third question, “The hypotheses will become,” asks the respondent to rate the effect of the new information on the initial hypothesis using a 5-point Likert scale, ranging from “–2” (ruled out or almost ruled out) to “+2” (certain or almost certain). The respondents select a value on the scale to indicate how the new information influences the proposed hypothesis. The main goal is to determine the impact (positive, negative, or neutral) and the intensity of the new finding on clinical reasoning, which, according to script theory, involves a series of qualitative judgments measured using a Likert scale.¹⁹ Each item related to a particular scenario is independent of the others, without influence from the content of other items.

The development of the SCT follows three essential steps: (1) designing clinical vignettes and test items based on real cases, (2) selecting a reference clinical expert panel, and (3) creating a scoring matrix.¹⁹

Designing Clinical Vignettes

The PaNSCT was constructed according to SCT developmental guidelines.²⁰ To draft the test, one developer formulated proficient questions implying knowledgeable expertise that accurately reflected postanesthesia care scenarios, ensuring both content validity and clinical ambiguity. The draft was peer reviewed by the research team. The clinical vignettes were aligned with the perioperative nursing curriculum, as issued by the Portuguese Nursing Board (*Ordem dos Enfermeiros*) and following the Perioperative Patient Focused Model.²¹ The vignettes and questions were designed to follow the ABCDE approach,^{22,23} as well as general nursing domains and clinical practice guidelines. This systematic approach is particularly important in the postanesthesia setting, where patients are at increased risk for complications such as airway obstruction, respiratory depression, and cardiovascular instability.²²

Two team members were responsible for proofreading the test items before the content validation. An example of PaNSCT vignette and related items is shown in Figure 1.

Selecting Clinical Expert Panel

Experts were recruited through outreach on social media, the National Board of Nurses (*Ordem dos Enfermeiros*, professional regulatory body in Portugal responsible for overseeing the nursing profession), the Association of Specialist Nurses in Medical-Surgical Nursing (*Associação de Enfermeiros Especialistas em Enfermagem Médico-Cirúrgica*, which includes perioperative specialists), and the Association of Operating Room Nurses (*Associação dos Enfermeiros de Sala de Operações*). Additionally, a snowball sampling technique was employed to further expand the sample.

Establishing criteria for clinical expertise was challenging due to the lack of specialized training programs in postanesthesia care and the absence of consensus regarding technical and nontechnical competencies, according to the International Collaboration of PeriAnesthesia Nurses Board.²⁴ In the context of perioperative care, the term “perioperative clinical nurse specialist” can be used to describe nurses with advanced training in this field. In Portugal, however, this role also encompasses care delivery in the postanesthesia care unit (PACU), as this specific specialization does not formally exist in the country. Before the official recognition of the perioperative nursing specialty in 2019, advanced education in this area was limited to postlicensure specialization courses and master's programs in medical-surgical nursing.

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L.D.M. Cunha et al.

Journal of PeriAnesthesia Nursing xxx (xxxx) xxx-xxxx

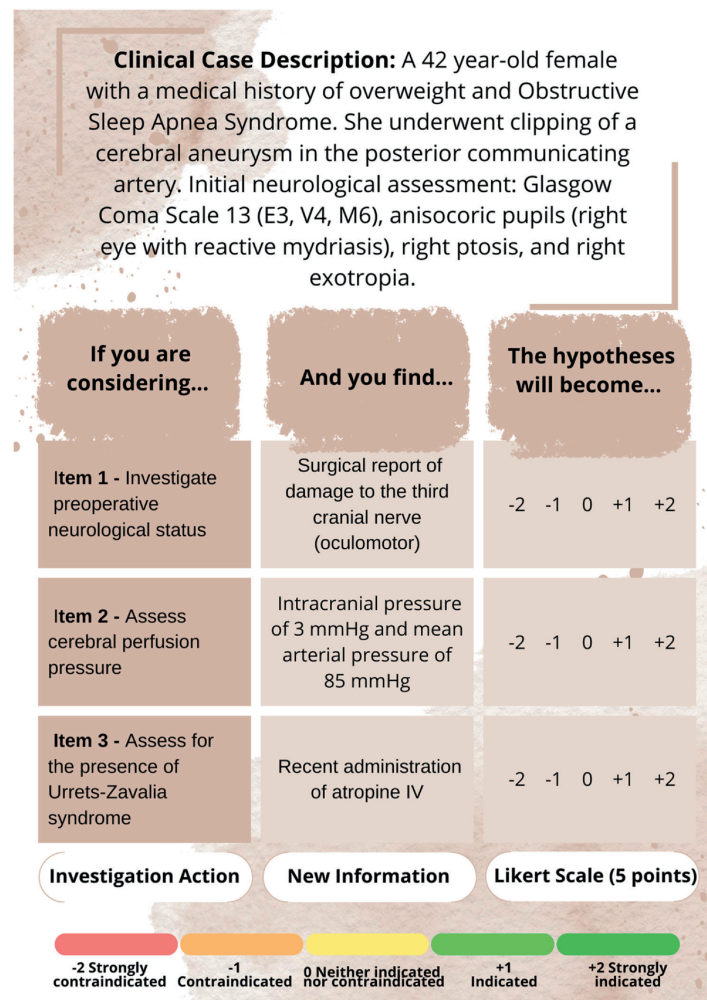


Figure 1. PaNSCT clinical case and related questions. PaNSCT, Postanesthesia Nursing Script Concordance Test. This figure is available in color online at www.jopan.org.

Scoping the literature, the criteria for selecting clinical experts are grounded in established models and theories, as well as empirical studies. The Cognitive Maturation in Nursing Practice Model by O'Neill and Dluhy²⁵ suggests that nurses reach a clinical experience level after approximately 3 years of practice, during which they develop both analytical and intuitive clinical reasoning skills, enabling them to make informed decisions in dynamic health care environments. Additionally, the Clinical Nursing Expertise Survey²⁶ underscores the importance of formal education, demonstrating a correlation between nursing expertise and postgraduate training or specialization. This reinforces the idea that advanced education is crucial in enhancing clinical competencies. A minimum of 15 panel members is desired to achieve acceptable reliability estimates.²⁷

The selected panel members completed the test individually, and their responses were used to develop the scoring key and the matrix. The data from the panel were anonymized to ensure objectivity. The scores indicate the degree of alignment with the clinical reasoning of the experts. A high level of concordance is interpreted as an indicator of optimal information use in the context of these specific tasks, thereby reflecting the quality of clinical reasoning.²⁰

Creating Scoring Matrix

Several studies have used aggregate scoring methods for the SCT to address expert disagreement in uncertain scenarios, recognizing response variability when validating answers.^{28,29} The response

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L.D.M. Cunha et al.

Journal of PeriAnesthesia Nursing xxx (xxxx) xxx-xxx

Table 1
Example of SCT Scoring With a Hypothetical Panel of Five Expert Panelists

	Strongly Contraindicated -2	Contraindicated -1	Neither Indicated nor Contraindicated 0	Indicated +1	Strongly Indicated +2
Number of experts choosing	0	0	2	3	5
Credit for answer	0	0	2/5	3/5	1

SCT, Script Concordance Test.

chosen by most clinical experts is designated as the “gold standard” for clinical reasoning, while other responses represent alternative perspectives. These variations are partially credited because they remain clinically relevant. As a result, SCT items do not have a single “correct” answer; instead, different responses receive varying credit levels.¹⁹

Answers that match the modal response (ie, the most frequently selected answer) from the reference panel are awarded a score of 1. Answers that differ from the modal response receive partial credit, which is calculated as the proportion of reference panel members who selected that answer compared to those who chose the modal response.³⁰ Table 1 provides an example of aggregating scoring, illustrating how credit is assigned based on a hypothetical panel of five experts' responses, purely for explanatory purposes.

In the example, with 5 experts, none selected “strongly contraindicated” (−2) or “contraindicated” (−1), so these responses received 0 credit. Three experts selected “indicated” (+1), resulting in partial credit in 3/5. The majority (5 experts) selected “strongly indicated” (+2), making it the most common response (ie, modal response) and awarding full credit (1) to nurses who selected this option. This scoring approach reflects the distribution of expert opinions, recognizing all clinically relevant responses, while emphasizing the consensual option for the majority. Two experts selected “neither indicated nor contraindicated” (0), earning partial credit in 2/5. Three experts selected “indicated” (+1), granting a partial credit in 3/5. The majority (all five experts) selected “strongly indicated” (+2), making it the modal response and awarding full credit (1) to nurses who selected this answer.

Still in Phase I, construct validity,³¹ in line with the terminology used in academic literature, was enhanced by feedback and refinement from a scientific panel of three PhD experts in perioperative care. These experts were chosen based on multiple criteria, including professional board certification, academic titles, peer-reviewed publications, and years of practice. Their involvement in relevant cases or research was also considered. Additional emphasis was placed on professional reputation, as recognized by peers, professional associations, or awards. The PaNSCT was previously reviewed by the scientific panel members, followed by two formal online meetings for further discussion.

Phase II: Reliability, Acceptability and Appropriateness

The PaNSCT was disseminated to two groups: the clinical expert panel and nurses working in perioperative settings (ie, PACU nurses, operating room nurses, and those working in both PACU and operating rooms). Data were collected using SurveyMonkey®, with participants accessing the survey through a link provided in an email invitation. The sampling method employed was an intentional nonprobability approach aimed at maximizing variation.

To promote sample representativeness, the researchers used a platform promoting inclusive participation, established quotas for different respondent groups, and limited non-naïve respondents by stratifying experience levels and capping HITs (number of files downloaded on a website, approved tasks). Prescreening was considered to prevent fraudulent behavior by using data integrity tools

to avoid duplicate responses or suspicious Internet Protocol (IP) addresses. Ethical practices included managing participants' expectations around privacy, using encrypted password systems and assigning unique identification (ID) codes to track progress and maintain security. A privacy statement outlined data use, participants' rights, and measures for anonymity, confidentiality, and data protection.³² Data were saved directly in a database for import into the analysis program, with storage in a password-protected directory. The output was saved as tab-delimited text to ensure correct migration. Missing data were considered as no response to the item.

Informed consent was obtained through online statements that required respondents to agree to the terms of participation, implying consent as a mandatory step to proceed with the survey completion. Ethical concerns related to online data collection were addressed by avoiding financial incentives for recruitment and ensuring informed consent, transparency, and clear communication of the research's purpose.³³

Reliability

The collected data encompassed reliability³¹ metrics derived from test scores. Descriptive statistics were performed for both groups by frequencies, means, and standard deviations. The PaNSCT data were exported into Excel and scored using the aggregate scoring method. Data normality was tested using the Shapiro-Wilk test, with α set at P less than or equal to .5. Internal consistency of SCT items was evaluated using Cronbach's α , with a desired range of 0.7 to 0.9.³⁰ Differences between clinical experts and nurses' scores were analyzed using Pearson's correlations. All analyses were conducted using IBM SPSS version 29.0 (SPSS, Inc), and a significance level of P less than or equal to .05 was considered for all tests.

Acceptability and Appropriateness

The postsurvey assessed acceptability³¹ by gathering panelists' knowledge or experience with various aspects of the PaNSCT, including content, complexity, delivery, and credibility, while also evaluating its appropriateness³¹ in the postanesthesia setting through questions outlined in Table 2. Qualitative data from open-ended survey responses were analyzed by two researchers (L.C. and M.P.S.) through content analysis using MAXQDA Analytics Pro 2022 software.

Phase III: Sustainability

The final phase, guided by key concepts such as continuation, durability, incorporation, integration, and sustained use, focused on the formal registration of the PaNSCT. Efforts were directed toward securing intellectual property rights to safeguard the tool and ensure its long-term sustainability.³¹ This step was essential for establishing the test as a durable, legally protected tool for continued use. Additionally, preparations were undertaken to support broader dissemination through the IP registry, fostering its integration, institutionalization, and sustained adoption in both clinical and educational contexts. The comprehensive summary of the validation process is presented in Figure 2 for clarity.

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L.D.M. Cunha et al.

Journal of PeriAnesthesia Nursing xxx (xxxx) xxx–xxx

Table 2
Postsurvey Open-ended Questions

Open-ended Questions
1. Were you familiar with the SCT tool before?
2. Do you consider the SCT a useful tool for evaluating clinical reasoning in nursing?
3. Are the scenarios described in the PaNSCT appropriate to the reality of postanesthesia/perioperative nursing practice?
4. Do the scenarios describe or reflect situations you have encountered or expect to encounter during your postgraduate education and/or postanesthesia/perioperative nursing practice?
5. Was PaNSCT helpful in testing your clinical reasoning ability through situations of uncertainty in postanesthesia/perioperative nursing practice?
6. Please describe your suggestions for using the PaNSCT as a tool for postgraduate learning and ongoing perioperative training.

SCT, Script Concordance Test; PaNSCT, Postanesthesia Nursing Script Concordance Test.

Results

The Portuguese version of PaNSCT includes 20 cases and 60 items focused on nursing postanesthesia care. Each clinical vignette includes three items. It is registered under Copyright Number 1233/2024. An English version has also been created for publication (Supplementary File 1), as the translation has not yet been validated. Construct validity was established through consensus among three experts, who made only minor semantic adjustments. No significant changes were made to the original vignettes, ensuring the document remained semantically optimized while preserving its core content.

Building on previous frameworks, a clinical expert panel was formed, comprising 16 specialized nurses in medical-surgical, perioperative care, or both, each with at least 3 years of clinical experience in the category. Additionally, 19 nonspecialized nurses participated in the study. A total of 16 clinical experts and 19

Table 3
Demographic, Professional, and Academic Characteristics of Clinical Experts and Nurses

Variables	Group	Clinical Experts (n = 16)		Nurses (n = 19)	
		n	(%)	n	(%)
Gender	Female	13	81.3	16	84.2
	Male	3	18.8	3	15.8
Clinical setting	OR	5	31.3	4	21.1
	PACU	5	31.3	12	63.2
	OR and PACU	6	37.5	3	15.8
	Public	15	93.8	18	94.7
Workplace sector	Private	1	6.3	1	5.3
	Fixed	2	12.5	2	10.5
Work schedule	Shifts	11	68.8	16	84.2
	Flexible	3	18.8	1	5.3
Work exclusive	Yes	3	18.8	5	26.3
	No	13	81.3	14	73.7
Academic	Bachelor	3	18.8	18	94.7
	Master	12	75.0	1	5.3
	PhD	1	6.3	0	0
	Mean	SD	Mean	SD	
Age	45.1	10.0	42.4	8.1	
Professional experience (y)	22.7	9.5	19.4	8.3	
Perioperative experience (y)	14.9	10.2	13.4	8.1	
PACU experience (y)	15.4	9.5	12.3	8.4	
Seniority and length of service	8.7	9.2	18.3	9.4	

Gender: a group of people in a society who share particular qualities or ways of behaving which that society associates with being male, female, or another identity.

nonspecialized nurses contributed, resulting in a 74.0% response rate. Table 3 provides a descriptive summary comparing the two groups across demographic, professional, and academic variables. Clinical experts are slightly older than nurses, with both groups primarily female. Clinical experts are more evenly distributed across clinical settings, while nurses predominantly work in the PACU.

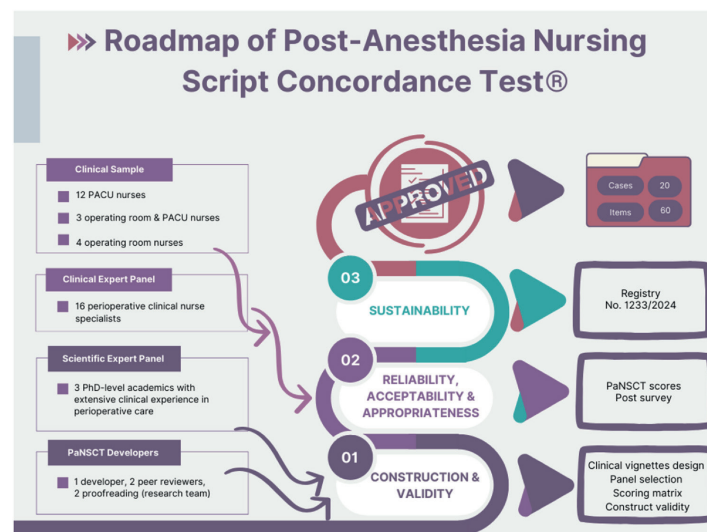


Figure 2. Comprehensive summary of the validation process for the PaNSCT. PACU, postanesthesia care unit; PaNSCT, Postanesthesia Nursing Script Concordance Test. This figure is available in color online at www.japan.org.

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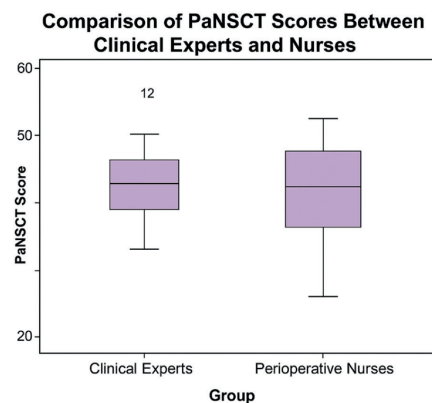
L.D.M. Cunha et al.

Journal of PeriAnesthesia Nursing xxx (xxxx) xxx-xxx

Table 4
Comparison of the PaNSCT Scores Between Clinical Experts Panel and Nurses

Panel ID	Sample	Mean (%)	SD	Range	t (df)	P Value
Clinical experts	16	44.8	4.7	37.1-57.8	2.6 (33)	.01
Nurses	19	39.9	6.1	26.3-48.3		

PaNSCT, Postanesthesia Nursing Script Concordance Test.

**Figure 3.** Boxplot comparison of PaNSCT scores between clinical experts and nurses. PaNSCT, Postanesthesia Nursing Script Concordance Test. This figure is available in color online at www.jopan.org.

Clinical experts have more professional experience on average, while nurses have greater seniority and longer length of service.

For each item, the pattern of clinical expert panel responses was analyzed.³⁴ The panel responses were classified as follows: 1 uniform, 54 ideal, and 5 bimodal responses. Although bimodal responses were excluded in some studies, we chose to assign a proportional score to these responses based on the frequency of answers after applying the aggregation method.³⁵

At this point, we illustrated different datasets used to assess reliability, including the internal consistency of the PaNSCT, and the PaNSCT's ability to differentiate scores between the two groups through variable correlation. The Cronbach's α was 0.92, indicating satisfactory internal consistency of the PaNSCT.

The comparison between the scores of the clinical expert panel and nurses is shown in Table 4. The clinical expert panel achieved a higher mean score, compared to nurses. A *t* test confirmed the difference in means as statistically significant ($t(33) = 2.6, P = .01$).

Figure 3 presents a boxplot comparing the distribution of PaNSCT scores between clinical experts and nurses. The expert group demonstrates a higher median score (approximately 46) and a narrower interquartile range, indicating greater consistency in responses. In contrast, the nurse group shows more variability, with a wider interquartile range and lower median (approximately 41).

Table 5
Correlation Between PaNSCT Scores and Professional Variables for Clinical Experts and Nurses

	Professional Experience (Total)		Professional Experience in PACU		Perioperative Professional Experience	
	Pearson Correlation	P Value	Pearson Correlation	P Value	Pearson Correlation	P Value
Clinical experts	-.004	.85	-.016	.54	-.018	.49
Nurses	.022	.34	.058	.009	.420	.07

PaNSCT, Postanesthesia Nursing Script Concordance Test; PACU, postanesthesia care unit.

The expert scores range from around 37 to 57, with one outlier above 57, while nurse scores range from approximately 26 to 48. This visual representation reinforces the differences in performance and response consistency between the two groups.

The relationship between PaNSCT scores and professional experience, professional experience in PACU, and overall perioperative experience was assessed by Pearson correlation coefficient for both clinical experts and nurses (Table 5). Among experts, no significant correlations were found between PaNSCT scores and any of the experience variables. However, for nurses, PaNSCT scores demonstrated a significant positive correlation with professional experience in PACU ($r = 0.58, P = .009$), suggesting that increased PACU experience was associated with better score on the PaNSCT. Additionally, a moderate, nonsignificant correlation was observed with perioperative experience ($P = .07$), while professional experience overall showed a weak, nonsignificant correlation ($P = .34$). No statistically significant correlations between nurses' PaNSCT scores and other sociodemographic variables were found.

The postsurvey revealed three key themes based on panelists' insights and experiences with the PaNSCT. First, "Incorporation into Clinical Training" highlighted the strong potential of incorporating PaNSCT in on-the-job training exercises, enabling health care teams to review cases, address uncertainties, and promote consistent, high-quality care practices. Second, "Importance of Preliminary Training" highlighted the value of initial training on the SCT approach, as it provided essential guidance to help participants better understand and interpret scenarios that were new to their prior experience. Third, "Potential for Expanding the Vignettes," highlighted that, although the vignettes were insightful, future adaptation could improve their relevance across perioperative clinical settings. Overall, panelists regarded the PaNSCT as a valuable tool for evaluating clinical reasoning, especially in situations of uncertainty, and recommended its implementation in perioperative training to foster ongoing education and improve clinical decision-making skills.

Discussion

This study aimed to develop the PaNSCT and assess its validity, with the outcomes contributing to a deeper understanding of clinical reasoning under uncertainty and providing evidence for its reliability as a tool for assessment in postanesthesia clinical settings. The newly developed PaNSCT demonstrated strong internal consistency among the test items. This result aligns with the literature, where a Cronbach's α value above 0.9 is considered to reflect robust consistency in measuring decision-making abilities.^{30,36-38}

Construct validity was confirmed, aligning with the judgments of the scientific expert panelists, as the PaNSCT effectively assesses clinical reasoning under uncertainty. In the context of SCT, construct validity and reliability are also grounded on the premise that panelists with more developed illness scripts interpret data and make judgments that increasingly align with those of clinical experts in similar scenarios.^{39,40} The SCT scores typically increase with higher levels of training.³⁰

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L.D.M. Cunha et al.

Journal of PeriAnesthesia Nursing xxx (xxxx) xxx–xxx

In this study, clinical experts outperformed nurses on the PaNSCT, demonstrating superior and more consistent clinical reasoning skills. While experience provides a foundation, expertise requires deliberate practice, continuous learning, and engagement with evidence-based practices to refine judgment and competence.⁴¹ The evolving challenges in nursing underscore the necessity for continuing professional development specialization and advanced education to cultivate expertise and improve patient care in response to global healthcare demands.⁴² Nursing expertise goes beyond years of experience, requiring a comprehensive understanding of theoretical knowledge and the dynamic process of “being” and “becoming.” It focuses on the journey of developing skilled professionals, rooted in broad perspectives, as knowledge provides the foundation for this growth.⁴³

The variance in PaNSCT scores between the clinical expert and nurse groups underscores the importance of specialized training. According to the International Council of Nurses, a specialized nurse is one who, through advanced education and training, has gained expertise in a specific area of practice, allowing them to deliver specialized care and make complex decisions within that field.⁴⁴ The differences between nurse specialists and registered nurses were previously highlighted, emphasizing that nurse specialists are skilled in managing more complex caseloads with enhanced judgment, independence, and accountability.⁴⁵ One might consider that specialization could “normalize” the expertise gaps that usually stem from years of professional experience by equipping nurses with specific, expert-level skills that lessen the influence of experience alone. Interestingly, no significant correlation was found between clinical expert PaNSCT scores and their years of professional or perioperative experience. Some evidence suggests that the overall level of education plays a key role in the expertise of clinical nurses, regardless of their individual education or experience levels.⁴⁶ Other studies indicate that both a nurse’s education and years of experience are linked to their expertise in clinical nursing.^{47,48} Regardless of experience or education level, it is important to recognize that both individual and contextual factors play a significant role in shaping expertise.⁴⁶

Nurses exhibited a significant positive correlation between PaNSCT scores and their professional experience in PACU. Specifically, nurses with greater PACU experience performed better on the PaNSCT. This finding highlights the potential value of specialized, context-specific experience in shaping clinical reasoning abilities. The results suggest that PACU-specific knowledge may play a more direct role in influencing clinical decision-making in post-anesthesia care scenarios. However, while perioperative experience also showed a moderate correlation with PaNSCT scores, this was not statistically significant. This could indicate that experience alone is not enough to explain variations in clinical reasoning; other factors, such as the depth of knowledge and exposure to diverse clinical cases, may also contribute.^{49,50} However, the nursing shortage, especially in postanesthesia care, poses significant challenges due to the limited supply of critical care nurses and the specialized skills required.⁵¹ Units that rely exclusively on dedicated PACU staff face challenges in cross-covering responsibilities during staffing shortages. To address this, some⁵² prioritized cross-competency across all phases of care to improve staffing flexibility and team cohesion. A structured fellowship program, featuring blended learning, skill layering, preceptor development, and mentorship, can help novice nurses become confident and competent PACU providers.⁵²

The postsurvey highlighted three key themes: the potential for incorporating the PaNSCT into on-the-job clinical training, the importance of preliminary training to help participants interpret scenarios, and the possibility of expanding the vignettes for broader perioperative relevance. Panelists viewed the PaNSCT as a valuable

tool for assessing clinical reasoning and recommended its use in perioperative training to enhance education and decision-making. By presenting clinical trainees with ambiguous scenarios and evaluating their data interpretation in a manner that reflects real-world practice, the SCT offers a unique and robust approach to assessing this critical competency.^{8,37} Training is necessary to effectively complete the PaNSCT because it helps participants become familiar with the test format, scoring system, and how to apply their clinical reasoning within the structured framework of the assessment.⁵³

Limitations

The limitations of this study include the asynchronous data collection conducted outside an academic context which, as with many studies involving SCT, may have influenced the number of respondents. However, collecting data nationally and simultaneously from both clinical experts and other panelists helped reduce response contamination bias. Additionally, the fact that the type of instrument is relatively unknown in Portugal and was administered without prior training may have affected both participation rates and the respondents’ understanding of the tool.

This study is crucial for nursing practice, offering valuable insights into assessing clinical reasoning in uncertain situations, particularly in postanesthesia care settings, while emphasizing the importance of specialized postgraduate training and context-specific education to optimize clinical reasoning under uncertainty. It can inform the development of targeted educational strategies and fellowship programs aimed at enhancing postanesthesia nurses’ clinical reasoning skills.

While the results show a clear distinction in score distributions, they do not yet allow for inferences about what constitutes “weak” or “strong” clinical reasoning in absolute terms. Further research is needed to determine expected score ranges across different experience levels, such as student nurses or early-career professionals, to support the tool’s broader educational application.

Conclusion

The PaNSCT shows promise as a tool for assessing clinical reasoning under uncertainty among perioperative nurses. The results suggest that specialized experience, particularly in PACU, plays a significant role in shaping clinical reasoning skills and highlights the potential of the PaNSCT to improve ongoing education and training in postanesthesia nursing care. With further refinement and broader application, the PaNSCT could serve as a valuable tool in nursing education, fostering the development of expert clinical reasoning skills essential for managing uncertainty in clinical practice.

Future studies could investigate the integration of PaNSCT into perioperative master’s programs, its application alongside other innovative teaching strategies in pre- and postgraduate training, as well as its role in in-service training contexts, such as the onboarding of new nurses and performance evaluations.

CRediT authorship contribution statement

Márcia Pestana-Santos: Writing – review & editing, Validation, Supervision, Methodology, Investigation, Formal analysis, Conceptualization. **Lurdes Lomba:** Writing – review & editing, Validation, Supervision, Formal analysis, Conceptualization. **Margarida Reis Santos:** Writing – review & editing, Validation, Supervision, Methodology, Formal analysis, Conceptualization. **Lara Daniela Matos Cunha:** Writing – review & editing, Writing – original draft, Software, Resources, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Pardis Rahmatpour:** Writing – review & editing,

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L.D.M. Cunha et al.

Journal of PeriAnesthesia Nursing xxx (xxxx) xxx–xxx

Validation, Supervision, Methodology, Formal analysis, Data curation. **Filipa Ventura:** Writing – review & editing, Validation, Supervision, Methodology, Formal analysis, Conceptualization.

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Declaration of Competing Interest

None to report.

Appendix A. Supplementary Materials

Supplementary material associated with this article can be found in the online version at doi:10.1016/j.jopan.2025.07.003.

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L.D.M. Cunha et al.

Journal of PeriAnesthesia Nursing xxx (xxxx) xxx–xxx

Appendix A. Supplementary Materials

Postanesthesia Nursing Script Concordance Test (PaNSCT)

1. Clinical Case Description: A 72-year-old female who fell from her own height at home, resulting in a left trochanteric fracture. She underwent proximal femoral nail antirotation surgery under spinal anesthesia. Upon arrival at the postanesthesia care unit (PACU), she presents with Bromage 2. She is agitated but “without pain.”

If You Are Considering...	And You Find...	The Hypotheses Will Become...				
Item 1—Assess the bladder globe	Defense to palpation above the pubic area	–2	–1	0	+1	+2
Item 2—Assess pain using Pain Assessment in Advanced Dementia scale	Facial expression frowning, tense body language, and occasional loud groaning	–2	–1	0	+1	+2
Item 3—Investigate personal history of dementia syndrome	Personal history of dyslipidemia and arterial hypertension	–2	–1	0	+1	+2
Investigation action	New information	Likert scale (5 points)				

–2, strongly contraindicated; –1, contraindicated; 0, neither indicated nor contraindicated; +1, indicated; +2, strongly indicated.

2. Clinical Case Description: A 34-year-old male, American Society of Anesthesiologists (ASA Physical Status Classification System) I, underwent a Whipple procedure. The intraoperative anesthetist reports that the patient is “very sleepy, difficult to awaken.” Neuromuscular blockade was reversed with 400 mg of Sugammadex intravenously. Upon arrival at the PACU, he is assessed with a Ramsay score of 5.

If You Are Considering...	And You Find...	The Hypotheses Will Become...				
Item 1—Perform arterial blood gas analysis	pCO ₂ 42 mm Hg	–2	–1	0	+1	+2
Item 2—Assess capillary blood glucose	Capillary blood glucose 36 mg/dL	–2	–1	0	+1	+2
Item 3—Investigate opioid administration in the intraoperative phase	0.15 mg fentanyl IV during anesthesia induction	–2	–1	0	+1	+2
Investigation action	New information	Likert scale (5 points)				

IV, intravenous.

–2, strongly contraindicated; –1, contraindicated; 0, neither indicated nor contraindicated; +1, indicated; +2, strongly indicated.

3. Clinical Case Description: A 42-year-old female with a medical history of overweight and Obstructive Sleep Apnea Syndrome. She underwent clipping of a cerebral aneurysm in the posterior communicating artery. Initial neurological assessment: Glasgow Coma Scale 13 (E3, V4, M6), anisocoric pupils (right eye with reactive mydriasis), right ptosis, and right exotropia.

If You Are Considering...	And You Find...	The Hypotheses Will Become...				
Item 1—Investigate preoperative neurological status	Surgical report of damage to the third cranial nerve (oculomotor)	–2	–1	0	+1	+2
Item 2—Assess cerebral perfusion pressure	Intracranial pressure of 3 mm Hg and mean arterial pressure of 85 mm Hg	–2	–1	0	+1	+2
Item 3—Assess for the presence of Urrets-Zavalía syndrome	Recent administration of atropine IV	–2	–1	0	+1	+2
Investigation action	New information	Likert scale (5 points)				

IV, intravenous.

–2, strongly contraindicated; –1, contraindicated; 0, neither indicated nor contraindicated; +1, indicated; +2, strongly indicated.

4. Clinical Case Description: A 56-year-old male with a history of deep vein thrombosis in the left lower limb 10 years ago. He underwent a laparoscopic cholecystectomy. He presents with nonspecific complaints of “pain in the left shoulder.”

If You Are Considering...	And You Find...	The Hypotheses Will Become...				
Item 1—Insufficient drainage of pneumoperitoneum	Kehr's signal	–2	–1	0	+1	+2
Item 2—Evaluate the electrocardiographic trace	Sinus rhythm with a heart rate of 89 beats per minute	–2	–1	0	+1	+2
Item 3—Investigate the infusion of Ringer's lactate in the subphrenic space during the intraoperative period	Administration of 500 mL of Ringer's lactate via the trocar in the right hypochondrium	–2	–1	0	+1	+2
Investigation action	New information	Likert scale (5 points)				

–2, strongly contraindicated; –1, contraindicated; 0, neither indicated nor contraindicated; +1, indicated; +2, strongly indicated.

ARTICLE IN PRESS

L.D.M. Cunha et al.

Journal of PeriAnesthesia Nursing xxx (xxxx) xxx–xxx

5. Clinical Case Description: A 70-year-old male weighing 70 kg with a history of chronic kidney disease underwent a ureterectomy. Fifteen minutes after admission to the PACU, he experiences respiratory arrest. Endotracheal intubation is performed, and assisted ventilation is provided using a manual resuscitation bag with oxygen at 15 L/min.

If You Are Considering...	And You Find...	The Hypotheses Will Become...				
Item 1—Administer 240 mg s-ugammadex IV	Train-of-four evaluation = 0.3	-2	-1	0	+1	+2
Item 2—Monitor fluid balance	Intraoperative administration of 1,000 cc of crystalloids, 2 units of packed red blood cells, and 2 vials of 20% albumin. Estimated blood loss of 250 cc. Oligoanuria.	-2	-1	0	+1	+2
Item 3—Assess for edema	Pitting edema grade IV	-2	-1	0	+1	+2
Investigation action	New information	Likert scale (5 points)				

-2, strongly contraindicated; -1, contraindicated; 0, neither indicated nor contraindicated; +1, indicated; +2, strongly indicated.

6. Clinical Case Description: A 54-year-old male with a medical history of smoking, arterial hypertension, and dyslipidemia underwent a left carotid endarterectomy. Carotid clamping time was 40 minutes. He experienced a hypertensive peak (220/110 mm Hg), which was managed with dihydralazine and esmolol. He presents with right monoplegia, predominantly brachial.

If You Are Considering...	And You Find...	The Hypotheses Will Become...				
Item 1—Assess cerebral oximetry with INVOS	Right cerebral oximetry 67%, left cerebral oximetry 69%	-2	-1	0	+1	+2
Item 2—Evaluate pupil size and reactivity	Pupils are isocoric (2/2 mm) and equally reactive	-2	-1	0	+1	+2
Item 3—Assess cerebral oximetry with INVOS	Ipsilateral rSO ₂ decrease of 10%	-2	-1	0	+1	+2
Investigation action	New information	Likert scale (5 points)				

-2, strongly contraindicated; -1, contraindicated; 0, neither indicated nor contraindicated; +1, indicated; +2, strongly indicated.

7. Clinical Case Description: A 42-year-old female with a history of anxiety disorder underwent a total thyroidectomy. One hour after admission to the PACU, she reports “numbness” around the perioral mucosa.

If You Are Considering...	And You Find...	The Hypotheses Will Become...				
Item 1—Assess paresthesia	Positive Trousseau sign	-2	-1	0	+1	+2
Item 2—Evaluate electrocardiographic trace	Prolonged QT segment	-2	-1	0	+1	+2
Item 3—Handling a medical allergy history	History of syncope after administration of metimazole	-2	-1	0	+1	+2
Investigation action	New information	Likert scale (5 points)				

-2, strongly contraindicated; -1, contraindicated; 0, neither indicated nor contraindicated; +1, indicated; +2, strongly indicated; QT, time from the start of the Q wave to the end of the T wave, time taken for ventricular depolarisation and repolarisation.

8. Clinical Case Description: A 47-year-old female with a history of cervical hernia underwent anterior cervical arthrodesis. After endotracheal extubation, she developed respiratory stridor and desaturation (SpO₂ 81% with a Venturi mask at 45%). Following reintubation, she was transferred to the PACU with a T-piece and oxygen therapy at 8 L/min.

If You Are Considering...	And You Find...	The Hypotheses Will Become...				
Item 1—Perform airway patency test	Qualitative cuff leak test negative	-2	-1	0	+1	+2
Item 2—Assess cough	Ineffective cough	-2	-1	0	+1	+2
Item 3—Administer intravenous corticosteroid therapy	No signs suggestive of anaphylaxis (eg, arterial hypotension, altered level of consciousness)	-2	-1	0	+1	+2
Investigation action	New information	Likert scale (5 points)				

-2, strongly contraindicated; -1, contraindicated; 0, neither indicated nor contraindicated; +1, indicated; +2, strongly indicated.

9. Clinical Case Description: A 67-year-old male with a history of arterial hypertension, type 2 diabetes mellitus, smoking (> 40 pack-years), dyslipidemia, and peripheral arterial obstructive disease underwent femoropopliteal bypass surgery. Upon admission to the PACU, he was hypothermic, and passive warming measures were implemented.

If You Are Considering...	And You Find...	The Hypotheses Will Become...				
Item 1—Assess peripheral capillary perfusion	Cold extremities, acrocyanosis, and intense pain (Qualitative Scale)	-2	-1	0	+1	+2
Item 2—Assess peripheral pulses and arterial thrill	Absent posterior tibial pulse	-2	-1	0	+1	+2
Item 3—Conduct anamnesis	History of Raynaud's syndrome	-2	-1	0	+1	+2
Investigation action	New information	Likert scale (5 points)				

-2, strongly contraindicated; -1, contraindicated; 0, neither indicated nor contraindicated; +1, indicated; +2, strongly indicated.

ARTICLE IN PRESS

L.D.M. Cunha et al.

Journal of PeriAnesthesia Nursing xxx (xxxx) xxx–xxx

10. Clinical Case Description: A 27-year-old male, ASA I, with a medical history of pelvic osteosarcoma, underwent a left hemipelvectomy (12-hour operative time). Upon admission to the PACU, he presented with shivering, cold extremities, and piloerection.

If You Are Considering...	And You Find...	The Hypotheses Will Become...				
Item 1—Implement active warming measures with forced-air warming devices	Sublingual temperature of 35.5 °C	-2	-1	0	+1	+2
Item 2—Assess the patient's comfort level	Agitation and expression of discomfort	-2	-1	0	+1	+2
Item 3—Check the ambient temperature of the unit	Unit temperature > 24 °C	-2	-1	0	+1	+2
Investigation action	New information	Likert scale (5 points)				

-2, strongly contraindicated; -1, contraindicated; 0, neither indicated nor contraindicated; +1, indicated; +2, strongly indicated.

11. Clinical Case Description: A 34-year-old female with a history of autism spectrum disorder underwent eight mandibular and maxillary extractions. Inhalational anesthesia induction was performed with a facial mask, followed by nasal intubation with a size 5.5 endotracheal tube without complications. Right periorbital edema was identified. After extubation, there were no signs of airway obstruction. In the PACU, the edema extended to the right facial and supraclavicular regions.

If You Are Considering...	And You Find...	The Hypotheses Will Become...				
Item 1—Observe tracheal positioning	Deviation of the trachea from the midline	-2	-1	0	+1	+2
Item 2—Assess signs of jugular vein distension	Kussmaul's sign absent	-2	-1	0	+1	+2
Item 3—Palpate the cervical region	Presence of crepitus	-2	-1	0	+1	+2
Investigation action	New information	Likert scale (5 points)				

-2, strongly contraindicated; -1, contraindicated; 0, neither indicated nor contraindicated; +1, indicated; +2, strongly indicated.

12. Clinical Case Description: A 57-year-old female with a history of arterial hypertension and type 2 diabetes mellitus underwent anterior rectal resection with colorectal anastomosis, performed in the Trendelenburg position. Upon admission to the recovery room, she reports blurry vision, photophobia, ocular pain, and a sensation of a foreign body in the left eye.

If You Are Considering...	And You Find...	The Hypotheses Will Become...				
Item 1—Examine the eyeball	No foreign body detected	-2	-1	0	+1	+2
Item 2—Assess pupillary reactivity	Pupils reactive and symmetric	-2	-1	0	+1	+2
Item 3—Apply anesthetic eye drops	No ocular pain 2 min after administration	-2	-1	0	+1	+2
Investigation action	New information	Likert scale (5 points)				

-2, strongly contraindicated; -1, contraindicated; 0, neither indicated nor contraindicated; +1, indicated; +2, strongly indicated.

13. Clinical Case Description: A 73-year-old male with a history of smoking and rectal adenocarcinoma (initial staging T3N1M0), treated with neoadjuvant chemoradiotherapy. He underwent abdominoperineal amputation with the creation of a colostomy under the Enhanced Recovery After Surgery program. Upon admission to the PACU, he presents with an episode of intractable vomiting.

If You Are Considering...	And You Find...	The Hypotheses Will Become...				
Item 1—Assess stoma output	Traces of liquid stool	-2	-1	0	+1	+2
Item 2—Assess the stoma	Irreducible stoma prolapse	-2	-1	0	+1	+2
Item 3—Assess stoma coloration	Stoma is pink, shiny, and hydrated	-2	-1	0	+1	+2
Investigation action	New information	Likert scale (5 points)				

-2, strongly contraindicated; -1, contraindicated; 0, neither indicated nor contraindicated; +1, indicated; +2, strongly indicated.

14. Clinical Case Description: An 83-year-old male with a history of atrial fibrillation, ischemic stroke with left hemiparesis (grade 3 sequelae). He underwent exploratory laparotomy for acute mesenteric ischemia (occlusive). He was transferred to the PACU on invasive mechanical ventilation and inotropic support.

If You Are Considering...	And You Find...	The Hypotheses Will Become...				
Item 1—Assess skin coloration	Mottling score of 5	-2	-1	0	+1	+2
Item 2—Optimize venous access	16-gauge peripheral venous catheter in the left antecubital fossa	-2	-1	0	+1	+2
Item 3—Elevate lower extremities passively	Mean arterial pressure 55 mm Hg	-2	-1	0	+1	+2
Investigation action	New information	Likert scale (5 points)				

-2, strongly contraindicated; -1, contraindicated; 0, neither indicated nor contraindicated; +1, indicated; +2, strongly indicated.

ARTICLE IN PRESS

L.D.M. Cunha et al.

Journal of PeriAnesthesia Nursing xxx (xxxx) xxx-xxx

15. Clinical Case Description: A 77-year-old male with a history of type 2 diabetes mellitus complicated by nephropathy and diabetic neuropathy. He underwent right supracondylar amputation due to peripheral vasculopathy. Upon admission to the PACU, reactive hyperemia is noted in the left gluteal region.

If You Are Considering...	And You Find...	The Hypotheses Will Become...				
Item 1—Assess skin	A medical device is found with a shape corresponding to the silhouette of the lesion	-2	-1	0	+1	+2
Item 2—Optimize diaper use	Skin is damp	-2	-1	0	+1	+2
Item 3—Monitor bowel elimination	Abundant liquid stool	-2	-1	0	+1	+2
Investigation action	New information	Likert scale (5 points)				

-2, strongly contraindicated; -1, contraindicated; 0, neither indicated nor contraindicated; +1, indicated; +2, strongly indicated.

16. Clinical Case Description: A 50-year-old male with a history of obesity (body mass index 35), dyslipidemia, obstructive sleep apnea syndrome, and fatty liver disease. He underwent laparoscopic Roux-en-Y gastric bypass. During the first hour of stay in the PACU, he continues to experience hyperalgesia despite increasing analgesic therapy.

If You Are Considering...	And You Find...	The Hypotheses Will Become...				
Item 1—Palpate the abdomen	Positive Blumberg sign	-2	-1	0	+1	+2
Item 2—Monitor blood loss	Multidrain with a cumulative 250 cc of hematic content	-2	-1	0	+1	+2
Item 3—Assess intra-abdominal pressure	Intra-abdominal pressure = 10 mm Hg	-2	-1	0	+1	+2
Investigation action	New information	Likert scale (5 points)				

-2, strongly contraindicated; -1, contraindicated; 0, neither indicated nor contraindicated; +1, indicated; +2, strongly indicated.

17. Clinical Case Description: A 67-year-old female with a history of cachexia and cervical carcinoma with invasion of the bladder and rectal mucosa. She underwent exenterative surgery. She has been oliguric since admission to the PACU.

If You Are Considering...	And You Find...	The Hypotheses Will Become...				
Item 1—Administer 250 cc of poly-electrolyte solution intravenously over 15 min	Maintenance of hemodynamic profile	-2	-1	0	+1	+2
Item 2—Monitor drainage fluid	Multidrain with 500 cc of dark yellow content, warm to the touch	-2	-1	0	+1	+2
Item 3—Optimize urinary catheter	Urinary catheter is unobstructed	-2	-1	0	+1	+2
Investigation action	New information	Likert scale (5 points)				

-2, strongly contraindicated; -1, contraindicated; 0, neither indicated nor contraindicated; +1, indicated; +2, strongly indicated.

18. Clinical Case Description: A 32-year-old female undergoing elective cesarean section due to arteriovenous malformation under neuroaxial anesthesia. She reports headaches (pain level = 8 on a numerical pain scale) after the first hour of anesthetic recovery.

If You Are Considering...	And You Find...	The Hypotheses Will Become...				
Item 1—Monitor blood pressure	BP 115/59 mm Hg	-2	-1	0	+1	+2
Item 2—Optimize positioning	Exacerbation of symptoms with orthostatism	-2	-1	0	+1	+2
Item 3—Assess neurological status	GCS 15 (E4, V5, M6), pupils isocoric/isocoric, no motor deficit	-2	-1	0	+1	+2
Investigation action	New information	Likert scale (5 points)				

-2, strongly contraindicated; -1, contraindicated; 0, neither indicated nor contraindicated; +1, indicated; +2, strongly indicated; BP, blood pressure; GCS, Glasgow Coma Scale.

19. Clinical Case Description: Male, 18 years old, with a personal history of Wolff-Parkinson-White syndrome, underwent endovascular ablation with radiofrequency. Upon entry to the PACU, he developed tachypnea and precordial pain.

If You Are Considering...	And You Find...	The Hypotheses Will Become...				
Item 1—Monitor electrocardiography with 5 leads	Tachycardia with wide QRS complexes and rapid ventricular response (HR = 186 bpm)	-2	-1	0	+1	+2
Item 2—Encourage family support (presence of mother)	Emotional coregulation	-2	-1	0	+1	+2
Item 3—Auscultate heart sounds	Beck's triad is absent	-2	-1	0	+1	+2
Investigation action	New information	Likert scale (5 points)				

-2, strongly contraindicated; -1, contraindicated; 0, neither indicated nor contraindicated; +1, indicated; +2, strongly indicated; QRS, A combination of the Q wave, R wave and S wave, the "QRS complex" represents ventricular depolarization.

ARTICLE IN PRESS

L.D.M. Cunha et al.

Journal of PeriAnesthesia Nursing xxx (xxxx) xxx-xxx

20. Clinical Case Description: Male, 18 years old, with a personal history of gender dysphoria, underwent bilateral mastectomy. Spent 2 hours in the PACU and is proposed for discharge to the ward with a score of 10 on the Modified Aldrete Index. The responsible nurse prepares for transfer.

If You Are Considering...	And You Find...	The Hypotheses Will Become...				
Item 1—Monitor drain	Vacuum drain with blood traces	-2	-1	0	+1	+2
Item 2—Assess surgical dressing	Saturated dressing with blood content, pain, and edema around the surgical wound	-2	-1	0	+1	+2
Item 3—Prepare bedpan	No spontaneous urination and tenderness on palpation above the pubic area	-2	-1	0	+1	+2
Investigation action	New information	Likert scale (5 points)				

-2, strongly contraindicated; -1, contraindicated; 0, neither indicated nor contraindicated; +1, indicated; +2, strongly indicated.

Capítulo IV

Estratégias para a Gestão da Incerteza no Raciocínio Clínico dos Enfermeiros das Unidade de Cuidados Pós-anestésicos: Mapeamento e Consenso de Peritos para Adequação ao Contexto

Este capítulo inclui 1 manuscrito submetido para revisão por pares,
2 manuscritos publicados

Disseminação

Palestra a Convite

Cunha, L.D.M. (2025). Palestrante convidado no Painele “O peri-operatório como fator crítico na qualidade do cuidado cirúrgico” com o tema “Ferramentas cognitivas para o raciocínio clínico em enfermagem avançada”. Congresso Internacional do Núcleo de Enfermeiros Especialistas em Médico-Cirúrgica da ULS Baixo Mondego ‘Intervir e Valorizar’, Figueira da Foz.

Resumos em atas de eventos científicos

Cunha, L.D.M., Pestana-Santos, M., Lomba, L., & Reis Santos, M. (2025). Estratégias de Decisão à Cabeceira do Doente para Apoiar o Raciocínio Clínico: uma revisão scoping. Abstract Book of *NursID Spring School 2025*, Porto. [no prelo]

Cunha, L.D.M., Pestana-Santos, M., Lomba, L., & Reis Santos, M. (2024). Cognitive Aids for Nursing Clinical Reasoning: a scoping review”. Abstract Book of *10th Sigma European PhD Virtual Connect Conference 2024 ‘Bridging Nursing Leadership, Research & Practice: Promoting Equity in Healthcare’*, Uppsala.

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Cunha, L.D.M., Pestana-Santos, M., Lomba, L., & Reis Santos, M. (2024). Cognitive Aids for Nursing Clinical Reasoning: a scoping review. *10th Sigma European PhD Virtual Connect Conference 2024 ‘Bridging Nursing Leadership, Research & Practice: Promoting Equity in Healthcare’*, Uppsala.

MANUSCRITO 6: Decision support strategies for bedside nursing clinical reasoning: A scoping review protocol

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Decision support strategies for bedside nursing clinical reasoning: A scoping review protocol

Estratégias de apoio à decisão para o raciocínio clínico de enfermagem à beira do leito: Um protocolo de revisão de escopo

Estrategias de apoyo a la decisión para el razonamiento clínico de enfermería en el punto de atención: Protocolo de revisión de alcance

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Abstract

The aim of this scoping review is to map the evidence on self-instructed bedside decision strategies applied by nurses to support clinical reasoning. The ability to perform solid clinical reasoning is essential for providing healthcare with favourable patient outcomes. Accordingly, nurses should play an active role in developing clinical reasoning skills. Bedside support strategies are intended to be pragmatic, invaluable, and easy-to-apply resources to restructure cognitive processes when the clinical demands are complex. This review will consider studies that focus on bedside decision strategies, context-suitable, and practical to apply, self-instructed by nurses aimed to support nursing clinical reasoning. Studies focused on educational content, clinical case-specific studies, and studies related to software applications development or artificial intelligence will be excluded. The methodology will follow the JBI recommendations for scoping reviews. All published and unpublished sources of relevant evidence will be considered. Studies published in Portuguese, English, Spanish or Swedish will be included, without geographical or cultural limitations. Duplicates will be removed, and two independent reviewers will screen the abstracts and appraise the full text of the selected studies, based on the inclusion criteria. The results of the study selection will be summarized in a flowchart adapted from Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA). The overview of datasets will be presented in a narrative summary to provide a description of the existing evidence.

Keywords: Clinical problem-solving; Clinical reasoning; Decision-making; Decision support; Nursing.

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Resumo

O objetivo desta revisão de escopo é mapear a evidência sobre as estratégias de decisão autoinstruídas no local de atendimento aplicadas por enfermeiros para apoiar o raciocínio clínico. A capacidade de realizar um raciocínio clínico sólido é crucial para garantir cuidados de saúde com resultados favoráveis para os pacientes. Os enfermeiros devem desenvolver ativamente essas competências. As estratégias de apoio no local de atendimento são recursos pragmáticos, valiosos e fáceis de aplicar, que ajudam a reestruturar processos cognitivos em situações clínicas complexas. Esta revisão considerará estudos que se concentrem em estratégias de decisão no local de atendimento, adequadas ao contexto e práticas de aplicar, autoinstruídas por/para enfermeiros e destinadas a apoiar o raciocínio clínico em enfermagem. Serão excluídos os estudos centrados em conteúdo educativo, estudos específicos de casos clínicos e estudos relacionados com o desenvolvimento de aplicações de software ou inteligência artificial. A metodologia seguirá as recomendações do JBI para revisões de escopo. Serão consideradas todas as fontes publicadas e não publicadas de evidência relevante. Serão incluídos estudos publicados em português, inglês, espanhol ou sueco, sem limitações geográficas ou culturais. Serão removidos os duplicados, dois revisores independentes analisarão os resumos e avaliarão o texto completo dos estudos selecionados, com base nos critérios de inclusão. Os resultados da seleção de estudos serão resumidos num diagrama de fluxo adaptado dos Itens de Relatório Preferidos para Revisões Sistemáticas e Meta-Análises (PRISMA). Os resultados serão apresentados num resumo narrativo para fornecer uma descrição da evidência existente.

Palavras-chave: Resolução de problemas; Raciocínio clínico; Tomada de decisões; Técnicas de apoio para a decisão; Enfermagem.

Resumen

El objetivo de esta revisión de alcance es mapear la evidencia sobre las estrategias de decisión autoinstruidas en el punto de atención aplicadas por enfermeras para apoyar el razonamiento clínico. La capacidad de realizar un razonamiento clínico sólido es crucial para asegurar una atención médica efectiva y favorable para los pacientes. Las enfermeras deben jugar un rol activo en el desarrollo de estas habilidades. Las estrategias de apoyo en el punto de atención son herramientas prácticas, invaluablemente útiles y de fácil aplicación que permiten reorganizar los procesos cognitivos en situaciones clínicas complejas. Esta revisión considerará estudios que se centren en estrategias de decisión en el punto de atención, adecuadas al contexto y prácticas de aplicar, autoinstruidas por enfermeras y destinadas a apoyar el razonamiento clínico en enfermería. Se excluirán los estudios centrados en contenido educativo, estudios específicos de casos clínicos y estudios relacionados con el desarrollo de aplicaciones de software o inteligencia artificial. La metodología seguirá las recomendaciones del JBI para revisiones de alcance. Se considerarán todas las fuentes publicadas y no publicadas de evidencia relevante. Se incluirán estudios publicados en portugués, inglés, español o sueco, sin limitaciones geográficas o culturales. Se eliminarán los duplicados, y dos revisores independientes revisarán los resúmenes y evaluarán el texto completo de los estudios seleccionados, basándose en los criterios de inclusión. Los resultados de la selección de estudios se resumirán en un diagrama de flujo adaptado de los elementos de referencia preferidos para revisiones sistemáticas y metanálisis (PRISMA). Los conjuntos de datos se presentará en un resumen narrativo para proporcionar una descripción de la evidencia existente.

Palabras clave: Resolución de problemas clínicos; Razonamiento clínico; Toma de decisiones; Apoyo a la decisión; Enfermería.

1. Introduction

Clinical reasoning (CR) reflects the cognitive process and the result of sustained thinking that a healthcare providers uses to solve and manage a clinical problem (Young et al., 2020). It is defined as "*a complex cognitive process that uses formal and informal thinking strategies to gather and analyse patient information, evaluate the significance of this information and weigh alternative actions*" (Simmons, 2010, p. 1155). Effective, high-quality CR requires broad evidence-based knowledge and the ability to isolate relevant healthcare-related information to ensure that decision-making positively impact patient care (Dissanayake et al., 2020).

Complex clinical decision-making has become the standard for current nursing practice. The diversity of care experiences and the fast pace of clinical care place nurses in difficult circumstances, in which solid CR must be demonstrated from the outset of their professional practice (Ludin, 2018). A continuous improvement of CR skills is thus required to ensure their usefulness in clinical problem-solving. The Dual Process Theory Reasoning Model (DPTRM) (Pelaccia et al., 2011) and The Conscious Competence Model (Gruppetta & Mallia, 2020) are some theoretical frameworks useful to assist the CR process.

Thus, DPTRM (Pelaccia et al., 2011) appears as a moderator of cognitive processes interconnected with learning/memory, which may influence judgments and behaviors through two distinct processes: non-analytical clinical reasoning (an abductive, intuitive, pattern-recognition and automatic assimilation mode of processing that normally exists outside of consciousness and has the advantage of requiring little effort) and analytical clinical reasoning (a rule-based inference mode of processing that requires greater cognitive effort). As these processes can be simultaneous and difficult to dissociate, they can lead healthcare providers to unintentional reasoning bias related to limited professional experience, overconfidence in pattern recognition, limited cognitive flexibility related to exposure to the *status quo*, the ageing process associated with a loss of analytical reasoning and a greater reliance on heuristics and emotions (Croskerry, 2009). Additionally, The Conscious Competence Model (Gruppetta & Mallia, 2020), which addresses the path of competence and learning in clinical practice, considers the beginning stage to be simultaneously unconscious and incompetent. Once an individual is unable to assess their own competence in professional practice, it is possible to maintain their performance and not evolve in the process of reasoning and learning (Keeley, 2021). Alongside these reasoning processes, it is essential to consider the use of specific strategies to support CR that can be applied pragmatically and easily in daily clinical situations.

Training CR skills is a challenge due to the complex and tacit nature of professional practice performance and the ongoing controversies over the best means of teaching and developing it (Huesmann et al., 2023). The inadequacy of its acquisition and the lack of continuous training led to an increase in the rate of clinical errors, which is a major challenge for health systems around the world (Sudacka et al., 2021). Furthermore, in an international survey that assessed specific needs in CR training, 85% of respondents highlighted an unmet need for a longitudinal CR curriculum and identified shortcomings in terms of CR teaching strategies and the prevention of cognitive errors (Kononowicz et al., 2020). The most common perceived barriers were a lack of awareness of the need for explicit CR teaching, a lack of guidelines for curriculum development and a lack of qualified instructors (Kononowicz et al., 2020). Thus, DID-ACT was founded, a project that aims to develop, implement, and disseminate an adaptive CR curriculum for students and health educators (Kononowicz et al., 2020).

Most of the evidence produced concerns support for undergraduate students' CR. A review explored the teaching strategies used to promote CR in nursing education (Tyó & McCurry, 2019). Strategies included simulation, active learning strategies (case studies, reflection, journaling, and collaborative learning), teaching strategies (think aloud or case studies with simulation) and clinical experiences. Also, another review identified the Outcome-Present Test (OPT) Model, Interactive Computer Decision Support, Think Aloud, Debriefing for Meaningful Learning, Developing Nurses' Thinking, SAFETY, Lasaster Clinical Judgment, Virtual patient Nursing Design Model, Newman's Health Expanding Consciousness theory, and IRUEPIC (Identify, Relate, Understand, Explain, Predict, Influence, and Control) (Tyó & McCurry, 2019). Although these teaching strategies can be useful in facilitating the development of nursing students' CR skills, they should be part of an overall curricular approach to continuing professional education (Mlambo et al., 2021).

Contemporary intellectual tools to support individualized diagnosis are focused on Computerized Clinical Decision Support Systems (CCDSSs), which algorithmically use an electronic data knowledge base to generate and present recommendations for clinical action (Ortiz et al., 2017). However, these systems still lack the increased availability of computing technology and do not tackle immediacy to match the workflow per se (Piscotty Jr et al., 2015). Since clinical practice requires quick and pragmatic decision-making, it is important to map out strategies that can be implemented in clinical settings without cost or additional time to nursing practice.

Giuffrida and colleagues (Giuffrida et al., 2023) stated macro strategies used to teach CR in advanced clinical practice, namely simulations-based education, visual intelligence training, and other learning activities such as gamification and case-based discussion. These methodologies are worth mentioning as initial efforts to support CR, however, system strategies have not addressed concerns at the individual nurse level. Nurses offers a unique perspective for identifying gaps in

practice, developing, evaluating, and implementing solutions, as a unique profession with a continuous presence at the patient's bedside (Mulkey, 2021).

This scoping review is expected to provide an overview of the evidence focused on decision strategies that can be applied pragmatically at the bedside, given the potential impact on clinical nursing practice to address clinical challenges quickly and distinctively. With the current demands imposed by the nursing workflow, the rapid integration of newly graduates into the workplace, the constraints of peer support regarding the nurse-patient ratio, bedside strategies could be considered a valuable resource. A preliminary search of MEDLINE, the Cochrane Database of Systematic Reviews, and JBI Evidence Synthesis was conducted on October 23, 2023, and no current or in-progress review on the topic was identified.

The aim of this scoping review is to map the evidence on self-instructed bedside decision strategies applied by nurses to support clinical reasoning. The proposed scoping review will inform the conduct of further research, including primary studies, and help review work that may involve the conduct of a systematic review to determine the effectiveness of supporting decision strategies of clinical reasoning at bedside, context-suitable, and practical to apply during the provision of nursing care.

2. Methodology

The proposed scoping review will be conducted in accordance with the JBI methodology for scoping reviews (Peters et al., 2017) and reported in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR). (Tricco et al., 2018). This scoping review protocol is registered in Open Science Framework (<https://doi.org/10.17605/OSF.IO/H96VQ>).

2.1 Review question(s)

What is the evidence on self-instructed bedside decision strategies applied by nurses to support clinical reasoning?

Additionally, the review will also address the following questions:

- I. What are the key concepts, theories, or definitions scaffolding decision strategies to support clinical reasoning in the provision of nursing care?
- II. What are the clinical contexts in which decision strategies to support clinical reasoning are being developed/applied?
- III. What are the assessed outcomes of decision strategies to support clinical reasoning in the provision of nursing care?

2.2 Inclusion criteria

2.2.1 Participants

This review will consider studies that include nurses, alone or within multidisciplinary teams, including those from culturally and linguistically diverse backgrounds, of any professional level or academic background.

2.2.2 Concept

This review will consider studies that explored the concept of clinical reasoning referring to nursing practice, and used one or several decision support strategies, such as techniques, methods, approaches, interventions, or resources. This includes the suitability of knowledge, the ability to gather appropriate patient data, the employment of appropriate and specific reasoning strategies, as well as the ability to reflect on and evaluate the decisions undertaken (Gruppetta & Mallia, 2020). The review may include, but is not limited to, the different stages of the clinical reasoning process: assessing, planning,

implementing, and evaluating. Decision support strategies provided online or digitally will be considered. Studies focused on educational content, and clinical case-specific studies will be excluded. Studies on the development process of software applications or artificial intelligence will also be excluded.

2.2.3 Context

There will be no exceptions of healthcare settings and geographic area for consideration. As the context is transversal to all clinical scenarios, it will not be operationalized in the Boolean search.

2.2.4 Types of sources

The review will consider both experimental and quasi-experimental study designs including randomized controlled trials, non-randomized controlled trials, before and after studies and interrupted time-series studies. In addition, analytical observational studies including prospective and retrospective cohort studies, case-control studies and analytical cross-sectional studies will be considered for inclusion. Qualitative studies will also be considered that focus on qualitative data including designs such as phenomenology, grounded theory, ethnography, qualitative description, and action research.

The review will also consider descriptive epidemiological study designs including case series, individual case reports and descriptive cross-sectional studies, thesis, dissertations, and grey literature for inclusion. Systematic reviews that meet the inclusion criteria will also be considered, depending on the research question. Reports and opinion papers will also be considered.

2.3 Search strategy

An initial limited search of MEDLINE (PubMed) and CINAHL (EBSCOhost) was undertaken to identify articles on the topic. The text words contained in the titles and abstracts of relevant articles, and the index terms used to describe the articles were used to develop a full search strategy for MEDLINE via PubMed (Table 1). The search strategy, including all identified keywords and index terms, will be adapted for each included information source.

No language restrictions will be made at title and abstract screening. At full text, articles published in Portuguese, English, Spanish or Swedish will be included, as these languages are spoken by our review team.

The search will not be limited by a specific timeframe.

Table 1 - Search strategy to Medline (PubMed) on October 23, 2023.

Search	Query	Records retrieved
#1	((nurs*[Title/Abstract]) OR ("nursing care"[Title/Abstract])) OR (nursing[MeSH Terms])	663,625
#2	(((((("clinical reasoning"[MeSH Terms]) OR ("Clinical decision-making"[MeSH Terms])) OR ("clinical judgment"[Title/Abstract])) OR ("critical thinking"[Title/Abstract])) OR ("cognitive processing"[Title/Abstract])) OR ("knowledge adequacy"[Title/Abstract])) OR (reasoning[Title/Abstract])) OR ("clinical relevance"[Title/Abstract])) OR ("decision-making"[Title/Abstract])) OR ("clinical decision-making"[Title/Abstract])) OR ("information-processing"[Title/Abstract])) OR ("clinical reasoning"[Title/Abstract]))	355,887
#3	(((((("Decision Support Techniques"[Majr:NoExp]) OR ("learning strategies"[Title/Abstract])) OR ("learning skills"[Title/Abstract])) OR ("decision support"[Title/Abstract])) OR ("information seeking behavior"[MeSH Terms])) OR ("information seeking behaviour"[Title/Abstract]))	51,137
#4	#1 AND #2 AND #3	867
Limited to #Portuguese, English, Spanish or Swedish		

Source: Authors (2024).

2.4 Study/Source of evidence

The search strategy will aim to locate both published and unpublished primary studies, reviews, and text and opinion papers. The following electronic databases will be searched from inception: MEDLINE (PubMed), CINAHL (EBSCOhost), Web of Science, Scopus, Cochrane CENTRAL, Cochrane Database of Systematic Reviews, and ProQuest Central (ProQuest). The following sources for unpublished studies and grey literature will be searched: Google Scholar, GreyNet, and RCAAP (Repositórios Científicos de Acesso Aberto de Portugal). The databank ScienceDirect will additionally be searched without a date limit. The reference lists of articles included in the review will be screened for additional papers.

2.5 Study/Source of evidence selection

Following the search, all identified records will be collated and uploaded into EndNote v.X9.1 (Clarivate Analytics, PA, USA) and duplicates removed. Following a pilot test, titles and abstracts will be screened in Rayyan (Qatar Computing Research Institute, Doha, Qatar) by three independent reviewers for assessment against the inclusion criteria for the review. Potentially relevant papers will be retrieved in full and their citation details imported into the JBI System for the Unified Management, Assessment and Review of Information (JBI SUMARI; JBI, Adelaide, Australia) (Munn et al., 2019). The full text of selected citations will be assessed in detail against the inclusion criteria by two or more independent reviewers. Reasons for exclusion of full-text papers that do not meet the inclusion criteria will be recorded and reported in the scoping review. Any disagreements that arise between the reviewers at each stage of the selection process will be resolved through discussion or with an additional reviewer. The results of the search will be reported in full in the final scoping review and presented in a PRISMA flow diagram (Page et al., 2021).

2.6 Data extraction

Data will be extracted from the studies included by two independent reviewers using a data extraction tool developed by the review team. The extracted data will include the inclusion and exclusion criteria, characteristics of nurses and midwives, characteristics of clinical reasoning support strategies, characteristics of healthcare context, and characteristics of the study relevant to the review question.

A draft data extraction tool is provided (Table 2) and will be modified and revised as necessary during the process of extracting data from each included study. Modifications will be detailed in the full scoping review. Any disagreements between the reviewers will be resolved through discussion or with a third reviewer. Authors of papers will be contacted to request missing or additional data, where required.

Table 2 – Data Extraction Instrument.

Scoping review title: Decision support strategies for bedside nursing clinical reasoning: a scoping review protocol.
Review objectives: To map the evidence on self-instructed bedside decision strategies applied by nurses to support clinical reasoning
Review Question: What is the evidence on self-instructed bedside decision strategies applied by nurses to support clinical reasoning?
Reviewer:
Date:
Inclusion criteria:
Population: Nurses, multidisciplinary (nurses included)
Other population characteristics: [instructor/beneficiary, professional level, length of professional practice, level of training]
Concept: Strategies for support clinical reasoning (techniques, methods, approaches, interventions, and resources)
Other strategies characteristics: [label, description, methods to apply, key concepts, theories, definitions, assessed outcomes]
Context: Clinical setting [hospital, community, virtual, other, please specify]
Other context characteristics: [healthcare domain]
Type of documents: empirical studies, policy, reports, guidelines
Details and characteristics of the analysed study
Citation details: [reference number, author(s), year of publication, title, source, volume, issue, pages]
Origin (publish or conducted):
Type of study: [primary research, systematic review, unpublished research]
Sample size:
Aim/purpose:
Methods:
Results:
Gaps identified in the documents:
Other key findings that relate to the scoping review question(s):
Comments:

Source: Authors (2024).

2.7 Data analysis and presentation

The extracted data will be presented in tabular format. Firstly, the features of the included studies will be presented, such as author(s), year of publication, title, source, volume, issue, pages, origin, type of study, sample size, aim/purpose, methods, and results. Then, three tables will be presented with data from each empirical study: the first one will display characteristics of the nurses and midwives (i.e. applicators/recipients of the strategy, professional level, length of professional practice or level of training), the second one will list the characteristics of the clinical reasoning support strategies (i.e. label, description, methods to apply, theories underpinning, and impact and outcomes reported) and, finally, the characteristics of the clinical context (i.e. setting and healthcare domain). The tabulated results will be accompanied by a narrative summary and the relationship between the results and the objectives of the review will be described.

2.8 Data storage plan

All data will be available at request immediately after the scientific results are published and will be stored for at least another five years on magnetic and optical storage devices (hard disks, CDs, DVDs).

3. Final Considerations

The completion of this scoping review offers a comprehensive mapping of the evidence on self-instructed bedside decision strategies used by nurses to support clinical reasoning. The ability to perform robust clinical reasoning is paramount in delivering high-quality healthcare and achieving favorable patient outcomes. By focusing on self-instructed, pragmatic, and contextually appropriate strategies, this review highlights the pivotal role nurses play in enhancing their clinical reasoning skills directly at the bedside. The findings of this review serve as a foundation for ongoing efforts to develop and implement effective decision-making strategies in nursing, ultimately contributing to the advancement of clinical practice and patient care.

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MANUSCRITO 7: Decision support strategies for bedside nursing clinical reasoning: a scoping review

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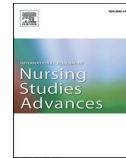
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Decision support strategies for bedside nursing clinical reasoning: A scoping review

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ABSTRACT

Background: Proficiency in clinical reasoning is crucial for achieving positive patient outcomes in healthcare. Nurses should take an active role in fostering their clinical reasoning skills. Bedside support strategies aim to offer practical, invaluable, and easily applicable resources for restructuring cognitive processes in situations of complex clinical demands.

Objective: This review aimed to map evidence on bedside decision strategies applied by nurses to support clinical reasoning.

Methods: The review followed the Joanna Briggs Institute recommendations for scoping reviews. **Information:** Sources Studies were retrieved from Medline (PubMed), CINAHL (EBSCOhost), Web of Science Core Collection, Scopus, Cochrane CENTRAL, RCAAAP (Repositórios Científicos de Acesso Aberto de Portugal), and Google Scholar. Studies published in Portuguese, English, Spanish, or Swedish, without imposing geographical or cultural restrictions were considered. Qualitative and quantitative studies on bedside decision strategies that support nursing clinical reasoning were included, while studies exclusively focused on education, case-specific content, or Artificial Intelligence applications were excluded.

Results: Out of 1889 results, 14 studies met the inclusion criteria. The studies were conducted in countries such as China, New Zealand, Norway, Brazil, Indonesia, Canada, Ireland, the United Kingdom, United States, and Australia, involving nurses, patients, and healthcare teams, with study designs ranging from qualitative research and cohort studies to quasi-experimental and theoretical analyses. These studies identified two key strategies: normative (following guidelines) and reflective (based on critical self-reflection).

Conclusions: Reflective strategies are widely used at the bedside, emphasizing the importance of adaptability in uncertain clinical environments. Despite Artificial Intelligence's role in clinical decision-making, fostering critical thinking and decision-making skills in nurses remains essential.

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Tweetable abstract: A scoping review identified normative and reflective bedside strategies used by nurses to support clinical reasoning, highlighting the value of adaptability and critical thinking in complex care settings. #ClinicalReasoning #Nursing #PatientCare.

1. Background

Clinical reasoning is the cognitive process that healthcare providers use to solve and manage clinical problems, reflecting sustained, and complex thinking. It is defined as "a complex cognitive process that uses formal and informal thinking strategies to gather and analyze patient information, evaluate the significance of this information, and weigh alternative actions" (Levett-Jones et al., 2010). Nurses, as frontline healthcare providers, must rapidly assess patient data, analyze information, and make informed decisions in high-pressure environments. This multifaceted process extends beyond simply following protocols; it requires critical thinking, situational awareness, and the ability to synthesize vast amounts of information efficiently under pressure (Corrao and Argano, 2022).

As healthcare becomes increasingly complex, the demand for proficient clinical reasoning skills among nurses intensifies (Holder, 2018). However, training and developing clinical reasoning skills remain challenging due to the complex and tacit nature of professional practice, as well as ongoing controversies on the most effective teaching methodologies. Inadequate training and insufficient reinforcement of clinical reasoning have been linked to increased clinical errors, which pose significant risks to patient safety and healthcare system efficiency (Gopal et al., 2021). Therefore, ensuring that nurses continuously enhance their clinical reasoning skills is critical for optimizing patient outcomes and maintaining high-quality care delivery (Poston et al., 2023).

To support clinical reasoning, bedside decision strategies play a crucial role in helping nurses navigate complex and evolving patient conditions. These strategies aim to structure cognitive processes, providing nurses with real-time guidance that fosters adaptive decision-making and enhances responsiveness to patient needs (Qian, 2024). However, despite their importance, the integration and systematic implementation of effective bedside decision strategies in nursing practice remain inconsistent. While emerging technologies such as artificial intelligence offer potential support mechanisms, the human element of critical thinking and adaptive judgment remains irreplaceable (Pinnock et al., 2020).

Despite the critical role of clinical reasoning, there is a notable gap in comprehensive understanding and implementation of effective bedside decision strategies among/with nurses. A more structured approach to identifying and applying these strategies is needed to ensure that nurses are well-equipped to handle diverse and unpredictable clinical scenarios. This scoping review aims to address this gap by mapping the existing evidence on bedside decision strategies that support nursing clinical reasoning. By identifying and categorizing these strategies, this review seeks to provide a clearer framework for empowering nurses with the tools necessary to make sound, timely, and effective clinical decisions.

2. Methods

This review followed the Joanna Briggs Institute (JBI) methodology for scoping reviews (Peters et al., 2020), enabling the gathering of data from both published and unpublished data by employing a comprehensive yet focused research question and a systematic search approach. A protocol was registered in Open Science Framework (<https://doi.org/10.17605/OSF.IO/H96VQ>), and published to provide guidance throughout the review process (Cunha et al., 2024).

2.1. Review question(s)

What is the evidence on self-instructed bedside decision strategies applied by nurses to support clinical reasoning? The main question was followed by three sub questions: What are the key concepts, theories, or definitions scaffolding decision strategies to support clinical reasoning in the provision of nursing care? What are the clinical contexts in which decision strategies to support clinical reasoning are being developed/applied? What are the assessed outcomes of decision strategies to support clinical reasoning in the provision of nursing care?

2.2. Inclusion criteria

To enhance clarity and systematically present the inclusion and exclusion criteria, the following table outlines the criteria used in this review (Table A.1).

2.3. Types of sources

Study designs such as experimental, quasi-experimental, analytical observational, descriptive, case reports, qualitative, opinion papers, editorials, and reflective or ethical studies were eligible. Additionally, abstracts were considered, and efforts were made to contact authors to access the full text. Unpublished material (e.g., reports and opinion papers), grey literature (e.g., theses and dissertations), and news articles were also considered. Systematic reviews were not directly included. However, if referenced in the selected data, we sought the original source to enhance our findings and discussion.

2.4. Search strategy

The review team developed a search strategy employing a three-stage process, which included controlled vocabulary and keywords to identify both published and unpublished literature. An initial limited search was performed in MEDLINE via PubMed, followed by an analysis of text words in the relevant titles and abstracts, and the index terms. The keywords and index terms were used to inform the development of the search strategies tailored for each included database. The search strategies underwent verification by a content expert reviewer utilizing the Peer Review of Electronic Search Strategies (PRESS) (Blackwood, 2015). The following electronic databases were searched from inception: MEDLINE (PubMed), CINAHL (EBSCOhost), Web of Science, Scopus, Cochrane CENTRAL, Cochrane Database of Systematic Reviews, and ProQuest Central (ProQuest). Gray literature and unpublished material were searched through Google Scholar, GreyNet, and RCAAP (Repositórios Científicos de Acesso Aberto de Portugal). Lastly, the reference lists of all the included studies were analyzed to identify additional studies. Studies published in Portuguese, English, Spanish or Swedish were included, without geographical or cultural limitations. No time restriction was applied. The full search was conducted on December 5th, 2023, and updated on January 4th, 2024. No results were added to this final search. The final search strategies for the included databases are presented in Appendix Eq. (A.1).

2.5. Source of evidence selection

The published and unpublished studies were imported to EndNote 20.5 (Clarivate Analytics, PA, USA), and duplicates were removed. The remaining duplicated references not identified by the software were manually excluded during the screening process. The references were imported into Rayyan (Qatar Computing Research Institute, Doha, Qatar) for screening. Study eligibility was determined through a two-stage selection process. Initially, the titles and abstracts were analyzed against the inclusion criteria, followed by an assessment of the full text for a final decision on inclusion. Each reference was checked by two independent reviewers (LC and MPS, members of the research team), both during the analysis of the title and abstract and during the analysis of the full text. Conflicts were solved through discussion among the reviewers.

2.6. Data extraction

Data extraction was conducted by two independent reviewers based on the language of the report. For this process, a data extraction tool was used, which had been developed and pilot-tested specifically for this review. The tool included details regarding study inclusion and exclusion criteria, nurse characteristics, clinical reasoning support strategy characteristics, healthcare context characteristics, and study characteristics relevant to the review question. The pilot test involved two independent reviewers extracting data from three different studies, followed by a consensus process and discussion to determine if any modifications to the original tool were necessary. No modifications were deemed necessary after the pilot test.

3. Results

Details pertaining to search results and source selection in this review are available in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram, depicted in Fig. A.1. From an initial search of 1889 records, and following all the eligibility process, 14 met the inclusion criteria. The reports excluded following the comprehensive review of the full text were those that contained solely educational content, employed Clinical Decision Support Systems and artificial intelligence, included populations that were not suitable for the study framework, or presented inappropriate outcomes. Additionally, reports were excluded if they lacked replicability due to the absence of a clinical reasoning support tool or if they were not pertinent to the domain of clinical reasoning.

3.1. Characteristics of included studies

All the 14 studies were published in English and were developed in United States of America ($n = 3$), United Kingdom ($n = 3$), New Zealand ($n = 2$), Australia ($n = 1$), Canada ($n = 1$), China ($n = 1$), Norway ($n = 1$), Brazil ($n = 1$), Indonesia ($n = 1$), between 1995 and 2022. Nine studies had a qualitative design. A complete list of the characteristics of included studies can be found in Appendix Eq. (B.1). A table in Appendix Eq. (C.1) presents the strategies, organized into three subsections: characteristics of the population, strategies for supporting clinical reasoning (concept), and characteristics of the clinical context, including the healthcare setting and domain.

3.2. Review findings

Self-Instructed Bedside Decision Strategies Used by Nurses to Enhance Clinical Reasoning

Researchers identified data patterns, and extracted key concepts related to decision strategies. Through the process of analysis and categorization, two primary strategies — normative and reflexive — emerged as overarching categories. Normative strategies involve adhering to formally defined structures and guidelines, such as Multicriteria Decision Analysis (Camilo et al., 2020), National Early Warning Score (NEWS®) (Fox and Elliott, 2015), National Emergency X Radiography Utilization Study (NEXUS®) (Pitt et al., 2006a), Restrain Decision Tree (Chen et al., 2022b), Team Concept Mapping (Aberdeen et al., 2010), and the Universal Form of Treatment

Options Decision Boxes (UFTO) (Fritz and Fuld, 2015). Reflexive strategies involve self- and hetero-constructed critical reflection, such as Case Reflection Discussion using Gibbs Cycle (Ardian et al., 2019), Integrative Nurse Coach (Bobbitt, 2021), Mentorship (Averlid and Høglund, 2020), Shared Decision Making (SDM) (Dontje et al., 2013), Shared patient-provider clinical decision support services with Personal Health Record (Davis et al., 2017a), Thinking Aloud Method (Corcoran-Perry et al., 1999), and a Toolkit -comprising 4A Model, Five Minute Preceptor, think aloud method, questioning and feedback (Cook, 2016). Table B.1 and B.2 outlines the features of normative and reflexive bedside strategies, including their mnemonic, attributes, advantages, and disadvantages, respectively.

3.3. Key concepts and theoretical frameworks for scaffolding decision strategies in clinical reasoning

A multitude of models/theories have emerged underpinning sampling studies, such as Piaget's Exploratory Learning (Piaget, 2020), Nightingale's Environmental Theory, (Zborowsky, 2014), The Transtheoretical Model of Health Behavior Change (Prochaska and DiClemente, 1983), Theory of Integrative Nurse Coaching (Dossey et al., 2014), Watson's Human Caring Theory (Sitzman and Watson, 2018), Benner's From Novice to Expert (Benner, 2021), Shared Decision Making Guidance Reminders in Practice (Holmes-Rovner et al., 2011), Theory of Patient and Consumer Activation (Hibbard and Mahoney, 2010), Information-processing Theory of Human Problem Solving (Simon, 1978), Model of Practical Skill Performance in Nursing (Bjork and Kirkevold, 2000), Cognitive Apprenticeship Theory (Collins et al., 1991), Kolb's Theory of Experiential Learning (Kolb et al., 2014), and The Unmet Needs Model (Cohen-Mansfield, 2008).

The key concepts underlying the discussed theories include clinical competence, nursing skills, patient-centered care, problem-solving and decision-making, environmental factors, behavioral change and patient engagement.

Clinical Contexts for the Development and Application of Decision Strategies in Clinical Reasoning

The studies have been conducted across various clinical settings, including medical surgical units (Ardian et al., 2019; Fox and Elliott, 2015), emergency care departments (Camilo et al., 2020; Pitt et al., 2006b), intensive care (Chen et al., 2022a; Corcoran-Perry et al., 1999), perioperative settings (Averlid and Høglund, 2020), family medicine and internal medicine practice (Dontje et al., 2013), nursing wards (Davis et al., 2017b; Fritz and Fuld, 2015), and high-care and low-care residential aged care facilities specializing in gerontology (Aberdeen et al., 2010). These diverse clinical settings reflect the broad scope of nursing practice and the need for tailored decision-making strategies across different patient populations and care contexts.

Assessed Outcomes of Decision Strategies in Supporting Clinical Reasoning for Nursing Care Provision

The Table C.1. summarizes the assessed outcomes of decision strategies supporting clinical reasoning in nursing care provision:

4. Discussion

The findings of this scoping review highlight the significance of normative and reflective decision-support strategies in nursing practice to enhance critical thinking, decision-making, and clinical reasoning accuracy, each offering unique contributions to nursing practice, informed by distinct theoretical frameworks and practical applications (Gustafsson et al., 2023).

Clinical reasoning is a practice-based form of reasoning essential for decision-making and problem-solving (Benner et al., 2008). It demands a strong foundation in scientific and technological knowledge, along with the ability to apply this knowledge to individual patients. Within a practice setting, clinical reasoning occurs in social contexts involving the patient, their family, the community, and healthcare providers (Benner et al., 2008). Given that clinical reasoning is situation-based, the importance of bedside strategies cannot be overstated. Such strategies offer practical resources for nurses to navigate complex clinical scenarios (Coyne et al., 2021).

The findings from recent studies underscore the critical role of cognitive support strategies in enhancing decision-making in healthcare settings (Stiegler and Gaba, 2015; Phillips-Wren et al., 2019). These strategies, which include checklists, algorithms, and structured reflection exercises, are essential for healthcare providers facing complex and high-pressure situations. By reorganizing cognitive processes and providing practical tools, these strategies help healthcare providers to effectively manage their cognitive load (Gustafsson et al., 2023). Guris and Lane-Fall (2022) further support this view, demonstrating that such cognitive aids not only help in prioritizing tasks but also in ensuring informed decision-making. The integration of these tools into routine practice allows healthcare providers to navigate demanding clinical scenarios with greater efficiency and accuracy. Consequently, the evidence strongly suggests that incorporating these cognitive support strategies into daily healthcare practices can significantly improve performance and patient care outcomes, even in the most stressful environments.

Self-Instructed Bedside Decision Strategies Used by Nurses to Enhance Clinical Reasoning

Normative approaches provide structured decision-making frameworks, that enhance clinical reasoning by providing standardized pathways for care delivery. Tools such as clinical care maps are widely recognized for improving patient outcomes and safety (McLachlan et al., 2019). While these approaches ensure consistency and reduce variability in care, they also raise concerns about potential over-reliance on structured guidelines, which may limit nurses' ability to apply independent critical reasoning in complex scenarios. The increasing integration of artificial intelligence into clinical practice further complicates this dynamic. Although AI-driven decision support systems can minimize errors and streamline clinical processes, they must not replace nurses' capacity for diagnostic reasoning, clinical judgment, and real-time decision-making (Sullivan et al., 2024; Benfatah et al., 2024). Reliable evidence-based guidelines enables transparency and systematic processes, helping to reduce bias, and ensure access to the latest evidence (Guerra-Farfan et al., 2023). However, reliance on such structured tools, like NEWS®, and NEXUS® criteria, although useful in streamlining care delivery and fostering confidence, may risk limiting creative or critical approaches to unique patient needs (Fox and Elliott, 2015; Pitt et al., 2006a). A key challenge remains in balancing technology-driven efficiency with the need for nurses to retain and refine their critical reasoning skills within structured decision-making environments.

While these normative strategies promote consistency and safety, they may fail in addressing rare or atypical situations, thus constraining the adaptability required in bedside care. Moreover, practical challenges such as outdated guidelines and fragmented access across various platforms hinder their application (Guerra-Farfan et al., 2023). There is also a need for improved design and integration of these aids, with thoughtful consideration of the existing guidelines ecosystem, and ensuring adequate training for their use (Greig et al., 2023).

Furthermore, care pathways offer a more localized approach to clinical reasoning, mapping the patient's journey, delineating roles and proposing one or more interventions based on a hierarchy of selection criteria (Flores et al., 2019). While tools such as team concept mapping or Restraint Decision Tree, aid nurses in navigating complex clinical situations by graphically structuring patient care activities (Aberdeen et al., 2010; Cheng et al., 2022), they may also contribute to the oversimplification of decision-making. Similarly, Decision boxes, like UFTO offer guidance to healthcare providers through diagnosis, treatment, and management steps (Fritz and Fuld, 2015), yet they risk promoting a checklist mentality that does not fully engage critical reasoning. Although these strategies enhance clarity in care delivery, they may risk oversimplifying decision-making when nuanced clinical judgment is required.

The application of Multicriteria Decision Analysis adds another layer of complexity, particularly in navigating conflicting criteria that must be addressed simultaneously (Camilo et al., 2020). While it offers a comprehensive approach to decision-making, its inherent complexity may limit its usability at the bedside, demanding a careful balance between the depth of analysis and the practical need for rapid decision-making (Mühlbacher and Kaczynski, 2016).

In summary, while normative strategies are essential for promoting consistency, patient safety and outcomes, they must be continually evaluated and adapted to ensure they are aligned with the specificities of the patient and context, rather than blindly following algorithmic recommendations. With the increasing digitalization of these services in healthcare systems, future efforts should aim at digitizing and integrating them into AI-driven platforms to support more predictive and responsive clinical decision-making (McLachlan et al., 2019). However, simply embedding normative strategies into digital tools is not sufficient—nurses must be trained to critically assess and adapt these tools to diverse patient contexts.

Reflective strategies are essential in nursing practice to enhance clinical reasoning, particularly at the patient's bedside, where nurses often face complex and uncertain clinical situations (Roca et al., 2020). By engaging in critical self-reflection nurses can identify, biases and assumptions that may otherwise influence their decision-making (Patel and Metersky, 2022). However, the effectiveness of these strategies depends on their integration into daily practice rather than being treated as abstract theoretical exercises.

The use of Case Reflection Discussion within frameworks like Gibbs Cycle provides a structured way to improve clinical reasoning (Amir et al., 2023; Hatem, 2023; Batterbee, 2024). Gibbs Cycle, which integrates reflection on feelings, evaluation, analysis, conclusion, and action plans, enhances critical thinking by prompting nurses to assess their clinical experiences systematically. Research has shown that implementing Case Reflection Discussion significantly improves engagement, cognitive maturity, and the ability to innovate in problem-solving, particularly among less experienced nurses (Ardian et al., 2019). Moreover, Case Reflection Discussion helps in dealing with the psychological impacts of adverse events in clinical settings, transforming negative experiences into learning opportunities that promote personal and professional growth (Li et al., 2020).

Integrative Nurse Coach adds another reflective dimension by merging traditional nursing skills with a holistic health approach, emphasizing personalized health programs that align with patients' beliefs and health goals. The Theory of Integrative Nurse Coaching underpins this practice, advocating for holistic healing and emphasizing nurse self-care to enhance client care (Knutson and Lincoln, 2014). By incorporating techniques such as motivational interviewing, goal setting, and mindfulness, Integrative Nurse Coach fosters deeper nurse-patient connections, thereby enabling nurses to create more personalized and effective care plans that address physical as well as emotional and spiritual aspects of health (Frey and Ratliff, 2018). While Integrative Nurse Coach has been shown to enhance nurse-patient relationships and improve care personalization, its effectiveness depends on nurses' ability to balance emotional intelligence with evidence-based reasoning. This holistic focus further enhances decision-making skills, as nurses engage in self-care and self-awareness preventing burnout while continuously improving their clinical reasoning through reflective practice (Moore et al., 2022).

Nurse-to-nurse mentorship programs, another key reflective strategy, provide a structured environment for developing clinical reasoning skills. Experienced nurses guide less experienced ones, enhancing clinical competence and professional satisfaction (Mijares and Radovich, 2020). By promoting emotional support, collaboration, and self-directed learning, mentorship enhances both mentor's and mentee's skills (Andersen and Watkins, 2018). However, challenges such as time constraints and variation in mentorship quality must be considered to maximize the effectiveness of these programs (Pop et al., 2022).

Integrating Shared Decision-Making into nursing practice further strengthens reflective practices by involving patients in the decision-making process. Nurses guide patients through evidence-based discussions that integrate patient preferences, allowing for more personalized care plans, (Patel and Metersky, 2022). However, while Shared Decision-Making improves patient satisfaction, and care adherence, it may introduce challenges, such as resource demands and potential conflicts between patient preferences and clinical recommendations (Müller et al., 2019). The strategy can be assisted by tools, like patient decision aids, which provide concise, fact-based information to help them grasp the options available and make informed choices (Milner and O'Connor, 2017).

Technological advancements such as mobile health (mHealth) apps and telehealth services, also offer new opportunities for reflective decision-making by providing real-time access to patient data and clinical reasoning tools to support decision-making, along with functions to Personal Health Record self-management (Seljelid et al., 2022; Davis et al., 2017b) (Davis et al., 2017a). However, telehealth encounters inherently carry higher risks and uncertainties compared to face-to-face interactions. The remote nature of telehealth can complicate the gathering of comprehensive patient information and limit physical examination, which are crucial for accurate diagnosis and treatment planning (Zhang et al., 2024).

Verbalization tools like Thinking Aloud Method further contribute to reflective strategies by providing real-time insights into nurses' cognitive processes during clinical reasoning (Laukvik et al., 2023). It allows for deeper understanding of the internal reasoning pathways often overlooked in traditional methods (Torre et al., 2020). By integrating this approach, nurses can optimize technology use to streamline assessments and interventions, applying their experience and heuristics more effectively within electronic health records systems (Laukvik et al., 2023). Building on the findings of Abdulmohdi and Mcvcar (2023), this verbalization technique can be effectively applied to improve clinical decision-making skills in nursing through the use of high-fidelity simulations. It supports the use of backward reasoning during debriefing sessions, allowing nurses to critically reflect on their decisions, and forward-thinking during patient deterioration simulations, helping them anticipate and respond to future clinical challenges. This suggests that Thinking Aloud Method plays a vital role in enhancing both reflective and anticipatory decision-making processes in nursing practice.

Incorporating Thinking Aloud Method within structured models such as the 4A Model, Five Minute Preceptor, and using questioning and feedback techniques further extends its utility in clinical settings. The synergy between verbalization techniques and these methods provides a comprehensive toolkit that supports multiple facets of learning and skill development (Cook, 2016). For instance, when applied to the 4A Model (focused on attention, accountability, action, and accessibility), think-aloud approaches help nurses better understand how they accept and integrate new experiences into their clinical practice (Medland and Kolar, 2021). Similarly, integrating verbalization into the 5MP framework provides real-time insights into cognitive process, which enables more targeted time-efficient feedback during clinical reasoning exercises (Bagioni et al., 2020). Structured questioning and feedback can, when paired with Thinking Aloud Method, can be tailored to individual learning needs, deepening understanding and promoting more effective skill acquisition (Güss, 2018). However, it is important to recognize the limitations in the boarder implementation of these strategies. Many nurses rely heavily on their tacit knowledge and often lack formal preparation in clinical teaching, which can result in ad hoc learning processes focused on technical proficiency without a deeper understanding of the underlying reasoning (Smith et al., 2024). To address this, a more intuitive and comprehensive approach, such as the toolkit combining verbalization strategies with established teaching frameworks, could be developed to support clinical facilitators in enhancing the reasoning skills of their learners (Cook, 2016).

By embracing a comprehensive approach that combines normative and reflexive decision support strategies, nurses are better equipped to handle the complexities of bedside patient care. This multifaceted approach enhances critical thinking, allowing healthcare providers to rely on both evidence-based guidelines and personal reflection, ensuring that patient care remains adaptable, responsive and aligned with the evolving demands of healthcare.

While each strategy brings distinct advantages, our findings suggest that no single approach serves as a universal gold standard; rather, reflective strategies—particularly Case Reflection Discussions and Thinking Aloud Method—appear to foster deeper cognitive engagement and adaptability, especially in complex or uncertain clinical scenarios. In contrast, normative tools like care pathways and AI-driven decision aids are more commonly used due to their operational efficiency and alignment with institutional protocols, though they may risk promoting a more prescriptive style of reasoning. Therefore, an integrated approach that balances the structure of normative strategies with the cognitive depth of reflective practices emerges as the most promising framework for enhancing clinical reasoning in nursing.

4.1. Key concepts and theoretical frameworks for scaffolding decision strategies in clinical reasoning

The application of theoretical frameworks in nursing practice provides a structured foundation for developing decision-making strategies that enhance clinical reasoning. Rather than merely cataloguing various theories, it is essential to critically examine how these models contribute to improve clinical reasoning.

Piaget's Exploratory Learning (2020) and Kolb's Theory of Experiential Learning (2014) emphasize the importance of hands-on, experiential processes in knowledge acquisition. While these frameworks emphasize active engagement, their effectiveness depends on the integration of structured reflection, such as prebriefing and debriefing, to ensure deeper learning. Without such reflective practices, experiential learning risks becoming a repetitive task rather than a tool for critical growth (Johnson, 2020). Moreover, the transition from intuitive to scientific reasoning, as described in these theories, underscores the necessity of targeted educational interventions, particularly for novice nurses who may struggle to navigate complex clinical environments effectively (Benner et al., 2008).

Similarly, Benner's From Novice to Expert Theory (2021) and Watson's Human Caring Theory (Sitzman and Watson, 2018) provide valuable perspectives on the evolution of nursing competence and the significance of humanistic connections in decision-making and reasoning. However, a critical consideration is whether a solely experience-based progression, as suggested by Benner, sufficiently prepares nurses for the unpredictable nature of clinical practice. While experiential learning is invaluable, structured mentorship and exposure to diverse clinical scenarios are equally crucial in accelerating the transition from novice to expert. Furthermore, Watson's emphasis on humanistic care raises questions about how emotional intelligence and ethical decision-making are integrated into standardized clinical reasoning frameworks (Wei and Watson, 2019). Simply fostering a healing environment is insufficient unless it is accompanied by deliberate strategies that embed patient-centered reasoning into everyday clinical decisions.

Nightingale's Environmental Theory continues to hold relevance in contemporary healthcare, particularly in its focus on how environmental factors influence patient outcomes. Nightingale's holist perspective that health involves nurturing both the physical and spiritual well-being aligns with the need for clinical reasoning that goes beyond mere scientific normative assessment. However, modern healthcare challenges—such as increased patient acuity and technological advancements—necessitate an expansion of Nightingale's principles beyond traditional environmental factors. While her perspective aligns with the need for comprehensive clinical reasoning, contemporary nursing practice requires a more dynamic approach that integrates evidence-based guidelines with

individualized patient needs (Nagata and Liehr, 2024).

Cognitive Apprenticeship Theory (Collins et al., 1991) and Information-processing Theory of Human Problem Solving (Simon, 1978) further contribute to understanding the cognitive processes underlying clinical decision-making. These theories emphasize how nurses develop clinical reasoning skills through structured learning experiences such as case studies, simulations, and decision-making frameworks. Normative strategies within these models guide nurses through clinical challenges, while reflective strategies, such as post-simulation debriefings, allow for critical self-evaluation and identification of learning gaps that can be addressed in future practice.

In the domain of patient education and chronic disease management, the Transtheoretical Model of Health Behavior Change (Prochaska and Velicer, 1997) and the Theory of Patient and Consumer Activation (Hibbard and Mahoney, 2010) highlight the gradual and individualized nature of behavior change. Normative strategies ensure systematic assessment and documentation of care needs, while reflective strategies focus on ongoing evaluation of the intervention effectiveness, ensuring that clinical reasoning adapts to patient responses (Cohen-Mansfield, 2008). However, their effectiveness in clinical reasoning depends on how well nurses integrate these models into everyday patient interactions. A significant limitation of these frameworks is that they primarily focus on patient engagement without explicitly addressing how nurses' own decision-making processes influence patient outcomes. Integrating both normative and reflective strategies within patient-centered care models, such as the Theory of Integrative Nurse Coaching (Dossey et al., 2014) and Shared Decision Making Guidance Reminders in Practice (Holmes-Rovner et al., 2011), allows for a more comprehensive approach to care. While these models promote patient-centered care, they must be critically assessed in terms of feasibility and consistency in practice. While normative strategies ensure the inclusion of standardized tools that account for patient preferences in care plans, reflective strategies encourage nurses to continually assess and refine their engagement and communication strategies to align with each patients' unique values and circumstances.

In summary, while the integration of theoretical frameworks provides a foundation for clinical reasoning, their application must go beyond theoretical alignment to ensure practical effectiveness. A critical challenge lies in balancing normative strategies that provide structure with reflective strategies that foster adaptability. Achieving this balance is essential for ensuring that nurses not only apply decision-making models but also critically assess and refine their reasoning processes in response to evolving clinical demands.

4.2. Clinical contexts for the development and application of decision strategies in clinical reasoning

From medical-surgical units to emergency departments, and from perioperative settings to residential aged care facilities, each care environment presents unique challenges that demand tailored reasoning approaches. For instance, the high-stakes, fast-paced nature of emergency care requires rapid and often high-risk decisions, contrasting with the more stable long-term management focus in gerontological care, where the emphasis is on quality of life (Aberdeen et al., 2010; Camilo et al., 2020). These varying demands underscore the importance of context-sensitive clinical reasoning, which adapts to the specific needs of each care setting.

To enhance the practical impact of these strategies, it is essential to assess their usability, accessibility, and relevance within specific clinical contexts. Regular evaluation of how decision-support tools are integrated into workflows, along with targeted training in reflective methods, can significantly improve their effectiveness. Embedding strategies into everyday practice—rather than treating them as isolated educational exercises—ensures they contribute meaningfully to the development of clinical reasoning. Ultimately, aligning these approaches with the realities of bedside care supports more responsive, context-sensitive decision-making.

As Clinical Decision Support Systems continue to evolve, there is a growing need for integrating data with domain knowledge in a way that allows for advanced reasoning and actionable insights (LeClair et al., 2022). An ontology-supported multi-context reasoning system can help this need by maintaining key system qualities while providing flexible, contextually aware decision support (LeClair et al., 2022). The presence of these tailored strategies across diverse settings reflects a broader understanding of how clinical reasoning must be nuanced and context-sensitive to improve patient outcomes and enhance the efficacy of nursing interventions.

Context in clinical reasoning is not a static collection of external circumstances, but rather a dynamic evolving process, of which individual's cognition is only one element (Konopasky et al., 2020). Situated cognition theory, which posits that thinking is intricately intertwined with the context in which it happens, emphasizes the complex interactions between the patient, healthcare provider, and clinical environment (Konopasky et al., 2020). This framework challenges conventional approaches that prioritize patient history and symptoms and symptoms in isolation. Instead, it draws attention to how contextual elements might influence clinical thinking, sometimes contributing to cognitive burden and diagnostic errors.

Assessed Outcomes of Decision Strategies in Supporting Clinical Reasoning for Nursing Care Provision

The outcomes of decision strategies designed to support clinical reasoning in nursing care reveal a multifaceted impact across several critical domains. Affective-cognitive outcomes, such as critical thinking, emotional self-regulation, and cognitive engagement, are crucial for effective patient-provider communication, interprofessional collaboration, and overall team effectiveness (Arnold and Boggs, 2019). Studies by Ardian et al. (2019) and Bobbitt (2021) underscores how these strategies promote cognitive maturation and innovative thinking, thereby improving the quality of reason.

Behavioral outcomes reflect the on practical benefits of these strategies, including more efficient decision-making in complex situations, improving medication management, and enhancing adherence to health behaviors. Research by Camilo et al. (2020) and Fox and Elliott (2015) shows that decision strategies assist nurses, particularly newly qualified and student nurses, in navigating the challenges of clinical decision-making and identifying patients in need of closer monitoring.

Health outcomes demonstrate significant improvements in patientcare, with significant reductions in restraint use, improved symptom management, and enhanced safety non-resuscitation patients, as seen in studies by Pitt et al. (2006a) and Fritz and Fuld (2015). These strategies not only streamline clinical reasoning processes but also promote a more person-centered care approach.

Furthermore, they support problem-based learning and address the limitations of short-term memory by providing structured frameworks for decision-making.

To further enhance clinical practice, the outcomes identified—cognitive, behavioral, and health-related—should serve as key indicators for evaluating the effectiveness of decision strategies in real-world settings. For example, improvements in critical thinking and emotional self-regulation can guide the development of targeted training programs, while behavioral indicators like decision-making efficiency and medication management can inform adjustments to workflow and support tools. Similarly, tracking health outcomes such as symptom control and patient safety can help healthcare providers and administrators determine which strategies yield the greatest impact on patient care. By systematically linking outcomes to strategy refinement, nursing practice can evolve to be more responsive, evidence-informed, and patient-centered.

Collectively, the evidence indicates that decision support strategies contribute to enhanced clinical reasoning by integrating cognitive, behavioral and health outcomes, thereby improving the overall quality of nursing care.

5. Limitations

This review offers a comprehensive framework for enhancing clinical reasoning in nursing by integrating both normative and reflective strategies, grounded in well-established theoretical models. While it provides valuable insights into the use of decision-making tools and reflective practices, its broad scope limits the depth of analysis for each approach, while encouraging further research to fully realize their impact on clinical practice.

6. Conclusions

Developing clinical reasoning skills among nurses requires a multifaceted approach that integrates normative and reflexive strategies within a broader theoretical and contextual framework. Normative approaches, anchored in evidence-based guidelines, offer a solid foundation, while reflexive strategies encourage critical reflection on personal biases and experiences, thereby creating a comprehensive reasoning process. Incorporating diverse strategies, such as Case Reflection Discussion using Graham Gibbs Cycle, Integrative Nurse Coach, Journaling, Mentorship, MCDA, NEWS®, NEXUS®, Shared Decision Making (with Personal Health Records), Restraint Decision Tree, Team Concept Mapping, Thinking Aloud Method, the toolkit for clinical educators, and the UFTO, enhances the quality of nursing care by fostering critical thinking, cognitive engagement, and patient-centered care. Each strategy's effectiveness, however, is contingent upon proper implementation, including adequate training, organizational support, and active engagement from both facilitators and recipients. Clinical reasoning in nursing requires tailored approaches that address the unique challenges of various care environments, from the high-stakes, fast-paced decisions to the long-term management focus. As Clinical Decision Support Systems evolves, integrating contextual data with domain knowledge is essential for advanced reasoning. Investigating the long-term impact of these strategies on patient outcomes and their integration with emerging technologies will be essential for advancing nursing practice, and to adapting to the evolving demands of healthcare.

What is already known

- Clinical reasoning is a complex cognitive process essential for nursing care, involving critical thinking and rapid decision-making in challenging clinical situations
- The ongoing challenge lies in developing and continuously improving clinical reasoning skills among nurses, as inadequate training can lead to increased clinical errors and compromised patient outcomes.

What this paper adds

- Two key bedside decision strategies are normative (guideline-based) and reflective (adaptive).
- Integrating these strategies improves clinical reasoning, especially in complex scenarios.
- Despite Artificial Intelligence support systems, bedside strategies remain vital for context-specific decisions.

CRediT authorship contribution statement

Lara Daniela Matos Cunha: Writing – review & editing, Writing – original draft, Validation, Supervision, Software, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Filipa Ventura:** Writing – review & editing, Software, Investigation, Formal analysis, Data curation, Conceptualization. **Márcia Pestana-Santos:** Writing – review & editing, Validation, Supervision, Software, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Mauro Mota:** Writing – review & editing, Methodology, Formal analysis. **Lurdes Lomba:** Writing – review & editing, Validation, Supervision, Methodology, Investigation, Formal analysis, Conceptualization. **Margarida Reis Santos:** Writing – review & editing, Visualization, Validation, Supervision, Project administration, Investigation, Formal analysis, Conceptualization.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing

interests: Lara Cunha reports financial support was provided by Foundation for Science and Technology. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Supplementary materials

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Appendix

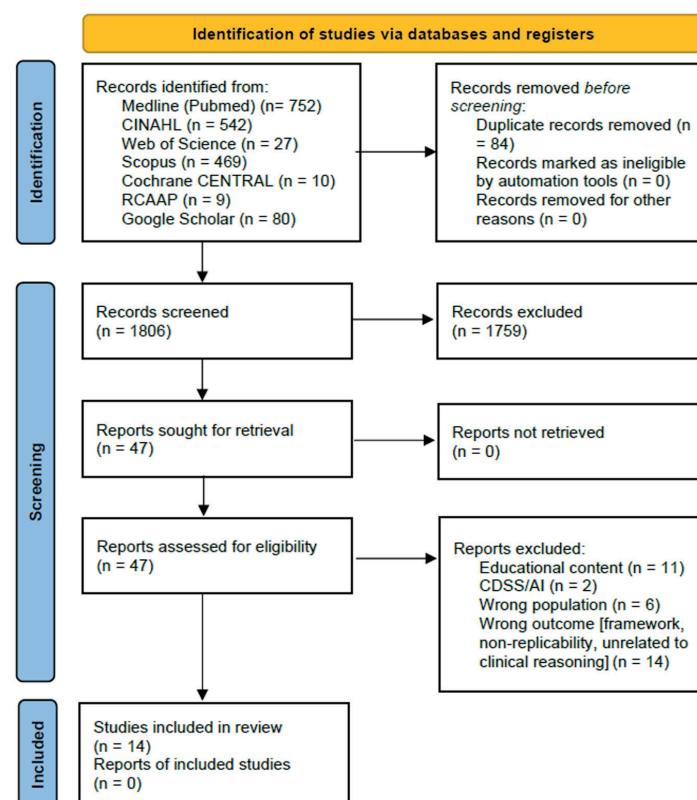


Fig. A.1. Search results and source selection and inclusion process (Page et al., 2021).

Table A.1
Inclusion and exclusion criteria.

	Inclusion Criteria	Exclusion Criteria
Participants	Studies involving nurses, either individually or as part of multidisciplinary teams, regardless of cultural/linguistic background, professional status, or academic qualifications.	Studies that do not involve nurses or focus solely on other healthcare professionals.
Concept	Studies examining clinical reasoning in nursing practice using decision support strategies (e.g., techniques, methods, approaches, instruments, interventions, tools, or resources). Studies addressing knowledge adequacy, data collection skills, reasoning strategies, and decision evaluation. Includes all phases of clinical reasoning (assessment, planning, implementation, evaluation). Simple and multi-criteria decision strategies included. Digital or online decision support strategies considered.	Studies focused on educational content, clinical studies of specific cases, or the development of software/artificial intelligence applications.
Context	No restrictions on healthcare settings or geographic locations. Applicable to all clinical scenarios.	None.

Table B.1
Features of normative bedside strategies for nursing clinical reasoning.

Features of Normative Bedside Strategies			
Mnemonic (Author, year)	Attributes	Advantages	Disadvantages
Multicriteria Decision Analysis (Camilo et al., 2020)	The problem may be defined as finding the best alternative for a decision-maker (DM) or finding a set of good alternatives. It involves problem structuring (i.e. selection of participants, alternatives and criteria); modelling (i.e. weighting, scoring and aggregation); and DM (i.e. interpretation of results and decision-making). Stages: 1) problem formulation, 2) identify the requirements, 3) set goals, 4) identify various alternatives, 5) develop criteria, and 6) identify and apply decision-making technique.	Structuring complex problems well and considering multiple criteria explicitly leads to more informed and better decisions. Support stakeholders through the process, align investments in health technologies with their preferences/needs and provide legitimacy to the DM process.	There is no longer a unique optimal solution to an MCDM problem that can be obtained without incorporating preference information. Need tools that help the DM focus on the preferred solutions (or alternatives). An alternative (solution) can be found by solving a mathematical model, requiring software to perform it.
National Early Warning Score [NEWS®] (Fox and Elliott, 2015)	NEWS® evaluates the extent of physiological deviation from the norm in response to sudden illness. They typically involve assigning scores to regularly measured physiological indicators in clinical practice. A score of zero indicates no physiological disruption, while higher scores indicate more significant disturbance. By assessing various physiological parameters simultaneously and combining their scores, these systems improve sensitivity and specificity in detecting early signs of acute deterioration.	A replicable clinically led system focused on early detection, rapid response, and responder competency, NEWS® employs easily measurable parameters at routine care points without specialized tests or equipment, resulting in notable reductions in sepsis and acute illness mortality rates by around 20 %, along with about 50 % decreases in hospital cardiac arrest rates, and reports of shortened hospital stays.	Initial professional resistance. Not all hospitals currently have enough staff with the necessary level of expertise to deliver the required response, particularly during overnight shifts or on weekends.
National Emergency X Radiography Utilization Study [NEXUS®] (Pitt et al., 2006a)	Unrecognized neck and spinal cord injuries in trauma cases prompt emergency physicians, particularly specialists, to prioritize neck radiology, despite most cases yielding normal results, leading to concerns over efficacy, misdiagnosis, and unnecessary financial burden, advocating for the development of decision-making aids based on related studies to streamline clinical decisions. NEXUS® comprised five criteria: the absence of cervical spine tenderness, no evidence of intoxication, full consciousness, no focal neurological lesions, and no distracting injuries; according to these guidelines, if all criteria are met, lateral neck radiographs are unnecessary in trauma patients.	Implementing NEXUS® could reduce costs and enhance communication among clinicians by providing a reliable, user-friendly method with a low false positive rate, particularly in settings lacking a unified health information management system.	In conscious, stable adults with cervical spine injury, Canadian C-Spine (CCR) criteria demonstrate clear superiority over NEXUS criteria in reducing unnecessary radiographic imaging.

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Table B.1 (continued)

Features of Normative Bedside Strategies			
Mnemonic (Author, year)	Attributes	Advantages	Disadvantages
Restrain Decision Tree (Chen et al., 2022b)	A map of the possible outcomes of a series of related choices. It allows an individual or organization to weigh possible actions against one another based on their costs, probabilities, or benefits. Decision trees can also be drawn with flowchart symbols, which are easier to read and understand.	Easy to understand, useful with or without extensive data (any required data needs minimal preparation), and new options can be added to existing decision trees. They are valuable for selecting the best option among several and can be easily combined with other decision-making tools. In complex decisions, often presents the relevant information much more clearly than a payoff table. Can also be used to help build automated predictive models, which have applications in machine learning, data mining, and statistics.	It does not try to identify all the events that might occur or all the decisions that need to be made about a subject under analysis. In the decision tree, only the decisions and events or outcomes that are important to the user and have consequences they want to compare are shown.
Team Concept Mapping (Aberdeen et al., 2010)	Values stakeholders' input and utilizes rigorous analytics to analyze opinions, beliefs, and values. It is a cognitive technique to organize and represent knowledge, to articulate issues, solve problems, and yield results supporting measurable progress. It is structured yet adaptable, organizing team ideas on any topic and visually representing them in interconnected maps, reflecting stakeholder perceptions and providing immediately usable results.	Promotes reacquisition adaptation, task mental models, and transactive memory systems, fostering team coordination processes essential for adaptation, and enhancing individual learning and performance within a team context—including retention and transfer—serves as a potent tool to improve the quality of both individual and team knowledge structures. It facilitates teamwork and performance by encouraging communication among team members, promoting effective task scanning, and fostering discussion and consideration of multiple perspectives and integrated expertise.	Only effective if it leads to high task mental model accuracy.
Universal Form of Treatment Options Decision Boxes [UFTO] (Fritz and Fuld, 2015)	A concise clinical summary that integrates the most reliable evidence, offering information on management options tailored to address clinical questions lacking a solution. Beyond summarization, it guides users in assessing the risks and benefits of all options, while also providing insights into the decision-making process. Ensuring brevity and lower information density is crucial for creating a positive initial impression of such tools and enhancing users' comprehension of the options.	Evidence-based shared decision-making support tool that synthesizes and simplifies information and serve as facilitator for communication with peers.	Understandability, format, missing information, and trust in the information (concerns about subjectivity and discrepancies with existing knowledge). The credibility of the information source (including expertise and trustworthiness) also influences the users' acceptability.

Table B.2

Features of reflexive bedside strategies for nursing clinical reasoning.

Features of Reflexive Bedside Strategies			
Mnemonic (Author, year)	Attributes	Advantages	Disadvantages
Case Reflection Discussion using Gibbs Cycle (Ardian et al., 2019)	a) describe the case in detail; b) feelings: discuss emotions and reactions; c) evaluate the situation, highlighting positives and negatives; d) analyze to understand why things happened as they did; e) conclude with lessons learned; f) action plan for future improvement. Structured reflection framework, emphasis on both emotions and rational analysis, iterative process for continuous improvement, encourages deep thinking and learning.	Comprehensive understanding: provides a thorough analysis of experiences. Emotional insight: helps in recognizing and understanding emotional responses. Continuous improvement: fosters a culture of learning and development. Clear framework: offers a clear, step-by-step guide for reflection.	Time-consuming: requires significant time and effort to complete each step thoroughly. Potential for superficiality: risk of shallow analysis if not done sincerely. Emotional discomfort: reflecting on negative experiences can be uncomfortable. Dependence on facilitation: may require skilled facilitation to be effective.
Integrative Nurse Coach (Bobbitt, 2021)	Integrative Nurse Coach take a holistic view of their clients' health, considering physical, emotional,	Integrative Nurse Coach develop individualized care plans based on patients' preferences, goals, and values,	Providing personalized care and building therapeutic relationships requires significant time and

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Table B.2 (continued)

Features of Reflexive Bedside Strategies			
Mnemonic (Author, year)	Attributes	Advantages	Disadvantages
	social, and spiritual aspects to develop comprehensive care plans. Work collaboratively with clients, empowering them to take an active role in their health management and decision-making process. Integrates evidence-based interventions from nursing, psychology, nutrition, and other disciplines to provide personalized care tailored to each patient's unique needs. Focus on promoting health and wellness rather than just managing illness, emphasizing preventive strategies and lifestyle modifications. Employ supportive communication techniques and demonstrate empathy to build trust and rapport with patients, fostering a therapeutic relationship.	leading to more tailored and effective interventions. The holistic approach of INCs addresses multiple dimensions of health, promoting overall well-being and enhancing quality of life. Focus on preventive care and health promotion strategies, reducing the risk of future health problems and improving long-term outcomes. Patients often report high levels of satisfaction due to the personalized, supportive, and empowering nature of the coaching relationship.	resources, limiting the number of clients Integrative Nurse Coach can effectively serve. Some patients may be resistant to adopting lifestyle changes or may prefer traditional medical interventions, posing challenges to the effectiveness of Integrative Nurse Coach.
Mentorship (Averlid and Högglund, 2020)	One-on-one relationship, long-term commitment, focus on personal and professional growth, mutual respect and trust. Goal setting: establish clear, achievable goals for the mentorship relationship. Regular meetings: schedule consistent, regular meetings to discuss progress and challenges. Feedback and support: provide constructive feedback and emotional support. Skill development: focus on developing specific skills and competencies.	Offers tailored advice and support to meet individual needs. Helps mentees develop skills, knowledge, and confidence in their field. Expands mentees' professional networks and career opportunities. Enhances job satisfaction and retention rates by providing support and development.	Requires significant time commitment from both mentor and mentee. Finding a suitable mentor-mentee match can be difficult. The effectiveness of mentorship can vary depending on the mentor's skills and dedication. Over-reliance on the mentor may hinder the mentee's independent decision-making.
Shared Decision Making (Dontje et al., 2013)	Collaborative approach, emphasis on patient involvement, respect for patient autonomy, evidence-based guidance, information exchange (provide patients with comprehensive information about their conditions and treatment options), deliberation (facilitate discussions to explore patient preferences, values, and concerns), collaboratively arrive at a decision that aligns with both clinical evidence and patient preferences, follow-up (ensure ongoing support and reassessment of decisions as needed).	Engages patients in their healthcare, promoting a sense of control and involvement. Improves satisfaction by aligning treatment with their values and preferences. Can lead to better health outcomes due to increased patient adherence and commitment to the chosen plan. Fosters trust and strengthens the patient-provider relationship.	Effective Shared Decision Making depends on clear and open communication, which can be challenging with language barriers or low health literacy. Differences in opinion between patients and providers can lead to conflicts. Healthcare providers may need training to develop skills in facilitating Shared Decision Making.
Shared patient-provider clinical decision support services with Personal Health Record (Davis et al., 2017a)	Digital integration of Personal Health Record with clinical decision support, patient and provider collaboration, emphasis on transparency and real-time information access, focus on personalized and evidence-based care.	Empowers patients by giving them access to their health information and involving them in decision-making. This leads to more personalized and effective care plans, potentially improving health outcomes. Streamlines information sharing, reducing redundancy and improving efficiency in clinical workflows. Increases transparency, building trust between patients and providers.	Raises concerns about the privacy and security of sensitive health information. May be challenging for patients with limited access to technology or low digital literacy. Requires significant investment in technology and training to implement effectively. Both patients and providers may resist adopting new digital tools and workflows.
Thinking Aloud Method (Corcoran-Perry et al., 1999)	Participants verbalize real-time their thoughts, reasoning, and decision-making processes while performing a task. Observers listen and take notes on the participant's thought processes and actions. Use the gathered information to provide feedback, identify issues, and suggest	Provides a detailed understanding of thought processes and decision-making. Helps uncover problems and misunderstandings that may not be apparent through other methods. Enhances training and learning by revealing how individuals approach tasks. Focuses on the user's perspective,	Participants may feel pressured or self-conscious about verbalizing their thoughts, potentially affecting performance. Thinking aloud may not reflect natural behavior, leading to less authentic results. Produces a large amount of qualitative data that can be time-consuming to analyze. May not

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Table B.2 (continued)

Features of Reflexive Bedside Strategies			
Mnemonic (Author, year)	Attributes	Advantages	Disadvantages
Toolkit comprising 4A Model, Five Minute Preceptor (5MP), think aloud method, questioning and feedback (Cook, 2016)	improvements. Iterative process to refine understanding and enhance task performance. This toolkit integrates multiple strategies to create an effective, comprehensive approach. By combining the 4A Model (Anchor, Add, Apply, Away), Five Minute Preceptor (get a commitment, probe for supporting evidence, teach general rules, reinforce what was done well, correct mistakes), Think Aloud Method (verbalizing one's thoughts aloud while performing a task or problem-solving activity), and Questioning (asking a series of questions to stimulate critical thinking, deepen understanding, and promote active engagement with the subject matter) and Feedback (information provided about their performance or understanding of a task, concept, or skill), facilitators can foster a rich learning environment that promotes critical thinking, engagement, and continuous improvement.	making it valuable for usability testing and design improvements. Combines different methods to provide a well-rounded experience. Promotes critical thinking and problem-solving skills through questioning and reflective practices. Engage participants actively, making the learning process more dynamic and interactive. Structured feedback loops encourage ongoing development and refinement of skills.	capture all aspects of complex cognitive processes, especially those that are automatic or subconscious. Implementing all components of the toolkit can be time intensive. May require significant resources, including time, training, and materials, to execute effectively. Methods that involve real-time verbalization and questioning can create pressure and anxiety. Effectiveness depends heavily on the skill and experience of the facilitators in using the various methods. Integrating multiple strategies requires careful planning and coordination to ensure they complement each other.

Table C.1

Assessed outcomes of decision strategies in supporting clinical reasoning for nursing care provision.

Study	Outcome	Key Findings	Domain
Ardian et al. (2019)	Enhancing critical thinking abilities	Cognitive maturation, engagement, and innovative thinking	Affective-Cognitive
Bobbitt (2021)	Promoting emotional self-regulation of cognition	Enhances emotional self-regulation in clinical decision-making	Affective-Cognitive
Kobert (1995)	Facilitating emotional enlightenment to discover meaning	Encourages reflective practices to uncover meaning and insights	Affective-Cognitive
Averlid and Högglund (2020)	Providing collaborative advantages bridging theoretical and practical domains	Fosters collaboration between theoretical and practical domains, enhancing learning	Affective-Cognitive
Camilo (2020)	Assisting in reaching compromise solutions with multiple criteria	Helps decision-makers find balanced solutions when multiple conflicting criteria are involved	Behavioral
Fox and Elliott (2015)	Aiding nurses in identifying patients needing closer monitoring	Serves as a valuable decision-making tool for newly qualified and student nurses	Behavioral
Pitt et al. (2006a)	Reducing time patients spend restrained	Utilization of clinical criteria reduces time patients are restrained	Behavioral
Dontje et al. (2013)	Increasing time for patients to absorb complex information	Allows patients to better absorb information and clarify concerns before decisions with providers	Behavioral
Chen et al. (2022b)	Achieving clarity in restraint decision-making	Improves decision-making clarity and practicality in restraint practices	Behavioral
Aberdeen et al. (2010)	Facilitating problem-based learning	Fosters person-centered care and a problem-solving approach in clinical settings	Behavioral
Corcoran-Perry et al. (1999)	Directing nurses' attention to available data	Improves cognitive focus and decision-making through structured approaches	Behavioral
Cook (2016)	Imparting frameworks for structured planning and performance	Benefits novice learners by providing clear, structured decision-making frameworks	Behavioral
Fritz and Fuld (2015)	Decreasing harm for non-resuscitation patients	Reduces unnecessary resuscitation measures for non-resuscitation patients	Health Outcomes
Davis et al. (2017b)	Patient activities include receiving decision support (alerts, reminders, personalized aids), accessing integrated health information, communicating with care teams and support groups, and recording health data (self-reports, monitoring).	The decision support services have a positive impact on patient-provider communication, patient knowledge, satisfaction, and ease of care (affective-cognitive outcomes); enhance patient decision-making, medication management, and adherence to health behaviors (behavioral outcomes); and improve physiological measures, quality of life, and symptom management (health outcomes).	Affective-Cognitive, Behavioral, Health Outcomes

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MANUSCRITO 8: Expert Consensus on Decision Support Strategies for Bedside Nursing Clinical Reasoning in Post-anesthesia Care: a modified eDelphi Study

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Advanced and Specialized Nursing Q1

Title: Expert Consensus on Bedside Decision Support Strategies for Nursing Clinical Reasoning in Post-Anesthesia Care: A Modified e-Delphi Study

Abstract

Background: Clinical reasoning is essential for providing safe and effective nursing care in high-acuity settings such as the Post-Anesthesia Care Unit (PACU). Although context-specific strategies are needed to support reasoning at the bedside, limited understanding exists regarding their suitability for the fast-paced PACU environment.

Purpose: To evaluate decision support strategies that enhance bedside clinical reasoning among PACU nurses, focusing on feasibility, applicability, and contextual relevance.

Design: A modified e-Delphi study.

Methods: The study was conducted in four phases: questionnaire development, pilot testing, iterative expert consensus rounds, and data analysis. Fourteen strategies were evaluated: Journaling, Thinking Aloud, Mentoring, Shared Decision-Making, Gibbs' Reflective Cycle, NEWS®, Integrative Nurse Coach, Multi-Criteria Decision Analysis, NEXUS®, Toolkit (4A, 5MP, TAM, Feedback), Restraint Decision Tree, Team Concept Mapping, Shared Decision-Making with Personal Health Records, and the Universal Form of Treatment Options (UFTO). Data were collected via Google Forms and analyzed using SPSS and content analysis. Consensus was defined as $\geq 75\%$ agreement.

Results: Of 30 invited experts, 20 completed Round 1 and 14 completed Round 2 (67% response rate; 30% dropout). Ten strategies reached consensus in Round 1, with strong support for reflective, collaborative, and evidence-based approaches such as mentoring, shared decision-making, and team concept mapping. Four strategies were refined and re-evaluated in Round 2. Simulation training and structured briefing/debriefing were also noted as beneficial. Barriers included digital literacy, ethical concerns, and contextual fit.

Conclusion: Adaptable, ethically sound, and interdisciplinary strategies are needed to support clinical reasoning in PACU nursing, informing future education, practice, and policy.

Keywords - Clinical Reasoning, Post-anesthesia Nursing, Postoperative Care, Uncertainty.

Background

Clinical reasoning is a critical competency in nursing practice (Simmons, 2010), especially in high-acuity environments such as Post-anesthesia Care Units (PACUs),

where rapid and accurate decision-making is essential to ensuring patient safety and optimal recovery (Mert, 2023). In these settings, nurses must continually assess dynamic physiological changes, anticipate complications, and act promptly on clinical cues (Van Wicklin, 2020). This requires more than foundational knowledge – it demands well-developed clinical reasoning, adaptability, and the ability to make contextually sound decisions (Van Wicklin, 2020). Given the complexity and rapid pace of care, there is a growing need for bedside structured decision support strategies to enhance nurses' ability to process information, reflect in action, and collaborate effectively within multidisciplinary teams (McNeill et al., 2023).

However, bedside clinical reasoning is often influenced by varying levels of experience, workload, and organizational culture (Garibaldi & Russell, 2021). While some nurses rely on intuition or peer input, others may benefit from structured guidance to support their thought processes (Liu et al., 2025). Unsupported or inconsistent reasoning can lead to delays in recognizing patient deterioration or implementing appropriate interventions, underscoring the need for strategies that effectively support clinical decision-making at the bedside (Dresser et al., 2023).

A wide range of strategies have been developed or adapted to support nurses in refining clinical reasoning, enabling them to make more informed and consistent decisions. Some strategies are structured and evidence-driven, such as the National Early Warning Score (NEWS®) (Fox & Elliott, 2015), which standardizes physiological assessments to detect early signs of deterioration, and the National Emergency X-Radiography Utilization Study (NEXUS®) criteria (Pitt et al., 2006), which streamline decisions related to imaging in trauma care. Tools like Multicriteria Decision Analysis (MCDA) (Camilo, 2020) and Restrain Decision Tree (Chen et al., 2022) offer nurses logical frameworks to evaluate clinical alternatives and predict likely outcomes. Similarly, strategies like Team Concept Mapping (Aberdeen et al., 2010) and Universal Form of Treatment Options (UFTO) Decision Boxes (Fritz & Fuld, 2015) facilitate collaborative reasoning by organizing clinical options in user-friendly, evidence-based formats that can be used directly at the bedside.

In addition to these normative approaches, more reflexive strategies have gained attention for their role in enhancing critical thinking and reflective practice. Techniques such as Case Reflection using Gibbs' Cycle (Ardian et al., 2019) encourage nurses to analyze past experiences, fostering deeper learning and improvement in future clinical encounters. The Integrative Nurse Coach approach (Bobbitt, 2021) emphasizes holistic, person-centered care planning, while formal Mentorship fosters individualized confidence and competence development by guiding nurses through structured decision-making processes (Averlid & Høglund, 2020). Journaling serves as a powerful

tool for self-reflection, allowing the 'writer' to explore and weave together the fragmented experiences of life, ultimately uncovering deeper connections and insights within their own existence (Kobert, 1995). Shared Decision Making (SDM) (Dontje et al., 2013) fosters patient participation and alignment with personal values, and Shared Patient-Provider Clinical Decision-support Services (Shared Decision Making with Personal Health Record: SDM-PHR) offer real-time, transparent access to data that can inform more complete choices (Davis et al., 2017). Meanwhile, cognitive approaches like the Thinking Aloud Method (Corcoran-Perry et al., 1999) and educational toolkits (e.g., the 4A Model and Five-Minute Preceptor) (Cook, 2016) promote situational awareness, feedback, and real-time reflection during clinical tasks.

Although these strategies show promise in supporting nursing clinical reasoning, their implementation at the bedside in the post-anesthesia care remains inconsistent, often lacking a structured, unified approach. Moreover, there is a notable absence of studies that specifically support or evaluate their use within this particular setting, limiting evidence-based guidance for their integration into PACU. Time constraints, training requirements, and varying levels of technological readiness present barriers to widespread adoption (Garibaldi & Russell, 2021; Weaver et al., 2005). Furthermore, the diversity of available strategies raises questions about which are most suitable, feasible, and impactful for the unique demands of PACU.

To address this challenge, the aim of this study was to evaluate decision support strategies that can enhance bedside clinical reasoning among PACU nurses, focusing on feasibility, applicability, and contextual relevance. By identifying strategies that meaningfully enhance nursing clinical reasoning, this effort seeks to ensure they are both conceptually grounded and practically suited to the dynamic, high-pressure environment of post-anesthesia care, where timely and well-structured decision-making is essential at the bedside.

Methods

Study design

A modified e-Delphi study was conducted. The study followed four structured phases: development of the e-Delphi questionnaire, pilot testing for clarity and relevance, implementation of multiple iterative e-Delphi rounds for expert consensus, and comprehensive data analysis to refine and validate decision support strategies for enhancing clinical reasoning in the PACU setting.

The reporting of this study adhered to the Delphi studies in social and health sciences – recommendations for an interdisciplinary standardized reporting (DELPHISTAR) (Niederberger et al., 2024).

Panelists

A total of 30 experts were selected nationwide to form the panel. The selection of participants for the expert panel was carried out through purposive sampling. Experts were recruited through professional institutions, including coordinators of master's and postgraduate programs in perioperative nursing, professors and researchers in the perioperative field, and specialist nurses. Specialist nurses were chosen for their advanced clinical expertise and hands-on experience in perioperative care (Dahlberg et al., 2021). The selection was based on their direct involvement in patient care, decision-making, and implementation of best practices in surgical settings. These professionals possess in-depth knowledge of perioperative protocols, patient safety measures, and technical and non-technical skills essential for high-quality surgical care. Many of them also have postgraduate education or specialized training, reinforcing their ability to provide expert insights. Their role in mentoring, training, and contributing to the development of perioperative nursing further establishes their status as experts in the field. To ensure a robust sample, collaboration was sought from key national nursing organizations, including the Portuguese Association of Operating Room Nurses (AESOP), the Azores Surgical Nursing Association (AECA), the Association of Specialist Nurses in Medical-Surgical Nursing (AEEEMC), and the Portuguese Nurse Board.

Development of the e-Delphi Questionnaire

A questionnaire was developed based on the 14 strategies identified in a previous scoping review (Cunha et al., 2024). The first section began with a sociodemographic characterization, collecting data on age, gender, professional category, academic degree, scientific-pedagogical area/specialization, years of professional experience in the perioperative field, and perioperative clinical context.

In the second section, each strategy was briefly named and described, including its operationalization method and roll-out method (Supplementary File 1). Some strategies included demonstrative examples or a detailed operationalization scheme. The open-ended questions were designed to evaluate the feasibility, applicability and consensus of each strategy (Bucyibaruta et al., 2023; Niederberger & Spranger, 2020). Panelists were invited to evaluate three specific dimensions: a) the perceived importance of each strategy, b) its practical feasibility within the clinical context, and c) their overall agreement with the strategy as subject matter experts. Each strategy was rated using a five-point qualitative scale: "Strongly Disagree," "Disagree," "Neither Agree nor Disagree," "Agree," and "Strongly Agree." Participants were then asked to respond to an open-ended question: "Comment on or suggest modifications to Strategy X to ensure its

suitability for the post-anesthesia clinical context.” This approach was designed so to allow for the incorporation of both quantitative and qualitative data to inform the evaluation process.

In the final section, titled "The Expert's Opinion: Additional Strategies," panelists were asked to suggest any additional strategies that had not been presented, and to explain why they considered them important for supporting clinical reasoning in the post-anesthesia context.

Pilot Testing

A pre-test was conducted with five specialist nurses who met the inclusion criteria. Only semantic adjustments were made based on their feedback, and the data from this pre-test were not included in the final sample.

Data Collection

Data collection was carried out remotely using Google Forms. Potential panelists were emailed access links, inviting them to participate in the modified e-Delphi study and informing them about the study's purpose. All the experts who completed the first round were invited to participate in the second round. The asynchronous, iterative online rounds continued until one of the following conditions was met: consensus was achieved—defined as 75% agreement at the median threshold; at least 75% of responses fell within the top two categories of the Likert scale, indicating stabilized response variation (Niederberger et al., 2021).

Data Analysis

Quantitative data were analyzed using IBM SPSS version 29.0 (SPSS, Inc., Chicago, IL), while qualitative responses were analyzed through content analysis to identify key themes and insights (Drisko & Maschi, 2016). After each round, feedback to panelists included statistical summaries of group responses, synthesized qualitative feedback, item revisions, and the refinement of strategy descriptions for the following round. The feedback was aggregated across all expert panel. Items showing very high consensus were accepted and excluded from subsequent rounds, while those with low agreement (dissent) but not outright rejected were adjusted based on the suggestions and advanced to the next round for further consideration (Jünger et al., 2017).

Ethical Considerations

Ethical considerations focused on ensuring the quality, confidentiality, and integrity of data collected through the online platform, as well as safeguarding participants' rights.

Participation was entirely voluntary, with no financial or material incentives provided. Informed consent was obtained electronically prior to involvement, with participants receiving comprehensive information about the study's objectives, methodology, expected outcomes, researcher contact details, and potential risks and benefits, promoting transparency throughout the process (Newman et al., 2021). To ensure privacy and data security, each participant was assigned a unique identification code and given password-protected access to the platform, allowing progress to be monitored securely. A detailed privacy statement was also shared, outlining how data would be used, participants' rights, and the measures implemented to maintain anonymity and confidentiality (Gupta, 2017). All personal data were stored only for the duration strictly necessary for research purposes and were not shared with third parties or cross-referenced with other datasets, in full compliance with data protection standards.

Ethical approval was granted by Health Science Research Unit: Nursing (UICISA:E) Ethics Committee under reference number 1009/02-2024.

4. RESULTS

Of the 30 experts invited to participate in the study, 20 participated in the first round, and 14 completed Round 2, resulting in an initial response rate of 67% and a dropout rate of 30% between rounds. Panelists are experienced perioperative professionals, mostly female, with diverse roles, including nurse specialists, nursing professors, and researchers. Most held master's or doctoral degrees and a specialization in perioperative, medical-surgical, or critical care. Their clinical practice spanned operating rooms, post-anesthesia care units, and ambulatory surgery. Table 1 provides detailed information on demographics.

Table 1 – Demographics of the modified e-Delphi panel

	Round 1 (n=20)	Round 2 (n=14)
<i>Age</i>		
mean (SD)	43 (7.6)	45 (8.6)
<i>Perioperative experience</i>		
mean (SD)	14 (6.9)	14 (7)
<i>Gender</i>		
n (%)		
male	8 (40)	9 (64)
female	12 (60)	5 (36)
<i>Professional Category</i>		
n (%)		
Nurse specialist	14 (70)	11 (79)
Adjunct Professor	3 (15)	2 (14)
Coordinator Professor	2 (10)	1 (7)
Researcher	1 (5)	0
<i>Academic Degree</i>		
n (%)		
Bachelor	1 (5)	2 (14)
Master	14 (70)	10 (72)

Doctoral	5 (25)	2 (14)
<i>Scientific-Pedagogical Area/Specialization</i>		
<i>n (%)</i>		
Medical Surgical	8 (40)	11 (79)
Perioperative	10 (50)	2 (14)
Critical care	2 (10)	1 (7)
<i>Perioperative Clinical Setting</i>		
<i>n (%)</i>		
PACU*	3 (15)	3 (21)
OR & PACU	9 (45)	5 (36)
OR**	4 (20)	4 (29)
SA***	2(10)	1 (7)
Other	2(10)	1 (7)

*Post-anesthesia Care Unit

**Operating Room,

***Ambulatory Surgery

Round 1

Panelists evaluated 14 decision-making support strategies for feasibility, applicability and relevance in post-anesthesia care settings. Out of the 14 strategies, 10 reached consensus in the first round and were accepted.

Strategy 2 "Thinking Aloud Method" received strong support, though its real-time application was considered limited due to patient sensitivity and clinical workflow constraints. Concerns were raised about its feasibility in real patient care, especially with patients recovering from anesthesia, as it could be confusing or distressing for them. Additionally, the patient profile was emphasized, as not all patients react positively to overhearing reasoning processes. The method was similar to practices used in integrating new colleagues or working with students. As a result, the method was accepted, but its use should be carefully managed to align with the specific care context.

Strategy 3 – "Mentoring" was viewed as a form of supervision that is applicable within the working context, particularly during the integration process and later as a role for a reference nurse. It was emphasized that clear criteria must be established for identifying potential mentors to ensure effective implementation. Mentoring was consensually accepted as a valuable strategy for professional development and team cohesion.

Strategy 4 – "Shared Decision-Making (SDM)" was considered ideal for complex decision-making scenarios and was seen as a highly humanized and impactful approach. It was also pointed out that for SDM to function correctly, the patient must not be experiencing altered states of consciousness, as this is often the case in the immediate postoperative phase. Experts recommended caution in applying the strategy during periods of temporary consciousness changes.

Strategy 5 – "Gibbs' Reflective Cycle for Case Discussion" received strong consensus, particularly for its usefulness in reflecting on decision-making processes and identifying areas for improvement. Experts considered it a valuable method for post-

event reflection to identify weaknesses and implement necessary changes. However, it was noted that a significant shift in the healthcare paradigm is needed to overcome the existing tendency to conceal errors within certain institutions. The strategy was also praised for foster participation, discussion, and team growth, especially when real problems are discussed or through problem-based learning approaches. While some experts preferred the Nicklin supervision cycle (Nicklin, 2000) in their practice, others found this method suitable for discussing less frequent situations and as a strategy for learning and reflecting on practice in team meetings. It was recognized as highly beneficial for team competency optimization, but its day-to-day application was seen as difficult. Experts particularly valued it for addressing urgent situations in the post-anesthesia context. Although considered one of the most significant strategies, its use was recommended only for complex cases where a more thorough analysis could be productive.

Strategy 6 – "NEWS®" was recognized as a useful tool for documenting a patient's clinical state at a given moment but not for anticipatory decision-making in preventing complications. The scale was originally developed to assess critically ill patients, and its applicability in the early post-operative recovery phase—when patients are still under the influence of medications and anesthetic gases—was questioned, as any alterations might not be related to the patient's physiological state but to side effects from the drugs administered. While some experts acknowledged its potential utility for identifying patients with deteriorating conditions and facilitating appropriate monitoring, others pointed out that there are other scales with greater applicability and familiarity. Additionally, there were suggestions for improvement, such as automatically validating the scale through new monitoring systems and presenting risk results directly to professionals. Despite its potential, some experts felt that it did not offer significant advantages given the advancements in digital records and the competencies of perioperative nurses. Furthermore, it was critiqued for being a reductive and biomedical approach.

Strategy 7 – "Integrative Nurse Coach" was met with both support and reservations. Some panelists acknowledged its potential, while others raised concerns about its applicability in settings where nurse-patient interactions are brief, and the patient's main concern is addressing the immediate clinical issue rather than focusing on lifestyle changes or disease prevention. Experts also highlighted that there isn't a single overarching theory for human care, though Watson's Transpersonal Caring Theory (Watson, 2011) could be applicable in certain contexts. Overall, the strategy was accepted, though with caution regarding its integration into the perioperative environment.

Strategy 10 – "Model 4A, 5MP, TAM, Feedback" was generally regarded positively, with experts acknowledging that it reflects a widely used approach, even if not always recognized as a systematic method. Panelists found the strategies appropriate for the context, particularly in teaching and learning environments. However, concerns were raised about its feasibility in everyday practice, especially given staffing limitations and the unique characteristics of PACU settings. Despite these limitations, the method was considered the most comprehensive and suitable for adoption in the context of training, receiving strong support overall.

Strategy 12 – "Team-Based Concept Mapping" was viewed as highly useful, particularly for fostering the analysis of concepts. It was generally accepted with positive feedback regarding its ability to enhance team collaboration and conceptual understanding.

Strategy 13 – "SDM-PHR" (Shared Decision-Making with Personal Health Records) was seen as applicable, especially if developed pre-operatively involving all stakeholders in the surgical care process. This would allow the post-operative team to use these shared decisions as a basis for planning patient care. While it was considered a meaningful tool, there were significant challenges to its implementation, including usability issues, understanding of medical information, and technological barriers such as interoperability between Electronic Health Records (EHRs). Concerns about privacy and security were also raised, as sharing sensitive data could expose vulnerabilities to cyber-attacks. Despite these challenges, the strategy was accepted, with reservations regarding its practical application.

Strategy 14 – "UFTO" (Universal Form of Treatment Options) was accepted, but experts highlighted several considerations. They emphasized the importance of addressing ethical issues and professional deontology, particularly regarding the right to conscientious objection, which should be clearly integrated into the decision-making process. It was noted that existing tools, like RENTEV (Vital, 2021), already cover advanced directives. While the idea of creating treatment option tables in advance for inclusion in the patient's clinical process was seen as feasible, its implementation in the perioperative context of scheduled surgeries was considered challenging. Despite these concerns, the strategy was accepted.

However, four strategies did not reach consensus in Round 1, and four new strategy descriptions were introduced based on experts' feedback and comments:

- Strategy 1 – "Reflective Diary" While some panelists highlighted the importance of using reflective analysis to evaluate daily performance and improve decision-making, they stressed that any competence acquisition process should be rooted in reflection, specifically reflecting for, on, and about actions. However, the feasibility of implementing

a reflective diary in a PACU was questioned, as the fast-paced environment with numerous surgical patients each shift could hinder its practical application. Furthermore, panelists suggested that rather than maintaining a formal diary, allocating dedicated time for reflection or revisiting key moments throughout the shift might be more effective. There was also the suggestion that pre-defining reflective content or introducing structured reflective time could allow nurses to integrate the practice into their daily planning. Based on the panelists' suggestions, the strategy was revised: the name was redefined to better reflect its practical application, and the content was pre-defined to guide the reflective process more effectively, facilitating its integration into daily nursing routines.

- Strategy 8 – "Multicriteria Decision Analysis" While considered valid for settings with low standardization, limited multidisciplinary collaboration, or urgent clinical situations, panelists expressed concerns about its operational complexity and the time required for decision-making. Some suggested the need for simplification to enhance its feasibility in the PACU context. No significant changes were suggested to the strategy, and its description was simplified to enhance clarity.

- Strategy 9 – "NEXUS®" Several experts emphasized that this strategy is more appropriate for emergency trauma settings rather than for the PACU, where patients have already undergone surgical interventions to address acute trauma. Concerns were raised about the applicability of standardized criteria like NEXUS® in such contexts, as decisions—such as whether to perform a cervical spine X-ray—are highly case-specific and may exceed the autonomous scope of perioperative nurses. Some also suggested that other clinical tools, such as the Canadian C-Spine Rule (Stiell et al., 2001), might offer greater specificity. Overall, panelists questioned whether this decision-making tool aligns with the responsibilities and competencies of perioperative nurses. No significant changes were suggested to the strategy, and its description was simplified to enhance clarity.

- Strategy 11 – "Restraint Decision Tree" While some panelists acknowledged that a decision tree could be a useful tool in the PACU context, concerns were raised regarding the frequent use of chemical restraints, particularly in patients experiencing confusion or altered states of consciousness. The complexity and ethical considerations surrounding restraint use, especially in PACU, contributed to differing opinions on the practicality and appropriateness of this strategy. No significant changes were suggested to the strategy, and its description was simplified to enhance clarity.

Round 2

The following strategies did not achieve 75% consensus during the first round, indicating the need for additional discussion and adjustments to better fit the realities of clinical practice. However, after refinement based on expert feedback, all four strategies reached consensus and were accepted in the second round. Strategy 1 – “Reflective Journal”: Qualitative feedback emphasized the need for clinical supervision, time constraints in practice, and the potential value of structured reflection tools. Strategy 8 – “Multi-Criteria Decision Analysis”: Accepted with high agreement on relevance and applicability. Some panelists noted potential implementation complexity but acknowledged its alignment with existing personal methodologies. Strategy 9 – “NEXUS® Criteria”: Despite some concerns about scope and interprofessional boundaries, consensus was reached. Comments highlighted limited experience in trauma patients and potential interprofessional tensions. Strategy 11 – “Restriction Decision Tree”: Achieved strong consensus, with positive feedback about its applicability, especially if adapted from existing prehospital guidelines to intra-hospital perioperative settings.

Table 2 presents the strategies assessment, highlighting their relevance, applicability, and consensus results from the modified e-Delphi method across two rounds.

Table 2 - Summary of Strategy Evaluation and Consensus Outcomes percentage

Strategy	Round 1 Consensus (%)	Round 2 Consensus (%)	Outcome	Notes / Modifications
1. Reflective Analysis Journal	No (65)	Yes (100)	Accepted	Renamed and structured with guiding questions
2. Thinking Aloud Method	Yes (80)	-	Accepted	Useful in simulation; caution with real-time use around patients
3. Mentoring	Yes (95)	-	Accepted	Consider using term “Preceptorship”; role clarity needed
4. Shared Decision-Making (SDM)	Yes (90)	-	Accepted	Apply in pre-op; ensure patient cognitive readiness
5. Case Discussion – Gibbs’ Reflective Cycle	Yes (95)	-	Accepted	Best for post-event reflection and team learning
6. NEWS®	Yes (75)	-	Accepted	Alerts for clinical deterioration; concerns about specificity post-op

7. Integrative Nurse Coach	Yes (95)	-	Accepted	Humanistic model; some question applicability in short interactions
8. Multi-Criteria Decision Analysis	No (60)	Yes (79)	Accepted	Clarification provided; complex but useful
9. NEXUS®	No (40)	Yes (75)	Accepted	Better suited for trauma settings; limited perioperative relevance
10. 4A, 5MP, TAM, Feedback Questionnaire	Yes (80)	-	Accepted	Comprehensive educational tool; fits structured settings
11. Restraint Decision Tree	No (65)	Yes (86)	Accepted	Ethical concerns flagged; accepted with contextual caution
12. Team Concept Mapping	Yes (75)	-	Accepted	Encourages shared learning and reflection
13. SDM-PHR	Yes (85)	-	Accepted	Valuable if integrated pre-op; tech and privacy barriers noted
14. UFTO	Yes (75)	-	Accepted	Aligns with autonomy; concern about feasibility in planned surgery

Additionally, the open-ended question "The Voice of the Expert" suggests several formative strategies to enhance clinical skills and team effectiveness, including using simulation scenarios to support clinical reasoning. These scenarios allow nurses to face realistic situations and practice their skills in a controlled environment, improving their ability to respond effectively in real-life contexts. Briefing and debriefing during shift handovers are also recommended to assess the care provided, identify areas for improvement, and promote effective communication and collaboration within the team.

Discussion

This study provides valuable insights into the expert-endorsed strategies that can feasibly and effectively support clinical reasoning at the bedside in the dynamic environment of PACU. Drawing from expert consensus over two rounds, the process provided valuable insights into the feasibility, relevance, and adaptability of each strategy in a high-demand clinical environment.

First, strategies such as Mentoring (Averlid & Høglund, 2020), Team-Based Concept Mapping (Aberdeen et al., 2010), and Gibbs' Reflective Cycle (Ardian et al., 2019) can be incorporated into professional development programs and team meetings to enhance continuous learning and team cohesion (Kramer, 2024). They promote deeper levels of reflection within experiential learning, as described by Kember et al. (2008), guiding learners from basic descriptive understanding toward more critical forms of reflection,

where they examine and potentially revise their assumptions and beliefs in response to conceptual challenges. While reflection has traditionally been seen as an individual cognitive process, there is increasing recognition of the value of social contexts in enhancing reflective practice. Høyrup and Elkjær (2006) introduced the idea of "collaborative reflection," emphasizing the benefits of shared reflection within groups. Collaborative environments foster the development of metacognitive and reflective skills (Sadlik et al., 2017). For example, peer-to-peer sharing of reflective writing fosters engagement with diverse viewpoints (Leaders et al., 2024), while well-organized collaborative learning—guided by defined roles and shared goals—enhances social interaction and facilitates knowledge sharing and collaborative knowledge construction in PACU (Trefethen et al., 2023; Wong et al., 2023). Also, formal mentorship programs can strengthen fellowship initiatives by fostering confidence and competence in novice nurses, making them viable candidates for direct integration into the PACU clinical setting (Scully et al., 2024).

Second, SDM (Dontje et al., 2013) and SDM-PHR (Davis et al., 2017) underscore the importance of patient-centered approaches (Nilsson, 2019). While their application in the immediate postoperative phase may be limited due to patient consciousness or capacity, these strategies remain relevant during pre-operative planning and recovery follow-up (Leung, 2022). Machine learning algorithms show promise in utilizing extensive patient health records to predict optimal PACU discharge times, demonstrating consistent predictive performance (Maroufi et al., 2025). Further research is needed to translate these findings into practical improvements in patient outcomes and hospital efficiency. Nonetheless, PACU nurses recognize the importance of involving patients in their own care and believe that barriers such as impaired consciousness, time constraints, or fragmented care should not justify excluding patients from decision-making. Integrating SDM approaches during pre-operative planning and post-discharge follow-up can help build trust, ensure transparency, and align care with patients' values (Miller et al., 2021; Tanada, 2023).

Digital health records, which incorporate both structured and unstructured patient data along with coding systems, clinical decision support tools, e-prescribing, and e-referral functionalities, offer significant potential to enhance care quality (Hants et al., 2023). According to the World Health Organization (WHO, 2019), these systems can improve care delivery through protocol-based prompts and alerts, efficient data storage and synthesis, and thorough documentation of clinical activities. However, concerns remain regarding nurses' clinical reasoning not being adequately supported by these systems, potentially compromising patient safety (Bail et al., 2020). Additionally, the effectiveness of digital health tools depends on nurses' digital literacy and educational readiness

(Hants et al., 2023). Nurses have also reported challenges when system-generated recommendations conflict with their own clinical judgment, leading to interactional dilemmas in practice.

Third, tools like NEWS® (Fox & Elliott, 2015) and UFTO (Fritz & Fuld, 2015) offer structured support for clinical assessment and care planning. While not without limitations, their selective use—alongside clinical judgment—can help standardize monitoring and treatment goals, particularly when adapted to the specific needs of PACU patients. Yang et al. (2024) demonstrates that the NEWS® is an effective tool for early detection of postoperative illness severity changes in hospitalized elderly patients, facilitating timely interventions and reducing the risks of deterioration. In the PACU, respiratory complications are common, and using NEWS-2 to monitor rising oxygen requirements can help detect deteriorating conditions and prompt timely interventions to improve patient outcomes (Gonem et al., 2024). Also, NEWS® can be used to assess nursing activity load, as it correlates with the intensity of nursing care required for patients with acute conditions, thus offering a valuable tool for optimizing the distribution of nursing human resources (Turcato et al., 2024). Using the UFTO in the PACU highlights the importance of clear communication and meticulous documentation to ensure that treatment decisions are in line with patient preferences, ultimately improving patient outcomes and reducing unnecessary interventions during recovery (Fritz, 2024).

Fourth, strategies like Simulation-Based Training and structured Briefing/Debriefing (highlighted through expert feedback) can be implemented to foster team preparedness, improve communication, and support reflective practice, especially in complex or high-risk scenarios. In the PACU setting, in-situ simulation proves invaluable, as it delivers realistic, contextually relevant training within the actual clinical environment, enabling healthcare professionals to refine their skills, boost patient safety, and reinforce collaborative care (Villemure et al., 2019). Patel et al. (2022) further support this, showing that in-situ simulation significantly enhances PACU nurses' preparedness for emergency situations. Additionally, incorporating context-sensitive debriefing—whether following critical incidents or as a routine practice—can further advance team communication, support experiential learning, and contribute to safer patient care in the PACU (Paxino et al., 2024).

Finally, the study reinforces the need to critically evaluate the contextual relevance and feasibility of each strategy before implementation. For example, the revised Reflective Diary (Kobert, 1995)—adapted to include pre-defined prompts and structured time—demonstrates how strategies can be modified to suit fast-paced environments. Roche et al. (2023) suggests that both gratitude journaling and cognitive strategies are contextually relevant, feasible, and well-accepted interventions that may support the

mental well-being of healthcare workers. From the patient's perspective, journaling can also be utilized as a therapeutic tool to externalize pain, enhance emotional expression, and foster self-awareness—offering a holistic and humanizing approach to managing the complex experience of chronic pain (Putnam, 2023). However, strategies such as NEXUS® (Pitt et al., 2006) or the Restraint Decision Tree (Chen et al., 2022) highlight the importance of role clarity, ethical considerations, and alignment with nursing scope of practice. NEXUS reinforces the value of systematic assessment protocols that align with the nurses' scope of practice, reduce the risk of over-intervention, and ensure that care is both effective and appropriate (Pitt et al., 2006). When adapted to nursing practice, especially in high-stakes environments like the PACU, such frameworks support safe, consistent, and legally sound clinical reasoning. Via-Clavero et al. (2024) underscores the pressing need to move beyond isolated educational efforts and adopt context-sensitive, multicomponent strategies to meaningfully reduce or eliminate the use of physical restraints in adult critical care units. While the translation of evidence-based recommendations into routine clinical practice remains limited, the analysis suggests that interventions combining staff training with elements such as cognitive and physical stimulation, decision-support tools, involvement of multidisciplinary teams, and a broader institutional commitment to cultural change may offer the most promise (Via-Clavero et al., 2024). Any implementation efforts should be preceded by a thorough assessment of the specific local context to tailor interventions to the unique cultural, organizational, and patient care realities of each setting, thereby maximizing their relevance and impact.

Potential limitations of this study include the limited number of participating experts, which may influence the breadth of perspectives captured. Strengths of the study include the use of a structured and iterative modified e-Delphi approach, which enabled expert consensus across diverse perioperative roles. The integration of both quantitative and qualitative analyses enhanced the depth and rigor of findings. Additionally, the study addressed a significant gap in the literature by evaluating the feasibility, relevance, and contextual suitability of clinical reasoning strategies specifically within the PACU setting, offering practical insights for nursing education, policy, and practice.

Overall, this study offers a framework for nursing post-anesthesia care to selectively implement, adapt, and evaluate clinical reasoning strategies that are both evidence-informed and tailored to the specific realities of PACU. It also highlights the need for enhanced nurse training, with greater investment in digital literacy to improve the effectiveness of digital health tools in supporting clinical decision-making at the bedside.

Conclusion

This study enabled an expert consensus on decision support strategies to enhance bedside nursing clinical reasoning in post-anesthesia care. Ten strategies reached consensus in the first round, showing strong support for reflective, collaborative, and evidence-based approaches such as mentoring, team-based concept mapping, shared decision-making, and structured case discussions. Some tools like NEWS® and UFTO were accepted with contextual and ethical reservations. Four strategies—Reflective Diary, Multicriteria Decision Analysis, NEXUS®, and Restraint Decision Tree—were revised and re-evaluated in a second round, resulting in greater alignment. Simulation training and structured briefing/debriefing were especially valued for enhancing teamwork and reasoning. Overall, the study emphasizes the need for adaptable, ethically sound, and interdisciplinary decision support strategies to strengthen clinical reasoning in post-anesthesia care. The findings can inform future educational interventions such as educational material, clinical guidelines, and policy development aimed at strengthening nursing clinical reasoning in PACU.

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Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

Bem-vindo(a) ao eQuestionário para Peritos em Enfermagem Perioperatória

Estimado(a) Enfermeiro(a)

Gostaríamos de convidá-lo(a) a participar na investigação como perito em enfermagem perioperatória. Este estudo é realizado com o recurso ao consenso dos peritos com base nos seguintes critérios de inclusão: **ser enfermeiro(a) especialista em enfermagem médico-cirúrgica e/ou mestrado em enfermagem perioperatória, ter pelo menos 3 anos de prática clínica perioperatória como enfermeiro especialista**. Em alternativa, ser **investigador e/ou ter desenvolvido investigação na área científica da enfermagem perioperatória**.

O objetivo deste e-Delphi é alcançar um **consenso sobre as estratégias de apoio ao raciocínio clínico de enfermagem no contexto pós-anestésico aplicáveis de forma pragmática à beira do leito**. Pretendemos **identificar e avaliar as estratégias que melhor se adequam a este cenário clínico específico**.

Estas estratégias foram selecionadas através de um mapeamento prévio (ver [Scoping Review Protocol](#)) e incluem técnicas, métodos, instrumentos, intervenções, ferramentas e recursos utilizados na prática de enfermagem. Os estudos incluídos foram avaliados de acordo com: adequação do conhecimento, capacidade de colher dados clínicos relevantes, uso de estratégias de raciocínio apropriadas, habilidade para refletir e (re)avaliar a tomada de decisão à beira do leito.

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1/44

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Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

Agradecemos a sua valiosa contribuição.

* [Indica uma pergunta obrigatória](#)

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2/44

23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidade de Cuidados Pós-Anestésicos: consenso de peritos

Consentimento Informado, Esclarecido e Livre para Participação em e-Delphi Modificado

Estimado(a) Enfermeiro(a), Professor(a), Investigador(a)

Está convidado a participar no estudo de investigação sobre estratégias de apoio ao raciocínio clínico dos enfermeiros nas Unidade de Cuidados Pós-Anestésicos. Este estudo está a ser conduzido por Lara Cunha (PhD), Márcia Pestana-Santos (PhD), Lurdes Lomba (PhD), Margarida Reis Santos (PhD). Os objetivos deste estudo de investigação são: desenvolver um guia com estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidade de Cuidados Pós-Anestésicos através de consenso de peritos.

A capacidade de articular conhecimentos, atitudes ou habilidades para resolver problemas em situações concretas de trabalho, devem ser contextualizadas aos valores e cultura locais. Por essa razão, o(a) senhor(a) enfermeiro(a) é convidado(a) a participar na investigação como perito em enfermagem perioperatória. Os critérios de inclusão como perito são: ser enfermeiro especialista em enfermagem médico-cirúrgica e/ou mestrado em enfermagem perioperatória, ter pelo menos 3 anos de prática clínica perioperatória como especialista. Em alternativa, ser investigador e/ou ter desenvolvido investigação na área científica da enfermagem perioperatória.

O Painel Delphi consistirá no máximo de três rondas de questionários, os quais serão enviados eletronicamente. A sua participação envolverá a avaliação das estratégias propostas, fornecendo *feedback* e sugestões de melhoria. Estimamos que cada ronda de questionários exija aproximadamente 15 a 20 minutos do seu tempo. Posteriormente, os resultados da investigação serão apresentados sob forma de guia de apoio à prática clínica.

O estudo obteve parecer favorável pela Comissão de Ética da Unidade de Investigação em Ciências da Saúde: Enfermagem (UICISA:E) da Escola Superior de Enfermagem de Coimbra.

A participação na investigação é de caráter voluntário, não existem prejuízos de abandono em qualquer momento. São garantidos a confidencialidade e uso exclusivo dos dados recolhidos para o presente estudo e o anonimato. Deste estudo não advirá nenhuma despesa ou risco.

Ao completar este questionário e a totalidade das rondas, declara que recebeu a informação necessária, ficou esclarecido e aceita participar voluntariamente neste estudo.

NOTA: Se tiver alguma dúvida acerca de algum aspeto relacionado com a sua participação na investigação, ou quiser requerer certificado de participação, poderá contactar o investigador principal (enflaracunha@esenfc.pt).

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3/44

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Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

1. Aceita participar no estudo como perito? *

Marcar apenas uma oval.

☐ Sim

☐ Não

Caraterização Sociodemográfica

2. Idade (anos)

3. Género

Marcar apenas uma oval.

☐ Feminino

☐ Masculino

☐ Não binário

☐ Prefiro não declarar

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4/44

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Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

4. Categoria Profissional

Marcar apenas uma oval.

- ☐ Enfermeiro Especialista
☐ Enfermeiro Gestor
☐ Professor Adjunto
☐ Professor Coordenador
☐ Investigador

5. Grau Académico (assinale o mais elevado)

Marcar apenas uma oval.

- ☐ Licenciatura
☐ Mestrado
☐ Doutoramento

5/44

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Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

6. Área Científico-pedagógica/Especialização

Marcar apenas uma oval.

- ☐ Enfermagem Médico-cirúrgica
- ☐ Enfermagem Médico-cirúrgica - ramo pessoa em situação crítica
- ☐ Enfermagem Médico-cirúrgica - ramo pessoa em situação perioperatória
- ☐ Enfermagem Médico-cirúrgica - ramo pessoa em situação crónica
- ☐ Enfermagem Médico-cirúrgica - ramo pessoa em situação paliativa

7. Tempo de Experiência Profissional na Área do Perioperatório (anos)

8. Experiência Profissional em Contexto Clínico Perioperatório

Marcar apenas uma oval.

- ☐ Bloco Operatório
- ☐ Unidade de Cuidados Pós-anestésicos
- ☐ Unidade de Cirurgia de Ambulatório
- ☐ Bloco Operatório e Unidade de Cuidados Pós-anestésicos
- ☐ Outra

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6/44

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Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

Painel de Peritos

Nesta secção, serão descritas sumariamente 14 estratégias de apoio ao raciocínio clínico em enfermagem. Algumas destas estratégias serão apresentadas com o auxílio de imagens/esquemas, que podem não estar traduzidas para o português. O objetivo é compreender a **relevância**, **aplicabilidade** e **grau de concordância** de cada estratégia para a sua potencial utilização pelos enfermeiros que trabalham nas Unidades de Cuidados Pós-anestésicos na sua prática clínica. Sabemos, pelo mapeamento prévio, que as estratégias são funcionais para outros contextos da prática de enfermagem. Através da sua análise e *feedback*, pretende-se perceber a sua **adequação ao contexto clínico pós-anestésico**.

Para cada estratégia apresentada, pedimos-lhe que avalie:

- a) o quão importante é cada estratégia (i.e., **Relevância**);
- b) o quão aplicável seria (i.e., **Aplicabilidade**);
- c) o seu **grau de concordância** com a estratégia enquanto perito.

A avaliação de cada estratégia é feita com recurso a escala tipo *Likert* em que:

- 1 corresponde a "não sei"
- 2 corresponde a "discordo totalmente"
- 3 corresponde a "discordo"
- 4 corresponde a "não concordo nem discordo"
- 5 corresponde a "concordo"
- 6 corresponde a "concordo totalmente":

Estratégia 1. Diário Reflexivo [Journaling]

O **Diário Reflexivo** é uma produção escrita das experiências clínicas dos enfermeiros através das suas próprias palavras. É uma ferramenta útil para desenvolver o pensamento crítico, a reflexão e as competências de descrição, análise crítica, síntese e de autoavaliação.

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7/44

23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

Exemplo de Diário Reflexivo (estruturado)

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8/44

23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

DATE : 21/24

S M T W T H F S

check-in

MY RANKING OF THE DAY :

☆☆☆☆☆

I FEEL :

😊 😊 😊 😊 😊 😊 😊 😊 😊 😊

3 THINGS I LEARNED TODAY :

○ the 4 stages of labor

○ the 1st stage has 3 phases

○ pitocin- stimulates contractions

MOST REWARDING INTERACTION I HAD :

My patient shared stories of growing up in her home country while I got her IV started. Afterwards, she told me that I did a great job.

I AM PROUD OF :

I inserted my first IV today! Woo hoo! I was so nervous but I was successful and saw the flash of blood return. The patient was able to get the medications she needed.

SOMETHING I AM LOOKING FORWARD TO :

I am looking forward to mother-baby unit. I can't wait to take care of new moms and welcome little ones into this world. I'm excited to be apart of someone's life- changing moment and see the look of wonder in their eyes.

I AM THANKFUL FOR :

I am thankful for my preceptor who was patient with me while I was trying to get the IV started. She watched quietly as I thought my way through all the steps.

9/44

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Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

9. Em relação à Estratégia 1 "Diário Reflexivo", como avalia:

Marcar apenas uma oval por linha.

	Não sei	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo	Concordo totalmente
Relevância	☐	☐	☐	☐	☐	☐
Aplicabilidade	☐	☐	☐	☐	☐	☐
Concordância	☐	☐	☐	☐	☐	☐

10. Comente ou sugira alterações à Estratégia 1 "Diário Reflexivo" para a sua adequação ao contexto clínico pós-anestésico.

23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

Estratégia 2. Método de Pensar em Voz Alta [Thinking Aloud Method - TAM]

Os participantes verbalizam em tempo real os pensamentos, raciocínio e o processo de tomada de decisão durante a execução de uma tarefa. Os observadores ouvem e tomam notas sobre os processos de pensamento e as ações dos participantes. Utilizam a informação recolhida para dar *feedback*, identificar problemas e sugerir soluções.

11. Em relação à Estratégia 2 "Método de Pensar em Voz Alta", como avalia:

Marcar apenas uma oval por linha.

	Não sei	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo totalmente
Relevância	☐	☐	☐	☐	☐
Aplicabilidade	☐	☐	☐	☐	☐
Concordância	☐	☐	☐	☐	☐

23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

12. Comente ou sugira alterações à Estratégia 2 "**Método de Pensar em Voz Alta**" para a sua adequação ao contexto clínico pós-anestésico.

Estratégia 3. **Mentoria**

A **Mentoria** é uma aliança profissional em que os indivíduos trabalham em conjunto ao longo do tempo para apoiar o seu crescimento pessoal e profissional. O mentor é um profissional sénior ou mais experiente que é designado para funcionar como conselheiro, orientador ou guia para um profissional menos experiente. É responsável por oferecer ajuda e *feedback* ao profissional sob a sua supervisão.

13. Em relação à Estratégia 3 "Mentoria", como avalia:

Marcar apenas uma oval por linha.

	Não sei	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo	Concordo totalmente
Relevância	☐	☐	☐	☐	☐	☐
Aplicabilidade	☐	☐	☐	☐	☐	☐
Concordância	☐	☐	☐	☐	☐	☐

14. Comente ou sugira alterações à Estratégia 3 "Mentoria" para a sua adequação ao contexto clínico pós-anestésico.

Estratégia 4. Tomada de Decisão Partilhada [Shared Decision Making - SDM]

A **Tomada de Decisão Partilhada** basea-se no processo de comunicação através do qual os doentes e os profissionais de saúde trabalham em conjunto para tomar decisões óptimas em matéria de cuidados de saúde que estejam de acordo com o que é mais importante para os doentes. A SDM requer três componentes: evidências clínicas claras e imparciais sobre as opções razoáveis e os riscos, benefícios e encargos de cada alternativa (incluindo a ausência de intervenção), experiência do profissional de saúde na comunicação e adaptação dessa evidência a cada doente.

15. Em relação à Estratégia 4 "**Tomada de Decisão Partilhada**", como avalia:

Marcar apenas uma oval por linha.

	Não sei	Discordo totalmente	Discordo	Não concordo nem	Concordo totalmente
Relevância	☐	☐	☐	☐	☐
Aplicabilidade	☐	☐	☐	☐	☐
Concordância	☐	☐	☐	☐	☐

23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

16. Comente ou sugira alterações à Estratégia 4 "Tomada de Decisão Partilhada" para a sua adequação ao contexto clínico pós-anestésico.

Estratégia 5. Discussão de Caso utilizando o Ciclo Reflexivo de Gibbs

Esta estratégia combina a **discussão de caso clínico** com a estrutura do **Ciclo Reflexivo de Gibbs**. Fases: a) descrever o caso clínico em pormenor; b) sentimentos: discutir as emoções e as reações; c) avaliar a situação, destacando os aspectos positivos e negativos; d) analisar para compreender por que razão as coisas aconteceram como aconteceram; e) concluir com as lições aprendidas; f) plano de ação para melhorias futuras.

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Ciclo Reflexivo de Gibbs

Gibbs' Reflective Cycle

Gibbs' Reflective Cycle



6 | SlideSalad.com

slidesalad

17. Em relação à Estratégia 5 "Discussão de Caso utilizando o Ciclo Reflexivo de Gibbs", como avalia:

Marcar apenas uma oval por linha.

	Não sei	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo	Concordo totalmente
Relevância	☐	☐	☐	☐	☐	☐
Aplicabilidade	☐	☐	☐	☐	☐	☐
Concordância	☐	☐	☐	☐	☐	☐

18. Comente ou sugira alterações à Estratégia 5 "Discussão de Caso utilizando o Ciclo Reflexivo de Gibbs" para a sua adequação ao contexto clínico pós-anestésico.

23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

Estratégia 6. **National Early Warning Score [NEWS®]**

Sistema de pontuação simples em que é atribuído um score à monitorização de sinais vitais por rotina e respetivo registo no processo clínico do doente. Os seis parâmetros fisiológicos simples constituem a base do sistema de pontuação:

- Frequência respiratória
- Saturação de oxigénio
- Temperatura
- Pressão arterial sistólica
- Frequência cardíaca
- Nível de consciência.

É atribuída uma pontuação a cada um destes sinais vitais à medida que são mensurados e agregados, e a magnitude da pontuação reflete o grau de variação extrema do parâmetro em relação à norma.

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18/44

23/04/25, 15:43 Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

National Early Warning Score [NEWS®] standardização da avaliação da gravidade da doença aguda

Physiological Parameters	3	2	1	0	1	2	3
Respiration Rate (BPM)	≤8		9-11	12-20		21-24	≥25
Oxygen Saturations (%)	≤91	92-93	94-95	≥96			
Any Supplemental Oxygen		Yes		No			
Temperature (°C)	≤35		35.1-36.0	36.1-38.0	38.1-39.0	≥39.1	
Systolic Blood Pressure (mmHg)	≤90	91-100	101-110	111-219			≥220
Heart Rate (BPM)	≤40		41-50	51-90	91-110	111-130	≥131
Level of Consciousness				A			V, P or U

Escala de Risco Clínico

NEWS Scores	Clinical Risk
0	Low
Aggregate 1 - 4	
RED Score* (Individual parameter scoring 3) Aggregate 5 - 6	Medium
Aggregate 7 or more	High

19. Em relação à Estratégia 6 "NEWS®", como avalia:

Marcar apenas uma oval por linha.

	Não sei	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo	Concordo totalmente
Relevância	☐	☐	☐	☐	☐	☐
Aplicabilidade	☐	☐	☐	☐	☐	☐
Concordância	☐	☐	☐	☐	☐	☐

20. Comente ou sugira alterações à Estratégia 6 "NEWS®" para a sua adequação ao contexto clínico pós-anestésico.

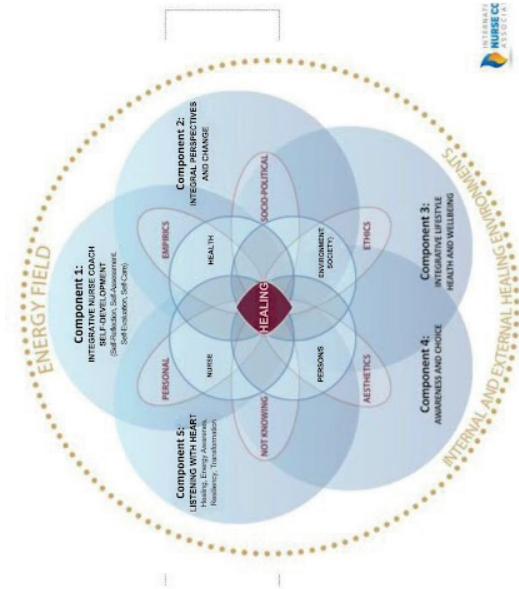
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Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

Estratégia 7. Enfermeiro Coach Integrativo [INC]

O **Enfermeiro Coach Integrativo** adota uma visão compreensiva da saúde, considerando os aspetos físicos, emocionais, sociais e espirituais para desenvolver um plano de cuidado integral. Trabalham em colaboração com a pessoa e família, capacitando-os para assumirem um papel ativo na gestão da saúde e no processo de tomada de decisão. Esta abordagem concentra-se na promoção da saúde e do bem-estar, em vez de se limitar a gerir a doença, dando ênfase às estratégias preventivas e às modificações do estilo de vida.

Theory of Integrative Nurse Coaching (TINC)



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21. Em relação à Estratégia 7 "Enfermeiro Coach Integrativo", como avalia:

Marcar apenas uma oval por linha.

	Não sei	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo	Concordo totalmente
Relevância	☐	☐	☐	☐	☐	☐
Aplicabilidade	☐	☐	☐	☐	☐	☐
Concordância	☐	☐	☐	☐	☐	☐

22. Comente ou sugira alterações à Estratégia 7 "Enfermeiro Coach Integrativo" para a sua adequação ao contexto clínico pós-anestésico.

Estratégia 8. Análise de Decisão Multicritério [Multi-Criteria Decision Analysis - MCDA]

Análise da melhor alternativa de decisão, ou de conjunto de boas alternativas ordenadas por critérios explícitos, os quais possuem, cada um, uma importância relativa distinta, sendo, portanto, atribuídos pesos diferentes. Envolve a estruturação do problema (seleção de participantes, alternativas e critérios), a modelação (ponderação, pontuação e agregação), a interpretação dos resultados e a tomada de decisão. Fases: 1) formulação do problema, 2) identificar os requisitos, 3) definir objetivos, 4) identificar várias alternativas, 5) desenvolver critérios, e 6) identificar e aplicar a técnica de tomada de decisão.

Exemplo de esquema de Análise de Decisão Multicritério: nesta análise consideram-se a solução atualmente utilizada, a alternativa 1 e a alternativa 2. Após a interpretação de critérios (aqui omissos), é feita uma avaliação comparativa das alternativas com base na classificação/ordenação (de 5 a 1). No final da avaliação, é selecionada a alternativa 1.



23. Em relação à Estratégia 8 "Análise de Decisão Multicritério", como avalia:

Marcar apenas uma oval por linha.

	Não sei	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo totalmente
Relevância	☐	☐	☐	☐	☐
Aplicabilidade	☐	☐	☐	☐	☐
Concordância	☐	☐	☐	☐	☐

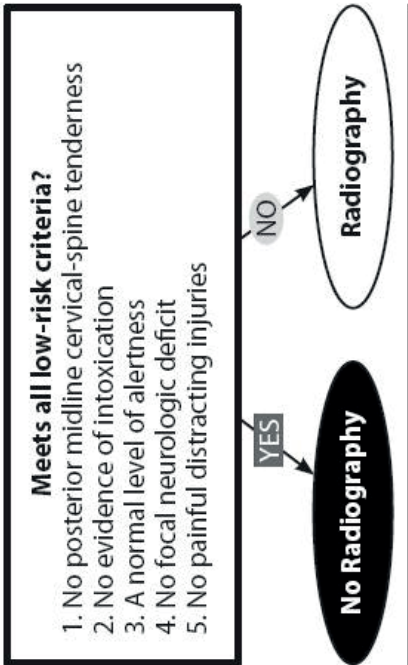
24. Comente ou sugira alterações à Estratégia 8 "Análise de Decisão Multicritério" para a sua adequação ao contexto clínico pós-anestésico.

Estratégia 9. **National Emergency X Radiography Utilization Study [NEXUS®]**

O NEXUS (National Emergency X-Radiography Utilization Study) é constituído por um conjunto de critérios para decidir que vítimas de trauma não precisam de exames de imagem da coluna cervical. De acordo com estas directrizes, se todos os critérios forem cumpridos, as radiografias laterais do pescoço são desnecessárias em vítimas de trauma. O NEXUS® inclui cinco critérios: ausência de sensibilidade na coluna cervical, ausência de evidência de intoxicação, sem alteração do estado de consciência, ausência de lesões neurológicas focais e ausência de lesões distrativas.

NEXUS Criteria for C-spine Injury

Figure 11. National Emergency X-Radiography Utilization Study (NEXUS) Criteria



25. Em relação à Estratégia 9 "NEXUS®", como avalia:

Marcar apenas uma oval por linha.

	Não sei	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo	Concordo totalmente
Relevância	☐	☐	☐	☐	☐	☐
Aplicabilidade	☐	☐	☐	☐	☐	☐
Concordância	☐	☐	☐	☐	☐	☐

26. Comente ou sugira alterações à Estratégia 9 "NEXUS®" para a sua adequação ao contexto clínico pós-anestésico.

Estratégia 10. **Conjunto de ferramentas que inclui o Modelo 4A, o Preceptor de Cinco Minutos (5MP), o Método "Pensar em Voz Alta" (TAM), o Questionamento e o Feedback [Toolkit comprising 4A Model, Five Minute Preceptor (5MP), think aloud method (TAM), questioning and feedback]**

Este conjunto de ferramentas integra várias estratégias para criar uma abordagem abrangente. Combina o **Modelo 4A** (Ancorar, Acrescentar, Aplicar, Afastar), **Preceptor de Cinco Minutos** (obter um compromisso, indagar evidência cinética de apoio, ensinar regras gerais, reforçar o que foi bem feito, corrigir erros), **Método Pensar em Voz Alta** (verbalizar os pensamentos em voz alta enquanto se executa uma tarefa ou atividade de resolução de problemas), **Questionar** (fazer uma série de perguntas para estimular o pensamento crítico, aprofundar a compreensão e promover o envolvimento ativo com o assunto) e **Feedback** (informação fornecida sobre o desempenho ou compreensão de uma tarefa, conceito ou competência).

27. Em relação à Estratégia 10 "Modelo 4A, 5MP, TAM, Questionamento e Feedback", como avalia:

Marcar apenas uma oval por linha.

	Não sei	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo totalmente	Concordo
Relevância	☐	☐	☐	☐	☐	☐
Aplicabilidade	☐	☐	☐	☐	☐	☐
Concordância	☐	☐	☐	☐	☐	☐

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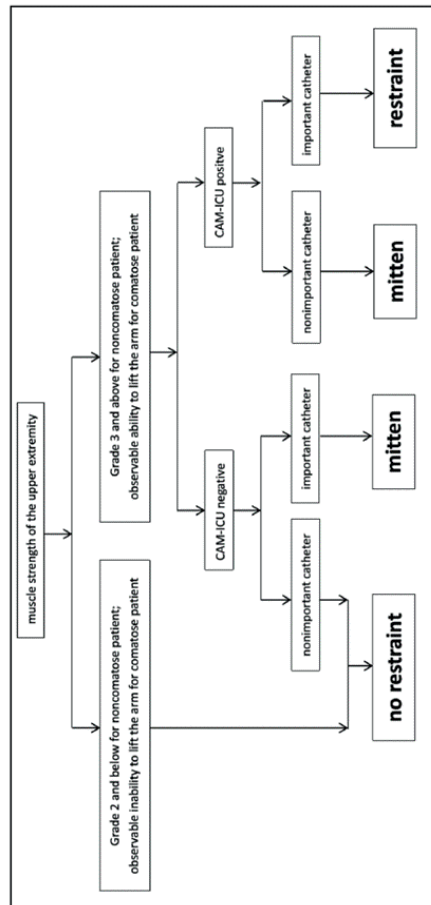
Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

28. Comente ou sugira alterações à Estratégia 10 "Modelo 4A, 5MP, TAM, Questionamento e Feedback" para a sua adequação em contexto clínico pós-anestésico.

Estratégia 11. **Árvore de Decisão de Restrição Física [Restrained Decision Tree - RDT]**

A **Árvore de Decisão de Restrição** é uma ferramenta eficaz para a tomada de decisão para o uso de contenção física dos membros superiores, mantendo a segurança do doente crítico adulto. Inclui a avaliação da força muscular dos membros superiores, o estado de consciência e a determinação da importância/funcionalidade do cateter.

Restraint Decision Tree



29. Em relação à Estratégia 11 "Árvore de Decisão de Restrição", como avalia:

Marcar apenas uma oval por linha.

	Não sei	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo totalmente
Relevância	☐	☐	☐	☐	☐
Aplicabilidade	☐	☐	☐	☐	☐
Concordância	☐	☐	☐	☐	☐

30. Comente ou sugira alterações à Estratégia 11 "Árvore de Decisão de Restrição" para a sua adequação em contexto clínico pós-anestésico.

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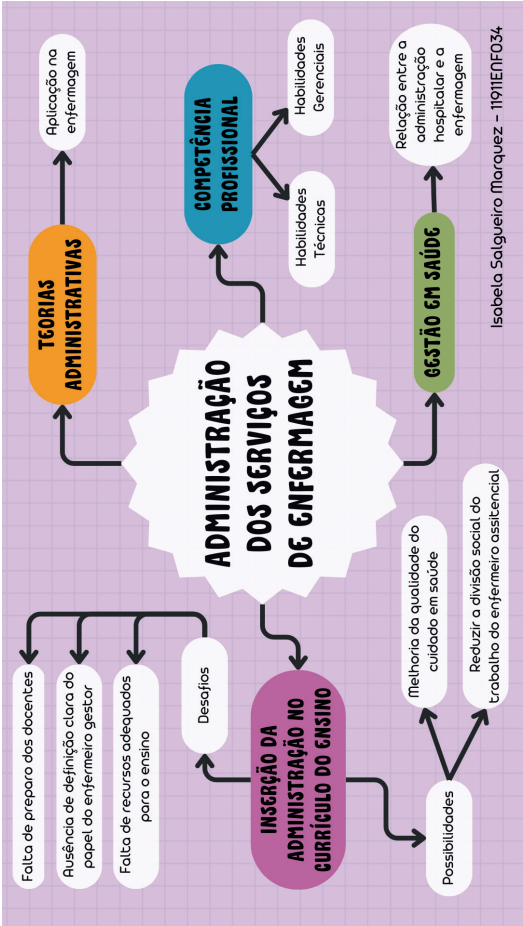
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Estratégia 12. Mapeamento de Conceitos em Equipe [Team Concept Mapping - TCM]

O mapa de conceitos é uma ferramenta visual para descrever ideias relacionadas num tópico principal. É usado para definir, explicar e analisar estruturas complexas de pensamento ou processos, dividindo uma grande ideia em pequenas partes, tornando os pormenores mais fáceis de entender.

É estruturada mas adaptável, organizando as ideias da equipa e representando-as visualmente em mapas interligados, reflectindo as percepções das partes interessadas e fornecendo resultados imediatamente utilizáveis. Facilita o trabalho em equipa e o desempenho, incentivando a comunicação entre os membros, promovendo uma análise eficaz das tarefas e fomentando o debate e a consideração de múltiplas perspectivas e conhecimentos integrados.

Mapeamento de Conceitos em Equipe (exemplo)



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31. Em relação à Estratégia 12 "Mapeamento de Conceitos em Equipa", como avalia:

Marcar apenas uma oval por linha.

	Não sei	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo	Concordo totalmente
Relevância	☐	☐	☐	☐	☐	☐
Aplicabilidade	☐	☐	☐	☐	☐	☐
Concordância	☐	☐	☐	☐	☐	☐

32. Comente ou sugira alterações à Estratégia 12 "Mapeamento de Conceitos em Equipa" para a sua adequação em contexto clínico pós-anestésico.

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Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

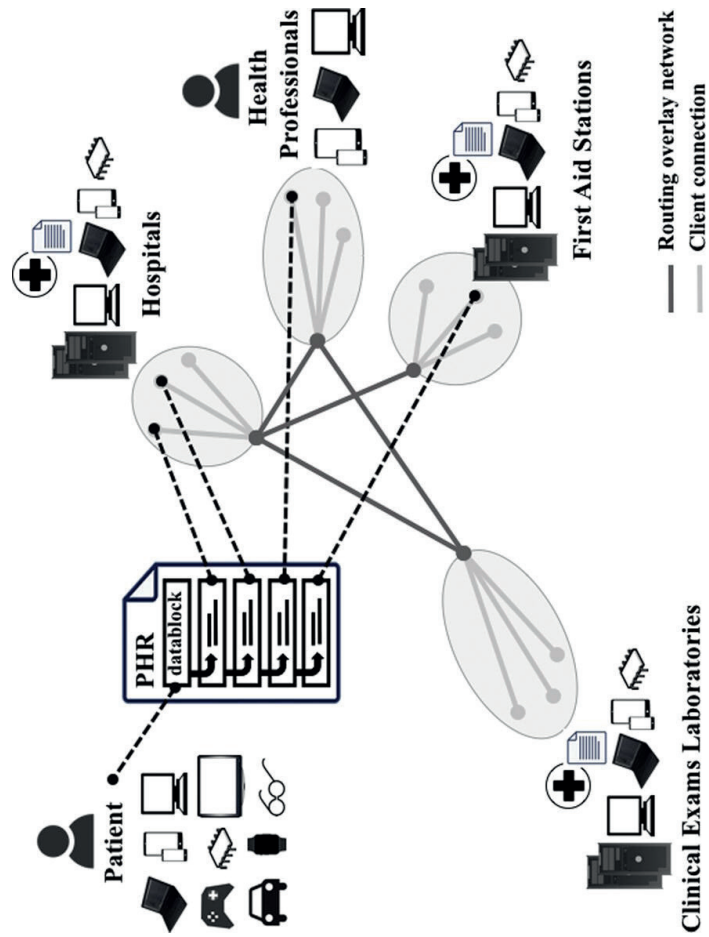
Estratégia 13. Apoio à Decisão Clínica entre Doentes e Prestadores de Cuidados de Saúde com o Registo de Saúde Pessoal [Shared Patient-Provider Clinical Decision Support Services with Personal Health Record - SDM-PHR]

Integração digital de PHRs para apoio à decisão clínica. Capacita os doentes, dando-lhes acesso às suas informações de saúde e envolvendo-os na tomada de decisão. Conduz a planos de cuidados mais personalizados e eficazes, melhorando potencialmente os resultados em termos de saúde. Simplifica a partilha de informações, reduzindo a redundância e melhorando a eficiência dos fluxos de trabalho clínicos. Aumenta a transparência, criando confiança entre os doentes e os prestadores de cuidados de saúde.

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34/44

PHR exemplo



23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

33. Em relação à Estratégia 13 "Apoio à Decisão Clínica entre Doentes e Prestadores de Cuidados de Saúde com o Registo de Saúde Pessoal", como avalia:

Marcar apenas uma oval por linha.

	Não sei	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo totalmente
Relevância	☐	☐	☐	☐	☐
Aplicabilidade	☐	☐	☐	☐	☐
Concordância	☐	☐	☐	☐	☐

34. Comente ou sugira alterações à Estratégia 13 "Apoio à Decisão Clínica entre Doentes e Prestadores de Cuidados de Saúde com o Registo de Saúde Pessoal" para a sua adequação em contexto clínico pós-anestésico.

23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

Estratégia 14. Forma Universal das Opções de Tratamento [Universal Form of Treatment Options Decision Boxes - UFTO]

A tomada de decisão de não reanimação é difícil. O UFTO é constituído por caixas de decisão onde são apresentados resumos clínicos concisos que integram a evidência científica e oferecem informações sobre as opções de tratamento adaptadas (reanimar/não reanimar). A abordagem UFTO permite: ser universal; documentar primeiro as discussões e as condições clínicas; clarificar os objectivos do tratamento global (tratamento ativo ou cuidados de suporte óptimos); contextualizar a decisão de reanimação entre outras decisões de tratamento; ter uma caixa de texto livre para "optar por não participar" em tratamentos invasivos.

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37/44

23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

Universal Form of Treatment Options [UFTO] (frente)

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Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidade de Cuidados Pós-Anestésicos: consenso de peritos

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Universal Form of Treatment Options

Addressograph

Relevant information about patient's situation:

Details of discussion (and/or reasons for not having one, if none has taken place):

Please continue overleaf

This patient is for the following treatment plan: (please sign one of the below boxes, add documentation where appropriate, complete the resuscitation box, and sign and date)

ACTIVE TREATMENT
e.g. investigations, surgical and medical interventions and treatments, referral to on-call doctors or outreach in event of deterioration

Signature.....Date.....

OPTIMAL SUPPORTIVE CARE
e.g. analgesia and other comfort measures. This includes minimally invasive treatments (such as paracetamol) to improve symptom control/quality of life. **The patient's comfort should be the priority in determining care.**

Signature.....Date.....

Active Treatment usually includes:
Organ Support or High Dependency Unit if needed and appropriate (NIV, dialysis, inotropes, venous monitoring, cardioversion, etc.) and
Intensive care if needed and appropriate (intubation and ventilation, support of multi-organ failure, etc)

If you wish to provide guidance on specific interventions please do so below:

This patient is **FOR attempted CARDIOPULMONARY RESUSCITATION** in the event of a cardiac arrest

Signature.....

This patient is **NOT FOR attempted CARDIOPULMONARY RESUSCITATION** in the event of a cardiac arrest

Signature.....

This form is for review: NO / YES, at the following frequency: _____

39/44

https://docs.google.com/forms/d/1IL-qtaxixJBBddtYspSLWSN4JrHrBrAt_JXbLSO3oT4/edit

23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

Name	Signature	Date and Time	Designation
			ST3 or above (consultant to counsellor) within 72 hours
			Consultant
			Nurse informed
(Note: if the form is unfilled, unclear, unsigned or missing, the patient is FOR consideration of all active treatments including resuscitation)			

Universal Form of Treatment Options [UFTO] (verso)

Instructions for Review: Signature of Doctor overleaf indicates that this form is valid as at the time of signing.
If any alterations are made to original decisions, then please sign changes. If review boxes are full below, a new form must be started.

Note: This form may be temporarily revoked in the context of a procedure which may induce cardiac arrest eg pacing, angiogram, other (please specify).			
REVIEW has taken place on			
Date and time	Name	Signature	Designation

FREE TEXT for clinical team, patient and next of kin/lasting power of attorney, to include details (attaching relevant documents to the form where appropriate) of advance decisions, personal health plans, preferred priorities of care, and any other specific treatment(s) for which the patient does or does not wish to be considered, as well as details of discussions which have taken place.	Signature and Date

23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

35. Em relação à Estratégia 14 "UFTO", como avalia:

Marcar apenas uma oval por linha.

	Não sei	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo	Concordo totalmente
Relevância	☐	☐	☐	☐	☐	☐
Aplicabilidade	☐	☐	☐	☐	☐	☐
Concordância	☐	☐	☐	☐	☐	☐

23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

36. Comente ou sugira alterações à Estratégia 14 "UFTO" para a sua adequação em contexto clínico pós-anestésico.

A palavra ao Perito: estratégias adicionais

37. Sugere alguma estratégia adicional que não tenha sido aqui apresentada? Se sim, porque considera ser importante para o apoio ao raciocínio clínico no contexto pós-anestésico?

Este conteúdo não foi criado nem aprovado pela Google.

Google Formulários

https://docs.google.com/forms/d/1IL-qtaxixJBBddtYspSLWSN4JrhHbrAt_JXbLSO3oT4/edit

43/44

Capítulo V

O conhecido desconhecido: aprofundar a compreensão da incerteza no raciocínio clínico na prática de enfermagem

Este capítulo inclui 1 manuscrito publicado

Disseminação

Resumos em atas de eventos científicos

Cunha, L.D.M., Pestana-Santos, M., Lomba, L., & Reis Santos, M. (2024). The unknown known: deepen our understanding of uncertainty in nursing practice. Abstract Book of *27th International Nursing Philosophy Conference "Wondering about Nursing: the bedrock of nursing philosophy"*, Ioannina.

Comunicações em Conferência:

Cunha, L.D.M., Pestana-Santos, M., Lomba, L., & Reis Santos, M. (2024). The unknown known: deepen our understanding of uncertainty in nursing practice. *27th International Nursing Philosophy Conference 'Wondering about Nursing: the bedrock of nursing philosophy'*, Ioannina.

Cunha, L.D.M., Pestana-Santos, M., Lomba, L., & Reis Santos, M. (2023). Perspectives of Schön's Reflective Practice on Nursing Reasoning Under Uncertainty. *26th International Nursing Philosophy Conference 'Wondering about Nursing: the bedrock of nursing philosophy'*, Sidney.

MANUSCRITO 9: Unravelling Uncertainty Inception: When We Really Know That We Don't Know?

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ORIGINAL ARTICLE

Unravelling Uncertainty Inception: When We Really Know That We Don't Know?

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ABSTRACT

Through technical rationality, healthcare professionals address instrumental problems by applying the theory and technique arising from scientific knowledge. Nevertheless, the divergent situations of practice characterised by uncertainty, instability, and uniqueness place nurses in a positivist epistemological dilemma. Decision-making under uncertainty is a challenge that nurses face in clinical practice daily. Nurses anticipate critical events based on the interaction between (un)known factors of clinical reasoning, putting uncertainty tolerance into perspective. With undeniable epistemological relevance, few nursing researchers have addressed this issue. Based on the insights garnered from the panel held at the 26th International Nursing Philosophy Conference, this discussion paper examines the inception of uncertainty within nursing reasoning, intertwining introspection, abstraction, and the rich discussions from the conference. Accordingly, the philosophical underpinnings of the perceived experience of uncertainty will be briefly addressed, while framing the decision-making challenges faced by nurses. A compelling dimension of nursing care emerges when we delve into the inception of uncertainty, prompting a deeper examination of the interplay between its perception and consciousness in clinical practice, and the gravitation of uncertainty in the process of empirical reasoning. Navigating uncertainty involves varying individual responses, influenced by tolerance levels. Moral appropriateness is determined by their adaptability rather than solely their positivity or logical consistency, highlighting constancy as a quality demanding alignment with an understanding of challenges.

1 | Introduction

'To teach how to live without certainty, and yet without being paralysed by hesitation, is perhaps the chief thing that philosophy, in our age, can still do for those who study it' (Russell 2020, p. 14).

Throughout our nursing practice, our decision-making often relies on nonanalytic and intuitive reasoning processes, functioning almost like autopilot. We navigate patient care by

instinctively responding to external cues, tapping into unconscious processes to guide our actions (Kahneman and Henik 2017). This abductive reasoning involves mobilising clusters of knowledge, often referred to as 'scripts', to make normative, day-to-day judgements, where cognitive effort for decision-making is minimised (Tomkins 2008). It is plausible that within the nursing profession, the convergence of aesthetic projections and the surrounding environmental influences, gradually subsumes a part of our consciousness, resembling a

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1 of 10

mantle that envelops us, leaving us to navigate through life until inception occurs (Senivongse and Bennet 2022). In this context, the power of an idea only takes hold if the *'thinker'* realises that its origins emanate from their own psyche.

Uncertainty is the metacognitive and conscious awareness of ignorance (Han et al. 2021). The acknowledgement of the intricate nature of uncertainty is inherently intertwined with the taxonomic framework that classifies uncertainties according to our understanding of the external world and our cognisance of our own knowledge state (Djulgovic, Hozo, and Greenland 2011). The power of uncertainty inception can be strengthened when nurses perceive it as instigating in their own psyche, fostering a sense of ownership over their path of reasoning, that is, 'learning to transform oneself' as a process and a result of human activities (Renigere 2014). The interplay between observed, observable and unobservable realities express uncertainties characterised by a lack of knowledge about what is known (unknown knowns), what is recognised as unknown (known unknowns) and the challenge of not knowing what remains unknown (unknown unknowns) (Djulgovic, Hozo, and Greenland 2011).

The Webster's Collegiate Dictionary defines the term 'inception' as an origin or the point at which something begins its course or existence (Collegiate 1996). Through Russell's notion of 'meaning', the genuine designation of properties, and thereby the consequent attenuation of the essence of propositions, is the epistemological channel through which we can cognitively access the world beyond the narrow limits of our 'direct knowledge' (Russell 2020).

The concept of uncertainty inception is intriguing in nursing care. Quantum indeterminacy, often illustrated by Schrödinger's cat paradox, posits that until an observation is made, a system exists in multiple states simultaneously. This means the cat in the box is both dead and alive until someone observes it, collapsing the superposition into a single state (Schrödinger, 1935). This principle of uncertainty parallels the challenges of clinical reasoning, where the inception of uncertainty can remain indeterminate until awareness occurs. The assertion of uncertainty about external reality seems to be designated by its subject term and its predicates that this reality exist (Salmon 1998, 2003). Much like Schrödinger's cat remains in a state of superposition until observed, the nature of uncertainty in nursing care persists in a fluid state until it is confronted and examined. Uncertainty is not a tangible concept with predicates in the traditional sense. Instead, the existence of uncertainty is designated by attributing to it a subject term and predicates as a way to conceptualise and communicate about its nature and implications. Nurses must be deeply attuned to the need for developing a heightened awareness in the face of uncertainty for transformative care to occur.

Similarly, the diverse layers of the clinical reasoning process in nursing care give rise to distinct realities (Wiedenbach and Wiedenbach 1970), blurring or extending the boundaries between perception and reality. This aspect resonates with the works of René Descartes, through his cogito argument, 'cogito ergo sum' (I think, therefore I am) (Descartes 2016). Descartes laid a foundational cornerstone in the pursuit of tangible reality.

The fundamental tenet of Descartes' philosophy asserts the certainty of our existence, as even amidst radical doubt, the very experience of doubting itself provides self-evidence of our status as thinking beings (Descartes 2016). We can consistently rely on the certainty that our ability to think confirms our existence in some way—we are therefore 'thinking things' (Watson 2007). However, the precise nature of reality remains elusive, particularly when considering the perspectives of radical scepticism. Descartes concluded that the only certainty lies in the state of doubt. When facing the experience of uncertainty, sensations and perceptions that seem undeniably real can be generated, which leaves us unable to definitively differentiate their realness (Cunha et al. 2023). The dynamic interplay between certainty and doubt is a fundamental aspect of human experience, marked by a tension between the desire for clarity and the recognition of the inherent value in uncertainty (Braslow et al. 2012). Society's inclination towards conformity and the pursuit of a shared reality underscores the human quest for clear, definitive answers to complex questions. However, amidst this quest, there's a growing recognition of the profound insights that uncertainty can offer across various dimensions of human cognition, emotion, and behaviour (Braslow et al. 2012). Despite this recognition, research into the integration of self-questioning practices, reminiscent of the cooperative argumentation aligned with the Socratic dialogue, within the nursing profession remains relatively limited. These practices have the potential to illuminate the intricate nuances of nurses' reasoning abilities, fostering a deeper understanding of their decision-making processes. Embracing uncertainty and fostering a culture of self-questioning can catalyse a paradigm shift towards critical enquiry and continuous improvement. The lens of self-reflection and uncertainty is distinct but essential to understanding the inception of uncertainty in nursing reasoning. By recognising the importance of self-questioning and introspection, we gain a deeper insight into how uncertainty manifests itself, heading to a more nuanced appreciation of uncertainty's role in clinical decision-making. By empowering nurses to challenge assumptions, reassess their approaches, and confront gaps in their knowledge base, this approach not only enriches professional development but also opens doors to innovative scientific discoveries (Kazantzis and Stuckey 2018). In essence, encouraging professionals to engage in rigorous self-reflection and questioning not only strengthens their clinical practice but also drives advancements in evidence-based care delivery. It underscores the importance of embracing uncertainty as a catalyst for growth and innovation within the nursing profession.

In the context of nursing care, the challenge is not only to recognise the subjective experiences of uncertainty in clinical reasoning, but also to interpret and respond to these experiences in line with the core purposes of nursing. But what if there is no doubt? What if there is no awareness of uncertainty? A critical approach to reading reality has a requirement to 'doubt', a requirement on the part of the critic/analyst to assume a position of doubt the target of scrutiny (the object) (Patterson 1997).

A key element in the art of critical analysis is confidently presenting the object under scrutiny, without hesitation. Instead, the focus of the analysis is to compel the subject to reveal itself

as a product of social construction, historical context, and cultural influences as much as the individual scrutinising it (Patterson 1997). The intention is to render the object or idea as problematic, uncertain, plural, and intricate, emphasising its social, cultural, and historical underpinnings. Simultaneously, this process demands a profound commitment from the observer to maintain a doubtful and reflexive attitude, acknowledging the temporary nature of the subject and encouraging a continuous critical engagement (Patterson 1997). This approach seeks to unravel the layers of complexity inherent to the object or idea, urging a nuanced understanding that recognises its dynamic interplay with the broader social, cultural, and historical milieu (Patterson 1997). The agnolological assumption (one cannot know) and the analysis of the transcendence of the limits of knowledge can actually help us understand these boundaries better. This, in turn, encourages us to push further and expand what is known (Grayling 2021).

Embracing the opportunity to contemplate the phenomenon of uncertainty, particularly when faced with what appears to be novel and unfamiliar, we aim to examine the inception of uncertainty within nursing reasoning. A multitude of scenarios, narratives, interpretations, and arguments co-exists, and we have yet to discern the right questions, the appropriate methodologies, and potential interpretations and actions stemming from them. While exploring this domain of knowledge, utmost caution and prudence are demanded, as we are challenged by the enigma of the 'unknown', born from the complexities. Understanding this dynamic is crucial in the context of the care process, prompting a necessary reflection while seizing the unique opportunity to address our thought processes and their determinants, which are aspects that may not have been enough enlightened in the literature.

Moreover, the field of nursing, encompassing both scientific knowledge and disciplinary expertise, provides a valuable opportunity for deep contemplation regarding how nurses endeavour to grasp, comprehend, and effectively address the uncertainties inherent in their clinical practice. The manuscript is a reflective exploration on uncertainty in clinical reasoning and its inception, comprising three main sections: an examination of perception and consciousness of uncertainty in clinical practice, an analysis of uncertainty's impact on empirical reasoning, and a discussion on fostering uncertainty tolerance through the concepts of 'thinking in' and 'acting as if'. The final section presents a newly synthesised argument derived from the overarching themes and discussions of the panel held at the 26th International Nursing Philosophy Conference.

1.1 | Perception and Consciousness of Uncertainty in Clinical Practice

The willingness to recognise or ignore uncertainty at different levels stems from the perceptual object, in which the perceptual identity is captured through the identification process of *to be is to be perceived* (Berkeley 1999). One of Protagoras arguments in defence of perception points out that the human being is the measure of all things, suggesting that our perceptions define reality (Platon 2023). Understanding the correlation between our perceptions—the way we comprehend the world—and the

existence of things independently of our perceptions, known as objective reality, poses a significant philosophical challenge.

As a complex adaptive system, the human being co-evolves through both reactive and proactive adaptation to its environment. This process comprises partially ordered systems that evolve while operating within a perpetual state of imbalance, which contributes to the system's inherently unpredictable behaviour. The dynamic nature of these systems highlights the need for further exploration, particularly concerning the understanding of its influence in the human behaviour and the mechanisms through which humans interpret signals, leading to the expression of actions (Bennet and Bennet 2013). Informed by internal neurological, cognitive, and physiological factors, as well as contextual variables, the interpretation of signals—whether they originate from real-world stimuli, imagined scenarios, or implicit cues—is intricately linked to distinguishing phenomena occurring within and outside the body. For example, when a nurse experiences neurological fatigue from extended shifts, their impaired concentration can affect their ability to accurately interpret complex patient data and detect subtle changes in vital signs. Cognitive factors are activated when a nurse anticipates potential complications during a surgical procedure based on past experiences, proactively guiding their actions. Physiological factors are activated when a nurse in the operating room experiences increased heart rate and sweating due to the high-stress environment, which can impact their ability to maintain steady hands and focus on critical tasks during the technique. Contextual variables, such as operating with limited personnel resources during lunchtime, require a nurse to adapt their task priorities and decision-making strategies to ensure critical needs are addressed effectively compared to a fully staffed shift. This process involves discerning the nuances of sensory input and its relevance to internal states and external circumstances. In essence, this highlights the dynamic nature of human perception and decision-making processes as individuals strive to understand and respond to behavioural cues, adapting accordingly.

Perception denotes how we interpret and give meaning to the world through our senses, thoughts, and personal experiences, often resulting in subjective interpretations that vary among individuals. Concerning the interpretation of the world, the process of semiotic analysis becomes relevant. It involves representing something in an iconic, indexical, or symbolic manner to convey meaning (Senivongse and Bennet 2022). The approach encompasses abstract, theoretical, unobservable, or non-existent objects and properties and is rooted in the theoretical frameworks developed by two influential scholars, namely Ferdinand de Saussure and Charles Sanders Peirce (JISH 2020).

Saussure's theory challenged traditional notions of meaning by asserting that meaning is derived from the relationships between signs within a linguistic system. Accordingly, individual words and sounds carry no inherent significance; the word triggers different mental concepts in each individual, all related to the idea *per se*. Saussure's focus was not on the correspondence of signs to external reality (signification), but on understanding the relationship between the signifier and the

signified, and how signs relate to each other within a language system (JISH 2020). Although a significant portion of our vocabulary comprises nouns, a considerable number of these words denote abstract concepts rather than physical entities, that is a sign does not indicate a particular thing: it denotes 'a kind of thing'. Saussure's emphasis lies in the verbal meaning and the relationship between the signifier and the signified. The disconnection between signifiers and signifieds presents two significant challenges. Firstly, every use of a signifier generates a multitude of mental concepts, varying based on personal, environmental, and cultural experiences. This multiplicity extends beyond literal meanings to encompass connotations shaped by social and cultural contexts. Secondly, linguistic signs are arbitrary, lacking any inherent connection between the signifier and the signified or the sign as a whole and its referent. This arbitrariness extends beyond language and finds relevance in interpreting uncertain information across diverse contexts (JISH 2020). Signs represent something to someone, whether verbal or non-verbal, and Saussure identified three modes of sign relationship: iconic, indexical, and symbolic. An icon represents an object that denotes its inherent character, an index signifies an object representing the value of its own being, and a symbol designates an object indicating something governed by a code of conduct or law (JISH 2020). The process of sign interpretation demonstrates how signs communicate meaning in multifunctional ways, shaping our understanding of the external world. Despite the inherent ambiguity and uncertainty in language, we manage to communicate effectively and accomplish pragmatic tasks. For instance, a nurse might encounter Saussure's three modes of sign relationship: symbolic, as seen in the relationship between a red alert light on a patient monitor and the concept of danger; iconic, as in the use of imaging like X-rays that resemble internal body structures, allowing nurses to identify fractures or abnormalities; and indexical, as in the causal relationship between a patient's elevated temperature and an underlying infection, where the fever directly indicates the possibility of an infection. However, language's limitations become apparent when we strive to articulate complex experiences or 'truths'. The study of signs and meaning challenges the certainty of rational statements and deeply held beliefs, prompting reflection on how we address uncertainty. This layered approach to meaning-making is crucial in healthcare, where effective communication and interpretation of signs can significantly impact patient outcomes. The inherent ambiguity and uncertainty in language, as explored through semiotic theory, challenge the certainty of rational statements and beliefs, reminding us of the nuanced and dynamic nature of human communication and understanding.

Conversely, objective reality refers to the existence of elements unaffected by our perceptions or interpretations, emphasising the presence of immutable facts and truths irrespective of our awareness. Consequently, questions arise regarding the alignment of our perceptions with reality, the reliability of our senses in accurately perceiving reality, and the inherent nature of reality itself. Hence, is knowledge perception?

'Pure' knowledge cannot be merely perception, because, for instance, under the same wind, one person may feel cold while another does not. Knowledge, therefore, lies not in the sensation itself but in our ability to reason about it (Platon 2023).

Individual perceptions vary, with one person feeling hot and another cold depending on their accustomed climates. While subjective experiences are valid, they can sometimes be unreliable. For example, if someone's perception of cold includes concerns about frozen pipes, it might be less about the sensation and more about the interpretation, which can be flawed (Platon 2023). Additionally, Nietzsche (2022) posits that facts are inherently tied to interpretations, meaning that all information is filtered through a particular lens, making interpretation selective by nature.

Enactivism, a theory of perception, seeks to bridge the gap between direct and indirect realism by proposing that cognition is a dynamic interplay between an organism's sensory-motor capabilities and its environment. This perspective challenges the notion of perception as a passive process dictated solely by the properties of an independent world. Instead, enactivism argues that the organism and its environment are structurally coupled, co-determining each other's existence and interactions (Varela, Thompson, and Rosch 1991). Minds develop through the dynamic, self-creating, and self-sustaining activities of living organisms as they interact with their environment. Central to this view is the idea that an organism's sensorimotor patterns are shaped by its history of active engagement with environmental features. These past interactions reinforce and maintain the organism's habitual sensorimotor behaviours. However, organisms are not merely products of their past behaviours; they remain capable of adapting and modifying their behaviours in novel ways. Cognition, characterised by flexible, open-ended, and extended spatio-temporal activity, is seen as 'autonomous' because it unfolds in ways that support the organism's self-sustenance, independent of external regulation or pre-determined programming (Varela, Thompson, and Rosch 1991). Also, the empirical search for consciousness encompasses the intentionality of consciousness and 'qualia', that is, phenomenal consciousness or consciousness access (Grayling 2021). Neuroscience continues to be challenged to explain how the experience of qualia emerges from brain activity, that is, its attentional amplification.

We acknowledge the 'epistemology of practice' of Schön, whereas the professional is seen as a transactional agent/experiencer who shapes and becomes part of the situation (Schön 1987). Similarly, Hume (2000) rejected the notion of innate ideas, asserting that all human knowledge originates solely from experience. Being aware must be considered an essential aspect of an object receiving attention, or of the subjective experience of being in that state of awareness (Grayling 2021). The professional's perception of the situation must include a sense of their own contribution to it: an 'inside-out' approach complements an 'outside-in' approach (Schön 1987). As a result, a distinction between accessing our consciousness and overseeing our consciousness (meta consciousness) has to be made to be self-reflexively aware of one's experience to reason, plan, direct one's activities and communicate with others (Grayling 2021).

Reflective practice presupposes attention to practice epistemology, which attends to conceptions of tacit professional knowledge generated through reflection for, in and on practice. The active construction of practice reality starts from the

awareness of the variety of available structures, resulting in the need to reflect on the previously tacit structures in action. By making implicit structures explicit, nurses become aware of alternative ways of framing the reality of practice. The individual assesses the values and norms which have been prioritised and those which have been set aside. Through this process, awareness of tacit structures prompts awareness of additional possibilities for action. Critical evaluation of one's own behaviour as a means of developing skill in the workplace, in which thought and action are integrated in a dialectical process, is integrally linked to the *'dialogue of thinking and doing through which I become more skilful'* (Schön 1987, p. 31).

Clarity in perception opens up the potential for alternative gifts and futures if nursing actively chooses to embrace enthusiasm and emotion with authentic engagement rather than detached them from philosophy or rigour (Dillard-Wright et al. 2023). States of doubt stimulate the generation of ideas. 'Doubt' and 'uncertainty' are related concepts, but they are not entirely interchangeable. 'Uncertainty' typically refers to a condition of not knowing or lacking complete knowledge about a particular situation, outcome, or course of action. It encompasses ambiguity, unpredictability, and complexity. 'Doubt' typically relates to a lack of certainty or confidence in a person's thoughts or decisions. It is more closely aligned with epistemological concerns, reflecting a philosophical enquiry into the nature and limits of knowledge itself. In the context of nursing, both uncertainty and doubt can manifest in various ways, influencing clinical reasoning and decision-making processes. Thinking reflectively leaves gaps in our minds that beg to be filled, awakening us in a quest for ideas to unravel the surrounding enigmas (Camps 2021). Nurses must navigate these complexities skillfully, employing strategies to mitigate uncertainty and address doubt while maintaining a patient-centred focus and adhering to professional standards of care.

Circumstances in which people have doubts or uncertainties regarding a certain idea or solution lead them to consider other options. Here, scepticism serves as a stimulant for invention and creativity, pushing people to think outside the box and challenge preconceived notions. Uncertainty, however, can also encourage the development of ideas since it forces people to look for information and consider other options to close knowledge or comprehension gaps. Instead of turning away from acknowledging the truths obscured by defensive denial, nursing could recognise a generative and liberating path. The usefulness of the will to progress towards reason in respect of what presents itself as attractive can be noticed, since *'every thing endeavours, as long as it is in itself, to persevere in its being'* (Spinoza 1965, p. 99). This path involves acknowledging uncertainty, thereby presenting a transformative approach to the nursing profession.

1.2 | The Gravitation of Uncertainty in the Process of Empirical Reasoning

Human beings are complex adaptive systems composed of interconnected components that interact in nonlinear ways, featuring feedback loops and dynamic uncertainties, which complicate both the understanding and prediction of human

behaviour (Bennet and Bennet 2013). Changes in one variable often do not result in proportional changes in another, and unstable feedback loops—whether reinforcing or balancing—can arise if not managed properly. As these systems evolve, their unpredictability increases, adding further complexity to predictions. The interactions among their constituent elements often lead to the emergence of global properties, suggesting that behaviours can arise from interactions rather than from individual components alone. Due to the nonlinearity and unpredictability of these characteristics and relationships, tracing these emergent properties to their specific connections is challenging, complicating the identification of the precise factors contributing to their manifestation (Senivongse and Bennet 2022). Imagine a nurse in a post-anaesthesia care unit (PACU), diligently monitoring a patient's post-surgery. Unexpectedly, the patient displays symptoms of respiratory distress and altered mental status, diverging from anticipated post-operative recovery patterns. The healthcare team faces the daunting task of promptly assessing and responding to these ambiguous symptoms, carefully balancing the imperative for immediate intervention with the nebulous nature of the underlying cause. In such complex scenarios, nurses use clinical reasoning to predict the unpredictable by continuously integrating and reassessing real-time data, balancing the interactions between multiple variables, and adapting their care plans to address emergent issues. This involves recognising familiar patterns (non-analytical reasoning) and drawing links between various signifiers that may support their evolution and adaptation to unpredictability (analytical reasoning). This dynamic process is essential for effectively navigating the intricate and evolving nature of uncertainty in healthcare.

The complexity of nursing interventions, the subjective experiences of uncertainty and the intricate dynamics of the care environment contribute to a multifaceted tapestry in which the boundaries between what is perceived and what is objectively real become intertwined. The term 'empirical reasoning' is used to denote the process of acquiring such knowledge, involving premises justified by observation, nondeductive reasoning, and adequate justification for conclusions (Huemer 2017). Empirical knowledge is characterised by direct observation, deductive inference from observations, and nondeductive inference, particularly through induction and inference of the best explanation (Huemer 2017). However, an argument exists positing that there is no pure empirical reasoning: as all cases, satisfying the criteria, still lack the absence of reliance on a priori justifications for synthetic claims. By nature, empirical reasoning demands backstage cognitive attitudes that resist justification through observations, logic, or concept analysis, and challenge the tenability of non-sceptical empiricism as an epistemological doctrine (Huemer 2017). In essence, this prompts an exploration into the nature and ultimate realisation of knowledge concerning the comprehensive understanding of existence (Heidegger 2023).

In Kant's Critique of Pure Reason, metaphysics holds the central position as the primary knowledge concerning being in its entirety and totality. Within this philosophical interpretation, an intriguing question arises about the essence of knowledge regarding being in totality (Heidegger 2023). Specifically, how does the culmination of knowledge about being occur as a

whole? An incisive way of affirming knowledge is the sceptical challenge. Claims of knowledge must contemplate even the most abstruse ideas and notions in a constant epistemological challenge, if aiming to genuinely understand and expand our understanding (Grayling 2021). Do we know anything? Can we know anything? Descartes used heuristics as the facilitating means to explore whether we can know something with certainty (Descartes 2016). So, rather than acquiring knowledge in the strict sense, we may more appropriately accept that what we can best reach is a credible and well-founded belief (Grayling 2021). Science recognises itself as refutable, that is, subject to adjustment or revision in light of new evidence (Grayling 2021). The inception of uncertainty is therefore a different disposition towards embodying uncertainty within a new way of reasoning, leading to a moment of sudden insight: an 'Eureka moment'. This view aligns with Kant's conception of judgement, which he defines as the faculty that mediates between the particular and the universal (Kant 2008). Judgement acts as a crucial intermediary between the sensitive world, shaped by our sensory experiences, and the intelligible world of abstract concepts. Through judgement, we contemplate the former from the perspective of the latter, thereby revealing alternative paths of intelligibility within nature and extending beyond the boundaries of our established categories of knowledge, namely reason and understanding. Thus, judgement's function is to transcend the abyss between these realms, unveiling new dimensions of understanding that challenge and expand our existing knowledge frameworks (Kant 2008).

A critique by Dillard-Wright et al. (2023) recognises the presence of an epistemic void that perpetuates the generation of knowledge through the obliteration of ontological foundations (relating to the nature of being). The significance of this discourse lies in critically examining what nursing preserves by enforcing silence, non-knowledge, and ignorance. The ingrained image of the 'good nurse', praised for the dedicated and virtuous labour, has significantly influenced the landscape of nursing practice and its boundaries (Fealy 2004). Indeed, idealised portrayals of nurses might hinder nursing reasoning. Nursing's promotion of these dogmas could inadvertently perpetuate stereotypes and undermine its (re)cognition. Consequently, nurses may find themselves adopting characteristics linked to the idealised 'good nurse', shaping their professional practice. Despite being a fabrication, the notion of the 'good nurse' was deliberately crafted to serve various agendas, often functioned to uphold the existing status quo (Fealy 2004). The pursuit of 'truth' fades dominated by 'noise', where messages vie for attention and drown out others. Nurses need to stay alert to the underlying messages and rhetoric embedded within discourse. Understanding that discourse isn't just descriptive but also influential is crucial, as it shapes practices and realities (Fealy 2004). Likewise, achieving a generalised consensus does not always serve as evidence of knowledge progression (Camps 2021). These deliberate omissions lead to oppression, perpetuating falsehoods and half-truths that are accepted as realities within the field of nursing. The influencing factors that mould our perspectives and can lead us to preconceived notions are called mental frameworks. These frames act as filters through which we perceive reality. The clear identification, understanding and discussion of these filters is essential to enhance unbiased views, preventing them from clouding the

use of reason (Camps 2021). Explicitly acknowledging the risks or perceived risks associated with admitting uncertainty in nursing practice would further emphasise the necessity of questioning entrenched beliefs and promoting an environment conducive to open dialogue and critical enquiry.

Hume highlights the clouds that cover reasoning through common cognitive biases, emphasising that our belief in a conclusion is stronger if the event is more recent or if the observations we draw on are more recent. Additionally, longer and more discontinuous lines of reasoning tend to weaken our belief in the conclusion. Hume also notes that irrational prejudices can form from the over-generalisation of experiences, where imagination is unduly influenced by irrelevant circumstances often observed alongside those that matter. Paradoxically, the only way to correct these pernicious influences of general rules is to follow other general rules formed by reflecting on the case's circumstances and our cognitive limitations (Hume 2000).

During a profound contemplation of positivism, one can underscore the nuanced nature of issues, especially within the domain of clinical reasoning. In advanced nursing practice, heightened specialisation is associated with a heightened awareness of the lack of straightforward distinctions. Despite having established protocols, the intricacies of adjusting and responding to unique individuals and situations inevitably introduce an element of uncertainty into the process. Coffa argues that the positivists' empiricism is unfriendly towards the concept of meaning, given their empiricist foundations (Coffa and Coffa 1991). In essence, Coffa suggests that positivists have embraced the idealism of 'being without meaning'.

Approaching the subject from a critical post-humanist standpoint, the application of algorithmic management in evidence-based nursing, precision nursing, and symptom science within the healthcare practice, depends on extensive research and data to map out patients' journeys and establish authority over bodies (Smith, Klumbyte, and Britton 2023). The implementation of predictive healthcare algorithms carries the risk of perpetuating inherent inequalities rooted in the contexts from which they emerge, shaping potential futures based on established normativities governed by algorithmic biopower (Smith, Klumbyte, and Britton 2023). This underscores the importance of maintaining a critical awareness of traditional thought processes and challenging commonplace understandings from an ethical standpoint (Smith, Klumbyte, and Britton 2023).

However, being a post-positivist is an exhausting endeavour. Acknowledging the existence of truth but recognising the inherent limitations to fully understanding it. The incessant search for more information challenges preconceptions and the adoption of alternative perspectives. Plus, there is no rest in perpetual questioning and self-doubt. Dealing with persistent ambiguity and the incessant search for truth comes at the psychological cost of enduring a diet of incomplete knowledge and generalised uncertainty (Marcel 2020).

The fundamental principle behind info-gap robust satisficing entails the initial identification of crucial outcomes or essential goals that must be achieved (Ben-Haim 2018). This approach

commences by pinpointing the objectives or outcomes that require attainment, serving as guiding principles throughout the decision-making process. Subsequently, the focus shifts towards selecting an option capable of realising these vital outcomes across a diverse range of potential future revelations. This means that the chosen option should be robust enough to withstand various uncertainties and unforeseen developments that may arise. Knowledge is applied in two distinct ways within this decision-making framework. Firstly, it is employed in a positivist manner, assuming the existence of objective reality and the approximation of our understanding to it, to assess the desirability of alternative options. Secondly, it is used to evaluate the vulnerability of options to unforeseen developments, while acknowledging the limitations of positivism in human affairs (Ben-Haim 2018). In other words, this approach operates under the assumption of an objective reality that can be reasonably approximated by our understanding. This enables decision-makers to evaluate the attractiveness of various options based on known factors and outcomes. Conversely, knowledge is also employed to gauge the susceptibility of options to unexpected developments, acknowledging the constraints of our knowledge and the inherent uncertainty within complex systems.

The strategy aims to maximise resilience against strategic uncertainty simultaneously meeting critical requirements and prioritising immunity to error and surprise (Ben-Haim 2018). The outcome may not be optimal, yet it is designed to be satisfactory across a broad spectrum of potential deviations from current understanding. By doing so, stability is upheld, and the adverse effects of unexpected events are minimised. This approach underscores the significance of flexibility, readiness, and proactive measures in efficiently mitigating risks and uncertainties. Ultimately, its goal is to cultivate adaptability and resilience in strategic decision-making processes, thereby promoting sustainability and long-term success. This approach embraces positivism by acknowledging the attainability of objective knowledge about the world. However, it also recognises the inherent unknowability of the vast domains of reality, prompting a decision-theoretical management approach that diverges from traditional predictive optimisation (Ben-Haim 2018). This approach acknowledges the limitations of our understanding of reality and offers a decision-making strategy that is more adaptable and robust in uncertain environments.

The rejection of conventionalism and normativism, wherein axioms are selected through unrestricted agreement once their interpretation or application to the empirical world is affirmed by a particular individual or adheres to a specific set of rules, aligns with Kant's notion of 'possible experience' (Kant 2008). The evident role of empiricism as a regulator and organiser of uncertainty experiences, serving to justify the feasibility of knowledge, essentially takes on the form of an established dogma. This gives rise to the challenge concerning the objectivity of empirical science and, more broadly, the aprioristic nature inherent in a justification endeavour. Similar to the 'possible experience' in the 'transcendental analytics', it implies the fundamental potential for an epistemology that is a priori and theoretically devoid of ontological presuppositions and implications. Therefore, the gravitation of uncertainty in empirical reasoning reveals that 'pure' knowledge, free from doubt

and ambiguity, does not exist. Our understanding of the world is an ongoing process of exploration, interpretation, and revision. Embracing this uncertainty allows for a more nuanced and flexible approach to knowledge, fostering critical enquiry and adaptive practices in fields such as nursing. Recognising the intrinsic uncertainty in empirical (tangible) knowledge challenges us to reconsider our epistemological frameworks and embrace the dynamic, evolving nature of understanding. By doing so, we can navigate the complexities of reality with a more open and reflective mindset, ultimately enhancing our capacity for critical thinking and effective decision-making.

1.3 | Uncertainty Tolerance: Accepting 'Thinking In' and 'Acting As If'

Responses to uncertainty are individualised and influenced by varying levels of tolerance, adding complexity to the decision of whether to 'cure' or alleviate uncertainty (Han 2021; Han et al. 2021). In essence, determining how to effectively manage uncertainty requires consideration of broader moral objectives and a nuanced evaluation of individual and situational factors. This approach transcends a simplistic binary choice between reducing or enduring uncertainty; instead, it necessitates the ability to tolerate uncertainty (Han 2021).

Tolerance, from the Latin *tolerantia* (constancy in suffering), is a term that defines the degree of acceptance in the face of an element that is contrary to a moral, cultural, civil, or physical rule (Editora 2013). According to Locke (2013), tolerance arises when we cease resisting things that are beyond our control. Locke acknowledged the need for caution, emphasising that an excessively strict stance is likely to disillusion and provoke individuals rather than pacify them. This counsel for prudence is not about freedom of conscience but rather about preserving societal order. Although recognising the inherent right of individuals to freedom of conscience, Locke (2013) considers that there is a moral duty to conform to societal norms. Traditional conceptualisations suggest promoting a net 'positivity' in psychological responses to uncertainty, but this approach oversimplifies the complex relationship between psychological and moral valence (Han 2021). The coercion of conformity violates freedom of conscience and encourages hypocrisy and, as a result, suggests that disobedience becomes an obligation (Locke 2013).

Engaging in a brief reflection on uncertainty was expected to enhance tolerance. However, a study by Parker and Ahrens (2022), revealed that the reflection surprisingly increased intolerance of uncertainty; furthermore, individuals with higher mindfulness, particularly the nonreactivity aspect, demonstrated greater tolerance, suggesting the potential value of mindfulness training. Specifically uncertainty intolerance is associated with increased reactivity in the anterior insula and amygdala, alterations in neural responses to rewards and errors observed in event-related potentials, a varied pattern of startle responses to uncertain threats, and impairments in safety learning (Tanovic, Gee, and Joormann 2018). So, do we tolerate uncertainty precisely because we might not have it? What is the alternative?

The moral appropriateness of individual responses is not solely determined by their positivity or logical consistency, but rather

by their ability to facilitate adaptability to the uncertainties encountered (Han 2021). Uncertainty is therefore constancy. Constancy because of its inevitability, constancy because of its persistence. Thus, constancy is lived in the quality of being resolute, firm, or unwavering in one's commitment, despite the trials and tribulations of experience that can threaten to undermine that commitment (Rees and Webber 2014). Constancy demands more than mere attitudinal strength; it necessitates the alignment of our minds to encompass a comprehensive understanding of the challenges that assail the fortress of constancy within us and in the world around us (Rees and Webber 2014). *'Our minds must be so confirmed and conformed that we may be at rest in trouble and have peace even in the midst of war'* (Sellars 2006, p. 32).

We tolerate restlessness, we recognise that there is uncertainty, we accept that it is there, but do we truly accept it? Montaigne talks about the importance of resolution and constancy (de Montaigne and Coste 1685). It is not suggested that we should refrain from taking action to protect ourselves from potential harm and difficulties. It neither implies that we should shun the fear of being caught off guard by adversity. On the contrary, employing all honourable methods to protect ourselves from harm is not only acceptable but commendable. It means enduring inconveniences for which there is no immediate remedy without flinching. Montaigne observes that, whether in the field of philosophy or war, it is perfectly natural for the soul to be frightened by the sinister sounds of thunder or the boom of cannons. Both the philosopher and the warrior are susceptible to mind disturbances, but they manage to keep it within reasonable limits (de Montaigne and Coste 1685). Consistency in the perception of authenticity and integrity of being a person is essential for accepting 'thinking in' and 'acting as if'. It is in the fact the decision between being ourselves, adapting to ourselves and persevering in the face of uncertainty (Grayling 2021).

Nursing practices often navigate through realms of uncertainty, yet the absence of robust philosophies or theories addressing uncertainty leaves us ill-prepared to confront it. Consequently, uncertainty intolerance persists among nurses. The task at hand is to cultivate an attitude of equanimity amidst challenges, enabling nurses to confront uncertainty with resilience and clarity. Clinical guidelines, which synthesise known evidence and present consensus recommendations, can offer the comfort of constancy while allowing flexibility in decision-making. Unlike rigid policies, guidelines are not strictly binding and offer different levels that clarify the quality of the available scientific evidence and the reliability of the information used. They also allow us to consider individual patient factors, such as age, futility of treatment, and patient preferences, before implementing strategies. For example, the Resuscitation Guidelines provide comprehensive protocols for emergency situations, yet they emphasise the importance of individualised patient assessment. This adaptability is vital in high-stress situations where nurses must make quick, informed decisions. This underscores the importance of constancy to navigate through the storms of adversity as clinical guidelines act as a refuge amid these storms, providing structure and support to help us steer through uncertainty with confidence and clarity. This flexibility promotes resilience and the ability to remain

adaptable and tolerant in the face of uncertainty, acknowledging that each clinical situation is unique and irreplaceable.

2 | Dialogue

This manuscript closes with a reflection on the discussions from the 'epistemology and/in nursing' panel at the 26th International Nursing Philosophy Conference, contextualising the insights gained from other panellists regarding how philosophical perspectives shape nursing practices. It explores how nurses navigate uncertainty within evolving healthcare landscapes, deepening the understanding of uncertainty's relevance in nursing and prompting further reflection on its conceptualisation and implications.

Expanding on Professor Miriam Bender's observations, the semiotics of space and time allow a vision of experience mediated by the past present, present present and future present. Bender related the logic of time as 'being in the space', in a reminiscent reversal (Bender 2023). The intriguing concept of 'things that exhibit consistency of characteristics over time' raises questions about how nursing mobilises contingencies, rather than regularities, to achieve outcomes that are perceived as beneficial. When nurses experience uncertainty, they need logic to mediate the event, which is an inspiration for expressing this movement (Bender 2023). Uncertainty involves contingency, indeterminism, and ambiguity, turning nursing into more than just the sum of the fulfilling tasks. Because 'there just is no algorithm for the work of nursing' (Bender 2023, p. 3).

Professor Stephen Padgett brings up the highly structured scientific methodologies in procedures and rules of evidence-based practice as an 'academic ritual defence'. These methodologies serve to align nursing research and philosophy with established norms and standards (Padgett 2017). We are taught to think in a certain way, and we avoid thinking about the history of the problem, that is, we think about the 'now'. The ritualisation of tasks is driven to control decision-making, to reduce emotional effort, and the avoidance of change and uncertainty (i.e., the unknown). Individual biases are important to the thinking process and should not be considered vulnerabilities. This perspective is developed by exploring biases as potential sources of epistemic injustice or identity bias (Dunsmore 2022).

Nursing emerges as an 'empirical event' within a kinematic context, where its significance is conveyed through the framework of experiences of real-life events. However, not everyone may readily embrace this interpretation or intuitive understanding possibly due to a lack of conceptual impairment. The panel concluded with an aspirational vision of collective liberation, envisioning participants as 'knowledge pirates' who skillfully interpret guidelines and rules while maintaining a critical mindset that transcends conventional boundaries. Uncertainty in healthcare often arises from the dynamic and complex nature of patient care, where guidelines and rules may not always provide clear-cut solutions. In such contexts, nurses must navigate uncertainty by critically interpreting it while maintaining a flexible mindset. This imaginative perspective emphasises the importance of thinking outside the box and

daring to challenge our reasoning towards the enhancement of nursing care and elevation of the standards of nursing research. This aspirational vision encourages nurses to embrace uncertainty as an opportunity for growth and innovation rather than as a barrier to progress.

3 | Conclusion

The key contributions of this paper lie in the endeavour of making significant or visible uncertainty in nurses' clinical reasoning. We discussed the critical aspect of uncertainty in clinical practice, emphasising the subjective nature of perception and the challenges of navigating uncertainty in healthcare settings. This exploration is exemplified by drawing on philosophical perspectives, including Protagoras' defence of perception, Berkeley's idealism which posits that reality is constructed through perception and cannot exist independently of it, Nietzsche's acknowledgement of the intertwining of facts and interpretations, and Schön's concept of 'epistemology of practice'. Additionally, attention is given to the importance of reflective practice in nursing, which involves making implicit structures explicit and critically evaluating one's behaviour to enhance skills. The discussion further delves into the epistemological challenges related to empirical reasoning, acknowledging the complexities in nursing interventions, subjective experiences of uncertainty, and the intricate dynamics of the care environment. The exploration encompasses philosophical perspectives from Kant, Hume, Coffa, and logical positivism, illustrating how these theories intersect with the challenges faced in nursing. We delved into the implications of post-humanism in healthcare, particularly the risks associated with the use of predictive healthcare algorithms and the importance of maintaining a critical awareness of traditional thought processes. Finally, we discussed that individual responses to uncertainty vary based on tolerance levels. The moral appropriateness of these responses lies in their positivity or logical consistency, as well as in their capacity to foster adaptability to encountered uncertainties. We emphasise constancy as a lived quality and demanding alignment of the mind with a comprehensive understanding of challenges.

Author Contributions

Lara Cunha: Conceptualisation (lead), Writing – Original Draft Preparation, Writing – review and editing (lead). **Filipa Ventura:** Formal Analysis, Writing – review and editing (equal). **Márcia Pestana-Santos:** Conceptualisation, Formal Analysis, Supervision (equal), writing – review and editing (equal). **Lurdes Lomba:** Conceptualisation, Supervision (equal), writing – review and editing (equal). **Margarida Reis Santos:** Conceptualisation, Supervision (lead), writing – review and editing (equal).

Conflicts of Interest

The authors have no conflicts of interest to report. CUNHA, L. – none. Ventura, F. – none. PESTANA-SANTOS, M. – none. LOMBA, L. – none. SANTOS, M. – none.

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Data Availability Statement

Data sharing not applicable to this article as no datasets were generated or analysed during the current study.

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Discussão

Os nove estudos que compõem esta tese articulam-se como diferentes prismas de uma mesma questão complexa: o RC dos enfermeiros em contextos marcados pela incerteza, como a UCPA. Cada investigação, com o seu desenho metodológico próprio, aprofunda dimensões distintas – teóricas, empíricas e epistemológicas – que, quando reunidas, compõem uma compreensão mais densa, situada e crítica do fenómeno. A progressão entre os estudos reflete um movimento integrador, que parte da revisão do conhecimento disponível, mergulha na experiência vivida dos profissionais, propõe instrumentos de avaliação e validação, e culmina na construção partilhada de estratégias de suporte à prática.

Nasce a necessidade de compreender a “revolução copernicana” no RC, um reposicionamento de perspectiva que nos convida a (re)considerar a incerteza como uma dimensão constitutiva da realidade dos cuidados de enfermagem pós-anestésicos. Assim, inaugura-se um novo olhar: a incerteza, longe de ser um vazio de conhecimento, revela-se como um campo de possibilidades, um espaço onde o raciocínio clínico se molda, se expande e se reinventa (Halpern, 2017). Curiosamente, no Manuscrito 1, a maioria dos artigos consultados não nomeia a incerteza. Será porque não se faz *per se* sentir? A ausência do termo ‘*uncertainty*’ não significa a ausência do fenómeno; pelo contrário, pode indicar a sua imersão absoluta na prática, a ponto de se tornar indistinta do próprio ato de raciocinar. Com o suporte do modelo MUCH-S, descobre-se que a incerteza é um atributo do cuidado de enfermagem em contextos clínicos complexos (Pomare et al., 2019b). Ao desvelar a incerteza, não a dissipamos, mas aprendemos a (re)conhecê-la. Se antes suponhamos o seu limite, agora emerge o horizonte das suas dimensões – pessoal, científica e prática.

A incerteza pessoal, enquanto sentimento de dúvida sobre si próprio ou sobre o mundo, pode motivar uma análise mais crítica das relações sociais (Reinhard et al., 2023). “A incerteza pode ser expressa numa textura complexa de comportamentos interativos, sintaxe, implicatórias e silêncios” (Gramling et al., 2021, p.2617). Nesse estado, os indivíduos tendem a abandonar heurísticas e a focar-se no conteúdo verbal, o que aumenta a precisão na deteção de vieses. Assim, a incerteza pode ter um papel construtivo na avaliação da comunicação e das interações sociais (Reinhard et al., 2023). Paralelamente, a incerteza científica tem sido destacada como um recurso valioso no processo de construção de sentido (Chen, 2022). Em particular, a incerteza epistémica, distribuída por quatro fases da modelação - problematização, prática material, prática argumentativa e conceptualização -, desempenha um papel fundamental ao estimular a formulação de questões, a reconstrução de modelos, a análise crítica e a explicação teórica. Dessa forma, em vez de apenas reproduzirem conhecimentos, os indivíduos tornam-se agentes ativos na construção do saber científico (Chen et al., 2024). Djulbegovic (2021, p. 2632) argumenta que “*resultados ótimos podem ser alcançados mesmo na ausência de certezas absolutas para a tomada de decisão*”. Para isso, é fundamental adotar uma “resposta racional” à incerteza na prática clínica, que também reconheça o papel das emoções e das heurísticas nos processos de RC. Esta abordagem exige ainda uma humildade intelectual profunda,

que não apenas aceite a inevitabilidade da incerteza, mas que também abra espaço para estratégias de gestão que vão além da simples inação (Djulgovic, 2021). Em última análise, a incerteza nas suas dimensões pessoal, científica e prática constituem um terreno fértil para o exercício da reflexão crítica e da humildade intelectual, desafiando-nos a abraçar o desconhecido como parte essencial do conhecimento e da ação responsável.

Revelam-se dez temas centrais que configuram a experiência da incerteza no raciocínio clínico do *ser-enfermeiro* em UCPA, vivida de forma complexa e inescapável, sendo não apenas um desafio contingente operacional, mas como uma condição intrínseca e estruturante da própria prática clínica. A ambiguidade impõe ao enfermeiro a suspensão da certeza, lançando-o num espaço liminar entre saber e não saber, onde a ação não se funda em garantias absolutas, mas em hipóteses prudenciais (Rocha & Cunha, 2024). A fragilidade comunicacional, por sua vez, revela a intersubjetividade como campo de vulnerabilidade, em que o sentido do cuidado se perde quando o diálogo se (co)rompe (White et al., 2022). A ética de trabalho, neste cenário, não se esgota na adesão a protocolos, mas emerge como fidelidade a um ideal de cuidado que resiste à automatização e exige discernimento moral perante a ambivalência das situações vividas (McTavish, 2025). A dificuldade em interpretar e antecipar resultados devolve ao enfermeiro a consciência da finitude epistémica; um convite à humildade cognitiva, através de um modo de raciocinar que transcende a lógica linear e exige flexibilidade interpretativa, prudência prática e abertura radical ao (des)conhecido (Bleicher, 2021; Gilbert, 2024). O compromisso do desempenho cognitivo, longe de ser uma falha individual, expõe os limites humanos sob um sistema que exige respostas imediatas e decisões infalíveis. A incivilidade revela a erosão do reconhecimento mútuo no espaço relacional do cuidado, onde o outro - par ou pessoa cuidada - torna-se cominação em vez de alteridade cooperante (Chris et al., 2022). A imprecisão quanto às competências essenciais desestabiliza a identidade profissional, criando zonas cinzentas onde o enfermeiro se vê dividido entre expectativas difusas e exigências concretas (McTavish, 2025). A tecnologia, por mais avançada, não dissolve a incerteza; ao contrário, pode amplificá-la, ao afastar o cuidado da dimensão existencial e tornando-o um ato técnico desvinculado da singularidade do outro (Ameye et al., 2023). A perceção de risco e (in)segurança, finalmente, é mais do que um dado objetivo: é uma vivência existencial de responsabilidade, em que cada decisão carrega o peso ético da possível consequência (Biricheva, 2020). O stress ocupacional, surge como manifestação de um mal-estar profundo perante a contradição entre a exigência de controlo e a realidade da indeterminação (Rocha & Cunha, 2024). Assim compreendida, a incerteza é um desafio existencial no limiar entre o conhecido e o incerto, entre a técnica e o mistério do outro, intrínseca ao próprio ato de cuidar.

A análise híbrida permitiu evidenciar os fatores que modulam a incerteza no raciocínio clínico, agrupando-os em categorias de barreiras e facilitadores. A intenção de agir, as atitudes, as normas subjetivas e as variáveis externas remetem para um modelo psicossocial de comportamento que, embora descritivo, pode ser reinterpretado

como expressão da tensão entre o sujeito moral e as estruturas institucionais (Edwards, 2014). A motivação para cumprir com expectativas normativas, por exemplo, confronta-se com as crenças pessoais sobre o valor e o impacto da ação clínica, o que exige do profissional um contínuo equilíbrio entre autonomia e responsabilidade coletiva (Crisham, 1981). A dimensão normativa das práticas - refletida nas crenças comportamentais e nas atitudes face à incerteza - sugere que a gestão da incerteza não é apenas técnica, mas também moral e intersubjetiva (Erman, 2006). Há uma ética implícita nas escolhas feitas sob incerteza, que exige não a eliminação do desconhecido, mas a sua integração responsável (Edwards, 2014).

Ressalvar as abordagens de suporte à decisão, que podem ser entendidas a partir de duas lógicas fundamentais: aquelas baseadas na concordância sobre pressupostos (*"agree-on-assumptions"*) que refletem um raciocínio transcendental, enquanto as que buscam concordância sobre decisões específicas (*"agree-on-decisions"*) evidenciam um raciocínio relacional (Lempert & Collins, 2007). Já Sen (2008) realça a deliberação como um processo relacional fundamental para a escolha social, onde a ética do debate se expressa através de critérios claros que avaliam a qualidade do processo de raciocínio. Tal deliberação torna-se mais efetiva ao reconhecer a inevitável coexistência de múltiplas visões divergentes, incentivar avaliações contínuas e iterativas, exigir a transparência no raciocínio e na lógica aplicada, e promover uma "imparcialidade aberta" que legitima e valoriza as perspectivas de todos os participantes, tanto aqueles diretamente envolvidos quanto os externos à comunidade impactada pela decisão (Sen, 2008). Em contextos complexos, como o da prática clínica, evidencia-se a necessidade de uma negociação ética e inclusiva, capaz de harmonizar a pluralidade de valores e níveis de TI.

As estratégias de gestão da incerteza desdobram-se em dimensões que ultrapassam o domínio técnico e inscrevem-se numa abordagem compreensiva do cuidado. Estratégias centradas na pessoa (como a autorregulação emocional e a reformulação cognitiva positiva) demonstram a necessidade de um cuidado que também se volta para o cuidador (Larsson et al., 2016). O cultivo da autorreflexão, o suporte da equipa, e o uso de simulação e formação contínua revelam um compromisso com a excelência, mas também com a humildade epistémica - um reconhecimento de que a incerteza é uma constante no cuidar, não uma falha a ser eliminada (Potter, 2022). No espaço da incerteza, a técnica e a ciência dão lugar à arte do cuidar, em que a escuta, a presença e a prudência se tornam virtudes clínicas (Boudreau et al., 2024). Como tal, a gestão da incerteza não se reduz à implementação de protocolos, mas requer uma verdadeira "ética do cuidado", orientada pela compreensão do outro em situação de vulnerabilidade (Darsaut & Raymond, 2021). A TI revela-se um conceito transversal e fundamental neste contexto, compreendida como uma disposição fundamental perante o enigma do real - uma forma de habitar o desconhecido sem tentar anulá-lo (Hillen et al., 2017). A TI expressa o modo como o sujeito se relaciona com os limites do saber, acolhendo a ambiguidade como parte constitutiva da existência e do cuidado (Hillen et al., 2017). Ao longo do tempo, tem sido pensada como uma

configuração estável da subjetividade, refletida nas diversas formas - emocionais, cognitivas e comportamentais - pelas quais resistimos ou nos abrimos à incerteza (Patel et al., 2022). Tolerar, aqui, é mais do que suportar. É reconhecer no *não saber* uma dimensão inevitável da vida e do encontro clínico (Ilgen et al., 2022).

A TI emerge como uma competência essencial dos profissionais de saúde contemporâneos. Trata-se não apenas de suportar o não saber, mas de habitar o incerto com responsabilidade, abertura e discernimento (Reis-Dennis et al., 2021). Ainda assim, apesar do crescente reconhecimento institucional, as estratégias pedagógicas para cultivá-la permanecem pouco desenvolvidas. O uso do questionamento provocativo, a antecipação da incerteza futura como parte do processo de aprendizagem, e a exposição deliberada dos profissionais em formação a situações e realidades desconhecidas, são caminhos pedagógicos a destacar (Lazarus et al., 2025). No fim, cultivar a TI é um gesto profundamente ético: é preparar os profissionais não para controlar todas as variáveis, mas para agir com sabedoria onde o controlo não é possível - tal como acontece, quase sempre, na prática clínica (Jenkins et al., 2019).

A construção e validação do PaNSCT® surge como gesto metodológico coerente com a visão ampliada do conhecimento. O instrumento não se limita a quantificar a competência processual, mas procura captar a forma como o pensamento clínico se organiza e se ajusta perante a incompletude e a ambiguidade que caracterizam a prática real. Neste sentido, a avaliação do RC sob incerteza torna-se, simultaneamente, um exercício de medição e de revelação: revela-se que a maturidade clínica não reside apenas no domínio técnico, mas na capacidade de habitar a dúvida com discernimento, abertura e responsabilidade (Djulgovic, 2021). Neste sentido, a incerteza não é apenas uma condição operacional, mas uma expressão da própria consciência em ação – da consciência enquanto dúvida, como propõe Yarrow (1984). A consciência não emerge da *certeza*, mas do confronto com o que é instável, incompleto, contraditório. É precisamente nesse espaço entre o saber e o não saber que se dá o movimento genuíno do RC: não como algoritmo, mas como tensão interpretativa (Yarrow, 1984). A correlação entre melhor desempenho e maior experiência específica sugere que a incerteza, longe de ser eliminada com o tempo, transforma-se – passando de ameaça a aliada reflexiva. Assim, o PaNSCT® encarna aquilo que este manuscrito defende: que a incerteza não é um obstáculo à racionalidade, mas parte constituinte de um raciocínio ético, sensível e situado (Djulgovic, 2021). Em última análise, este instrumento devolve ao enfermeiro o espelho da sua própria consciência clínica, desafiando-o a repensar o saber não como certeza, mas como escuta ativa do real – sempre inacabado (McTavish, 2025).

Após compreender como o RC se posiciona perante a ambiguidade e a incerteza, delineia-se a base conceptual e metodológica que fundamenta a revisão *scoping* subsequente. É realizada uma análise das estratégias utilizadas por enfermeiros no RC à cabeceira do doente, distinguindo-as entre abordagens normativas e reflexivas. As estratégias normativas - tais como protocolos clínicos, algoritmos, listas de verifi-

cação e sistemas informatizados de apoio à decisão - visam garantir uniformidade e reduzir a variabilidade nas decisões clínicas, promovendo uma racionalidade técnica e previsível. Já as estratégias reflexivas - como a autorreflexão guiada, o pensamento em voz alta, a mentoria, a escrita de narrativas experienciais - valorizam o raciocínio individual e a consciência crítica do enfermeiro. Nesse contraste, delineia-se uma tensão filosófica fundamental: entre uma racionalidade instrumental, que privilegia a eficácia e a reprodutibilidade, e uma racionalidade prática, que reconhece a natureza contingente, interpretativa e dialogal do cuidado em saúde (Tsai, 2020). Esta dualidade remete à distinção entre *techne* e *phronesis*: o saber técnico *versus* a sabedoria prática (Hofmann, 2003; Nussbaum, 2001). Enquanto as estratégias normativas se aproximam da *techne*, concebida como um conhecimento sistemático e transmissível, as estratégias reflexivas ancoram-se na *phronesis*, entendida como uma virtude ética que se manifesta na capacidade de *deliberar bem* perante a singularidade das situações (Phillips & Hall, 2013). Assim, o RC transcende a mera atividade cognitiva para se afirmar como uma prática profundamente existencial, que exige do enfermeiro não apenas competência técnica, mas também sensibilidade ética, sentido de responsabilidade e um compromisso constante com a reflexão crítica sobre o próprio agir.

Dando continuidade à reflexão anterior, analisa-se, à luz da experiência dos peritos em enfermagem perioperatória, a pertinência e viabilidade contextual das estratégias destinadas a sustentar o RC à cabeceira do doente no ambiente particular e exigente da UCPA. O valor singular deste estudo reside na sua insistência na prática situada do RC – não como um exercício meramente técnico ou cognitivo, mas como uma forma de pensamento ecológico, predicado e sensível às contingências do encontro clínico (Bredo, 1994). Bates and Ellaway (2016) destacam essa compreensão ao propor uma visão estratificada do contexto, que abrange desde a materialidade física e organizacional até às dimensões imateriais, como a prática situada, as experiências subjetivas dos envolvidos e as influências culturais que atravessam e moldam os encontros clínicos. Essa abordagem plural reconhece o contexto não apenas como cenário, mas como coautor do RC (Bates & Ellaway, 2016). A avaliação realizada pelos peritos transcende critérios genéricos de eficácia pedagógica, voltando-se à adequação concreta das estratégias às dinâmicas, ritmos e vulnerabilidades próprios do contexto pós-anestésico. Nesse sentido, o estudo propõe não apenas um mapeamento técnico de intervenções possíveis, mas uma proposta ética e epistemológica: formar profissionais que saibam pensar e decidir com os pés assentes na realidade concreta do cuidado – com suas urgências, limitações e possibilidades singulares (Olson et al., 2024).

A incerteza é desvelada como a força gravitacional que sustenta o próprio campo do RC, não como falha, mas como origem de consciência e da prática reflexiva. A percepção da incerteza inaugura o pensamento clínico genuíno, pois só quando o enfermeiro reconhece — com lucidez e humildade — que *não sabe*, torna-se possível pensar *dentro* da complexidade (“*thinking in*”) e agir *como se* soubesse o suficiente para cuidar (“*acting as if*”). Esta tolerância ativa à incerteza não é resignação, mas um compromisso ético com o inacabado, com o provisório (Ilgen et al., 2022). Destaca-se

a centralidade da “tomada de consciência” da incerteza como um elemento essencial na prática clínica, que realça a subjetividade da percepção e a forma como esta constrói a realidade. A prática clínica surge como um processo interpretativo, no qual a realidade é continuamente (re)construída a partir das percepções subjetivas, tornando a incerteza um componente inevitável e até necessário para o desenvolvimento do conhecimento e da ação cuidada (Shaffer & Hendrick, 1974). A inseparabilidade entre factos e interpretações desafia os profissionais a desenvolverem uma postura constante de autoavaliação e reflexão crítica, reconhecendo que o conhecimento é sempre parcial, provisório e situado (Simandan, 2019). Esta lente não evidencia apenas as limitações do empirismo estrito, mas ressalta a necessidade de uma avaliação ética das respostas individuais à incerteza, fundamentada na coerência lógica e na flexibilidade adaptativa (Bleicher, 2021). Paralelamente, os desafios éticos e epistemológicos colocados pelo pós-humanismo – em especial pelo uso crescente de algoritmos preditivos – podem ameaçar a singularidade e a complexidade intrínsecas à experiência clínica (Ameye et al., 2023).

Conclusões

A prática do cuidado de enfermagem é, em essência, uma travessia no/do desconhecido. Na UCPA, essa travessia adquire contornos particularmente agudos: o tempo é limitado, os dados clínicos são frequentemente incompletos, e as decisões precisam ser tomadas no fio da urgência. Neste contexto de elevada complexidade, o RC dos enfermeiros revela-se não apenas como competência técnica, mas como exercício de presença perante a incerteza. A incerteza associada aos cuidados de saúde, aqui, não é uma falha do conhecimento ou um obstáculo a ser simplesmente removido pela técnica - é uma dimensão constitutiva da experiência do cuidado. É manifesta em múltiplas formas: ambiguidade diagnóstica, imprevisibilidade prognóstica, tensões éticas, (in)segurança organizacional, e até mesmo no silêncio incômodo entre um alarme tecnológico e a expressão de dor da pessoa cuidada. Cada uma dessas expressões convoca o enfermeiro à análise mais profunda do próprio processo de raciocínio que sustenta as suas ações. Reconhecer a incerteza nas suas dimensões pessoal, científica e prática é assumir a condição finita e incompleta do conhecimento humano, especialmente na complexidade dos cuidados pós-anestésicos.

As experiências vividas de incerteza, narradas por enfermeiros da UCPA, revelam um campo de complexidade que ultrapassa as competências técnicas. Foram dez os temas centrais que moldam o RC sob incerteza: a ambiguidade e a latitude nas decisões; as limitações na comunicação interprofissional; o conflito entre a ética de trabalho e a exaustão emocional; a dificuldade em interpretar e prever resultados; a deterioração do desempenho cognitivo sob pressão; a incivilidade no ambiente institucional; a indefinição em torno das competências nucleares do enfermeiro pós-anestésico; a hiper exposição à tecnologia de ponta; a sensação de (in)segurança e risco e o stress ocupacional. Contrariamente à expectativa de que a tecnologia e a inteligência artificial reduziriam a incerteza, o uso intensivo pode exacerbar a sensação de alienação e fragilidade, deslocando o foco do cuidado centrado na presença humana para a precisão algorítmica. Este cenário gera um contexto de vulnerabilidade epistêmica, no qual o não saber – longe de ser uma falha – deve ser reconhecido como parte constitutiva do cuidar. Tornar essa incerteza tangível e explícita permite aos enfermeiros preparem-se para respostas adaptativas, mais conscientes e resilientes, alinhadas com a complexidade da prática clínica e com o imperativo da segurança da pessoa cuidada.

Torna-se assim, essencial identificar os moderadores da incerteza – fatores que amplificam ou atenuam a vivência da incerteza no RC. Estes moderadores englobam múltiplas dimensões, incluindo a formação prévia e contínua dos profissionais, a experiência acumulada em contextos clínicos complexos, a cultura organizacional dominante, o suporte socioemocional oferecido pelas equipas multidisciplinares e os próprios traços individuais, como a disposição para refletir, a abertura à ambiguidade e a resiliência à instabilidade. A interação entre esses fatores configura não apenas a qualidade do RC, mas também influencia profundamente o bem-estar emocional e psicológico do enfermeiro. Em ambientes de elevada contingência, como o pós-anestésico, a ausência de moderadores positivos pode conduzir a níveis significativos de

ansiedade ou *burnout*, comprometendo não só a segurança da pessoa em situação perioperatória, mas também a confiança do enfermeiro na sua própria capacidade de agir. Por outro lado, quando adequadamente reconhecidos e promovidos, esses moderadores funcionam como alavancas para a construção de práticas mais reflexivas, colaborativas e seguras, tornando-se elementos-chave no desenho de intervenções formativas e organizacionais que favoreçam a gestão ética, competente e humanizada da incerteza clínica.

Responder à incerteza exige, portanto, estratégias conscientes e sistemáticas de tolerância – não como uma postura passiva pelo desconhecido, mas como uma competência ativa e cultivável. No contexto clínico da UCPA, os enfermeiros mobilizam um conjunto diverso de estratégias que podem ser agrupadas em quatro grandes categorias: estratégias focadas na ignorância (como o reconhecimento de limites do conhecimento), na incerteza em si (incluindo análise crítica e pensamento reflexivo), na resposta ao cenário clínico (como planos de contingência e protocolos flexíveis), e na pessoa (como autorregulação emocional e suporte interpessoal). Essas estratégias distribuem-se por múltiplos domínios do cuidado, abrangendo desde o foco no destinatário do cuidado (centrado na pessoa), competências técnicas e cognitivas (pensamento crítico, simulação e capacitação pós-graduada), até dimensões organizacionais e relacionais (condições de trabalho, comunicação colaborativa, formação em serviço e projetos de melhoria contínua). A prática da autorreflexão, o treino da inteligência emocional, as discussões clínicas interdisciplinares e a procura ativa por apoio junto a pares experientes, destacam-se como meios robustos para integrar o não saber de forma ética, segura e produtiva ao RC. Tolerar a incerteza torna-se, assim, uma virtude clínica – não como renúncia ao rigor, mas como abertura consciente à complexidade das realidades de enfermagem, promovendo o bem-estar dos profissionais e ampliando a segurança e qualidade dos cuidados prestados.

No plano metodológico, avaliar a incerteza no RC implica reconhecer que essa experiência não é apenas técnica ou cognitiva, mas profundamente subjetiva, relacional e situada. A incerteza emerge do encontro entre o saber profissional e a complexidade viva do cuidado - feita de dados incompletos, sinais ambíguos e decisões urgentes. Outrossim, torna-se necessário adotar instrumentos que captem não apenas o conhecimento declarado, mas a forma como ele é mobilizado sob ambiguidade e risco. Foi com esse propósito que se desenvolveu e validou o PaNSCT®, para avaliar o RC sob incerteza dos enfermeiros da UCPA. Baseado na TS, o PaNSCT® explora o RC contextualizado através de casos clínicos que simulam dilemas reais, que exigem do enfermeiro uma resposta ponderada perante a incompletude. Os resultados indicaram forte confiabilidade ($\alpha = 0,92$), validade de constructo e sensibilidade discriminatória entre especialistas e enfermeiros. Observou-se ainda uma correlação positiva entre a pontuação e a experiência específica pós-anestésica, o que sugere que o raciocínio sob incerteza se aprimora com a exposição prática e o acúmulo da vivência clínica. Ao mesmo tempo, os

dados qualitativos ressaltaram que gerir a incerteza requer mais do que conhecimento técnico: exige autorregulação emocional, abertura à dúvida e prudência interpretativa. Nesse sentido, instrumentos como o PaNSCT® não avaliam apenas a competência clínica, mas oferecem uma oportunidade formativa - um espelho para o pensamento em ação, onde o saber encontra os limites e, ao reconhecê-los, pode realinhar-se.

Esta investigação ultrapassa a mera aplicação técnica de estratégias de suporte ao RC, revelando-o como um processo dialético, imerso na incerteza, na ambiguidade e na singularidade de cada situação clínica. Destacam-se, nesse cenário, as estratégias reflexivas e normativas como pilares fundamentais para a otimização do RC. As estratégias reflexivas convidam à tomada de consciência crítica das próprias práticas, no desvelo de pressupostos implícitos, a ampliação da capacidade do enfermeiro para aprender com a experiência e responder criativamente - e eticamente - à incerteza que permeia o cuidado. Por outro lado, as estratégias normativas, que se manifestam em protocolos, nos instrumentos estruturados e nas diretrizes clínicas, oferecem um horizonte de segurança e coerência, que asseguram a qualidade e a responsabilidade partilhada do cuidado. É nessa convergência entre o reflexivo e o normativo que reside o equilíbrio dinâmico necessário: enquanto a reflexão impulsiona a adaptação e a personalização do cuidado, respeitando a singularidade da experiência clínica e as necessidades específicas da pessoa cuidada, a normatividade sustenta o RC numa base confiável e partilhada da PBE.

A validação das estratégias de suporte ao RC assenta num princípio fundamental: o reconhecimento do saber experiencial dos peritos como elemento estruturante da prática informada. Ao envolver especialistas com vivência direta nos contextos de cuidados pós-anestésicos, foi possível não apenas validar teoricamente as estratégias, mas sobretudo contextualizá-las, alinhando-as com os dilemas éticos, operacionais e relacionais vividos à cabeceira do doente. O consenso obtido reforça a legitimidade destas estratégias, não como soluções universais, mas como recursos situados - profundamente enraizados na realidade complexa e imprevisível da prática clínica. Esta revisão com validação *in situ* poderá, assim, servir de base para o desenvolvimento de materiais pedagógicos, programas formativos e políticas institucionais que promovam o RC como competência viva: cultivar a responsabilidade de raciocinar da melhor forma possível - mesmo (e sobretudo) quando a *certeza* nos é negada.

A incerteza no RC em enfermagem é, em essência, reconhecer que o ato de cuidar está enraizado na constante negociação entre o conhecido e o indeterminado. Longe de ser uma falha ou fragilidade, a incerteza emerge como uma condição ontológica da prática clínica – atravessada por percepções subjetivas, contingências contextuais, limites epistêmicos e dinâmicas afetivas. Perceber, interpretar e agir são movimentos inseparáveis da consciência clínica, mobilizados num campo em que o sentido se constrói a partir da experiência, da linguagem e da metafísica. Oferece-se não apenas uma lente crítica, mas uma ética do cuidado que valoriza a constância sem negar o medo, a ação informada sem aprisionar-se ao determinismo, a diretriz sem sufocar

a singularidade. Estratégias como a análise semiótica, a valorização da experiência sensível, a utilização reflexiva de *guidelines* e o reconhecimento das dimensões éticas e existenciais do cuidado permitem aos enfermeiros não apenas tolerar, mas habitar a incerteza com lucidez e coragem. Ao acolher a incerteza como parte constitutiva da prática – e não como obstáculo a ser eliminado – a enfermagem reposiciona-se como um campo de saber que alia ciência, humanidade e sabedoria prática na resposta a situações sempre únicas, sempre inacabadas.

A gestão da incerteza nos cuidados pós-anestésicos transcende a simples aplicação rígida de protocolos ou diretrizes clínicas. Revela-se como uma ética da atenção situada, que requer uma escuta ampliada – não apenas dos sinais objetivos da pessoa em situação perioperatória, mas também das nuances subjetivas, contextuais e emocionais. Essa prática implica uma postura crítica e reflexiva constante, onde o discernimento clínico vai além da técnica e torna-se um ato consciente de equilíbrio entre conhecimento, *phronesis* e adaptação ao inesperado. Reconhecer a incerteza como uma condição inerente ao cuidado humano é fundamental para formar profissionais capazes de acolher essa realidade sem medo ou negação, desenvolvendo uma tolerância ativa e responsável. Envolve cultivar sensibilidade para os sinais imperceptíveis, coragem para agir perante o desconhecido e resiliência para aprender com os desafios. Dessa forma, preparar enfermeiros que saibam habitar a incerteza significa investir numa educação que valorize tanto a competência técnica quanto a inteligência emocional, a comunicação empática e a ética do cuidado, promovendo uma prática mais humana, segura e contextualizada.

Como em qualquer trabalho científico, esta tese apresenta algumas limitações que merecem ser reconhecidas. Em primeiro lugar, a complexidade conceptual envolvida na articulação entre RC e incerteza pode ter restringido a operacionalização de alguns constructos em termos empíricos. Além disso, a amostra utilizada, embora pertencente ao contexto estudado, não permite uma generalização ampla dos resultados para outras realidades clínicas ou culturais. A utilização do PaNSCT® como instrumento principal, apesar da validade demonstrada, pode beneficiar-se de versões ampliadas e mais diversificadas no futuro. Outra limitação refere-se à natureza transversal de parte da análise, que não permite observar longitudinalmente o desenvolvimento das competências clínicas de RC em cenários de incerteza. Como propostas de melhoria, sugere-se a incorporação de metodologias mistas nos estudos futuros, que combinem a avaliação quantitativa com narrativas e diários reflexivos dos profissionais. Também se recomenda o estabelecimento de parcerias interdisciplinares e o uso de tecnologias digitais que potencializem a simulação de cenários incertos. Ademais, ampliar os contextos de aplicação do teste, diversificando os cenários clínicos e os perfis profissionais envolvidos, torna-se particularmente interessante e apelativo.

No âmbito da formação dos profissionais de saúde, esta tese evidencia a urgência de se incluir, de forma sistemática e crítica, o debate sobre a incerteza nos currículos de enfermagem. Gerir a incerteza exige mais do que só conhecimento técnico:

requer pensamento crítico, flexibilidade cognitiva, autorreflexão e competências emocionais. É fundamental que os programas de formação incentivem práticas reflexivas, simulações clínicas em contextos ambíguos e discussões interprofissionais que preparem os profissionais para agir, mesmo quando a certeza é inalcançável.

Esta tese destina-se a um público diversificado – estudantes, enfermeiros, docentes, investigadores e decisores – que procuram compreender e enfrentar os desafios do RC sob incerteza, particularmente em contextos de elevada complexidade como os de cuidados pós-anestésicos. De forma integrada, oferece orientações para a seleção criteriosa de ferramentas e estratégias metodológicas para a sua implementação contextualizada. Ao articular teoria, prática e experiência vivida, a investigação apresenta uma síntese inovadora de um vasto corpo de conhecimento sobre a gestão da incerteza, indo para além dos modelos tradicionais ao incorporar a análise de atores, redes de decisão, temporalidades clínicas e dinâmicas organizacionais. Reconhece-se, assim, que raciocinar não se resume à aplicação de algoritmos ou teorias pré-estabelecidas, mas exige sensibilidade epistemológica, ética e relacional – competências que devem ser cultivadas desde a formação inicial até ao desenvolvimento profissional contínuo. Neste sentido, a tese sublinha a importância de promover práticas reflexivas e ambientes de aprendizagem que favoreçam a construção de um pensamento clínico crítico, adaptativo e tolerante à incerteza, contribuindo não só para a melhoria do cuidado, mas também para a autonomia e desenvolvimento contínuo dos enfermeiros.

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Anexos

ANEXO I

Guião de Entrevista Semiestruturada

GUIÃO DA ENTREVISTA SEMI-ESTRUTURADA - A incerteza no raciocínio clínico dos enfermeiros da Unidade de Cuidados Pós-anestésicos

CÓDIGO PARTICIPANTE				INVESTIGADOR				
DATA ENTREVISTA			INÍCIO ENTREVISTA			FINAL ENTREVISTA		
IDADE PARTICIPANTE	_____ anos			GÉNERO PARTICIPANTE	feminino masculino não especificado			
CATEGORIA PROFISSIONAL	enfermeiro especialista gestor			GRAU ACADÉMICO	licenciatura mestrado doutoramento			
EXPERIÊNCIA PROFISSIONAL	_____ anos			EXPERIÊNCIA UCPA	_____ anos			
PROTOCOLO SUMÁRIO DA ENTREVISTA								
Título da investigação e identificação do investigador principal. Garantia de possibilidade de desistência do estudo a qualquer momento e sem justificação. Garantia de confidencialidade dos dados e de que a participação na investigação não implica qualquer risco acrescido para o participante. Operacionalização do Consentimento Informado. De briefing da entrevista e validação dos dados colhidos. Contato do investigador principal.								
QUESTÕES				SUBQUESTÕES				
1. O que é para si incerteza?								
2. Qual a sua percepção de incerteza relacionada com o raciocínio clínico dos enfermeiros da Unidade de Cuidados Pós-Anestésicos?								
3. Em que situações da prática clínica ocorre (ou pode ocorrer) incerteza no raciocínio clínico dos enfermeiros da Unidade de Cuidados Pós-Anestésicos?								
4. Pensando na sua experiência pessoal e no conhecimento que tem do trabalho em Unidade de Cuidados Pós-Anestésicos, como considera que é vivenciada a experiência de incerteza no raciocínio clínico dos enfermeiros da Unidade de Cuidados Pós-Anestésicos?								
5. Que efeitos considera que a incerteza no raciocínio clínico pode ter nos enfermeiros da Unidade de Cuidados Pós-Anestésicos?				a) Considera que é um evento irrelevante, stressante ou benigno? b) Considera que é um evento prejudicial, ameaçador ou desafiante?				
6. Quais são os seus pensamentos e sentimentos quando vivencia a incerteza no raciocínio clínico de enfermagem?				a) Descreva os principais desafios cognitivos, emocionais e comportamentais.				
7. Descreva uma experiência clínica de um cenário/situação de incerteza, onde sentiu que fez a diferença.				a) Quais as informações/dados que usou para tomar decisões? b) Como orientou o raciocínio clínico de enfermagem?				
8. Quando vivenciou situações de incerteza, como tentou resolver o problema?				a) Como identificou possíveis soluções? b) Qual foi o resultado dessa escolha?				

	c) Refletindo sobre a situação, considera que existiriam estratégias alternativas? d) Acha que essas estratégias alternativas poderiam ter alterado o resultado da situação? De que forma?
9. Que recursos conhece e usa para gerir a incerteza no raciocínio clínico de enfermagem? Descreva-me como usa esses recursos.	
10. Há mais algum aspeto que considere relevante para clarificar o processo de gestão da incerteza no raciocínio clínico dos enfermeiros da Unidade de Cuidados Pós-Anestésicos?	

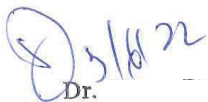
COMENTÁRIOS Provide any additional comments to support your assessment and recommendation.

APTO PARA ANÁLISE DE CONTEÚDO	sim não	NECESSITA DE CLARIFICAÇÕES	sim não

Obrigada(o) pela participação.

ANEXO II

Parecer CE Estudo Manuscrito 2, 3 e 4

 Dr. Diretor Clínico - EPE		Comissão de Ética para a Saúde	
		Exmo. Senhor Dr. Dign ^o Diretor Clínico do	
SUA REFERÊNCIA	SUA COMUNICAÇÃO DE	NOSSA REFERÊNCIA	DATA
		N.º 260/CES	02-06-2022
		Proc.Nº OBS.SF.077-2022	
PI OBS.SF.077-2022 "A incerteza no raciocínio clínico dos enfermeiros da Unidade de Cuidados Pós-Anestésicos." Entrada na UID: 12-04-2022 Entrada na CES: 14-04-2022 Investigador/a/es: Lara Daniela Matos Cunha – Enfermeira Coordenador/a/es: Co-Investigador/a/es: Margarida Reis Santos, Maria de Lurdes Lopes de Freitas Lomba, Márcia Pestana-Santos Promotor: Lara Daniela Matos Cunha Serviço de Realização: Unidade de Cuidados Pós-Anestésicos do Bloco Operatório Central do EPE - pólo Serviço de Anestesiologia.			
Cumprе informar Vossa Ex.^a que a CES - Comissão de Ética para a Saúde do , reunida em 18 de Maio de 2022, após reapreciação do projeto de investigação supra identificado, emitiu o seguinte parecer: <i>"A Comissão considera que se encontram respeitados os requisitos éticos adequados à realização do estudo, pelo que emite parecer favorável ao seu desenvolvimento no</i> Mais informa que a CES do deverá ser semestralmente atualizada em relação ao desenvolvimento dos estudos favoravelmente analisados e informada da data da conclusão dos mesmos, que deverá ser acompanhada de relatório final.			
Com os melhores cumprimentos			
A Comissão de Ética para a Saúde do			
 Presidente			

ANEXO III

Formulário Consentimento Informado e Esclarecido Estudos Manuscrito 2, 3 e 4

	INFORMAÇÃO AO PARTICIPANTE E FORMULÁRIO DE CONSENTIMENTO INFORMADO	IM-02.01 Próxima Revisão: Junho/2023
Comissão de Ética para a Saúde		Página 1 de 6

TÍTULO DO PROJETO DE INVESTIGAÇÃO:

A incerteza no raciocínio clínico dos enfermeiros da Unidade de Cuidados Pós-Anestésicos.

PROMOTOR:

Lara Daniela Matos Cunha - integrada no Programa de Doutoramento em Ciências de Enfermagem do Instituto de Ciências Biomédicas Abel Salazar (Universidade do Porto)

INVESTIGADOR COORDENADOR:

Lara Daniela Matos Cunha

CENTRO DE ESTUDO CLÍNICO:

Serviço de Anestesiologia

INVESTIGADOR:

Lara Daniela Matos Cunha

MORADA:

Serviço de Anestesiologia, Unidade de Cuidados Pós-anestésicos,

e

CONTACTO TELEFÓNICO:

964727944

NOME DO PARTICIPANTE:

É convidado(a) a participar voluntariamente neste estudo como participante porque é enfermeiro que presta cuidados na Unidade de Cuidados Pós Anestésicos, caso manifeste interesse em participar.

As informações que se seguem destinam-se a esclarecê-lo acerca da natureza, alcance, consequências e risco do estudo, de modo a permitir que, depois de esclarecido, se encontre capaz de decidir participar, ou não, neste estudo.

Caso não tenha qualquer dúvida acerca do mesmo, deverá tomar a decisão de participar ou não. Se não quiser participar não sofrerá qualquer tipo de penalização. Caso queira participar, ser-lhe-á solicitado que assine e date este formulário.

Após a sua assinatura e a do Investigador, ser-lhe-á entregue uma cópia, que deve guardar.

	INFORMAÇÃO AO PARTICIPANTE E FORMULÁRIO DE CONSENTIMENTO INFORMADO	IM-02.01 Próxima Revisão: Junho/2023
Comissão de Ética para a Saúde		Página 2 de 6

1. INFORMAÇÃO GERAL E OBJETIVOS DO ESTUDO

Este estudo irá decorrer no Serviço de Anestesiologia, na Unidade de Cuidados Pós-anestésicos do Bloco Operatório Central do e - pólo de e tem por objetivos: a) explorar as dimensões da incerteza no raciocínio clínico dos enfermeiros de uma Unidade de Cuidados Pós-Anestésicos, b) descrever e analisar as experiências de incerteza no raciocínio clínico dos enfermeiros de uma Unidade de Cuidados Pós-Anestésicos, c) descrever e analisar os efeitos da incerteza no raciocínio clínico dos enfermeiros de uma Unidade de Cuidados Pós-Anestésicos, d) descrever e analisar as estratégias de coping utilizadas para gerir a incerteza no raciocínio clínico dos enfermeiros de uma Unidade de Cuidados Pós-Anestésicos.

Trata-se de um estudo exploratório descritivo, paradigma qualitativo. Estudo clínico sem intervenção.

O estudo foi aprovado pela Comissão de , de modo a garantir a proteção dos direitos, segurança e bem-estar de todos os participantes incluídos e garantir prova pública dessa proteção.

Sugere-se a consulta das definições constantes do artigo 2.o da Lei n.o 21/2014, de 16 de abril, que aprovou a Lei de Investigação Clínica, denominada de LIC.

2. PLANO E METODOLOGIA DO ESTUDO

Este estudo académico é integrado no Programa de Doutoramento em Ciências de Enfermagem do Instituto de Ciências Biomédicas Abel Salazar - Universidade do Porto. Os critérios de inclusão na amostra são: enfermeiros da Unidade de Cuidados Pós Anestésicos, que manifestem interesse em participar no estudo. A técnica de amostragem será através de amostra não probabilística (por conveniência). O recrutamento de participantes que cumpram os critérios de inclusão, será efetuado através de minuta informativa acerca do tipo de estudo, objetivos, método utilizado e este deverá ser entregue presencialmente e/ou via email.

Este estudo exploratório descritivo de paradigma qualitativo, pretende colher dados através de entrevistas semi-estruturadas (prevê-se uma entrevista por participante mas poderá ter que se realizar uma segunda entrevista para clarificar o conteúdo). Serão colhidos dados demográficos (idade, género) e dados profissionais: anos de prática clínica, experiência clínica em ambiente clínico pós-anestésico (anos), escolaridade, grau académico, categoria profissional.

Resumidamente o plano de estudo será:

- 1) seleção dos participantes baseado no cumprimento dos critérios de inclusão;
- 2) assinatura do consentimento informado;
- 3) colheita de dados através de entrevista semi-estruturada;
- 4) análise de conteúdo das entrevistas e tratamento de dados com recurso ao software MAXQDA.

Duração do estudo - aproximadamente 6 meses. Data previsível de início em maio de 2022 e a data previsível da sua conclusão em novembro de 2022.

3. PROTEÇÃO DE DADOS DOS PARTICIPANTES

3.1 Responsável pelos dados

Investigador principal (Lara Daniela Matos Cunha)

	INFORMAÇÃO AO PARTICIPANTE E FORMULÁRIO DE CONSENTIMENTO INFORMADO	IM-02.01 Próxima Revisão: Junho/2023
Comissão de Ética para a Saúde		Página 3 de 6

3.2 Recolha de dados

Guião de entrevista semi-estruturada; gravação em áudio.

3.3 Categorias de dados

Análise de conteúdo das entrevistas e elaboração de categorias.

3.4 Tratamento de dados

Utilização do software MAXQDA.

3.5 Medidas de proteção adotadas

Todos os dados serão guardados em pasta protegida, com palavra de acesso, à qual apenas o investigador principal terá acesso.

3.6 Prazo de conservação dos dados

Conservação de dados de cinco (5) anos civis após o tratamento de dados.

3.7 Informação em caso de publicação

Serão utilizados códigos para identificação dos excertos extraídos das entrevistas de forma a proteger a identificação dos participantes e assegurar o anonimato ao longo de todo o processo.

4. RISCOS E POTENCIAIS INCONVENIENTES PARA O PARTICIPANTE

Não se prevê a ocorrência de riscos e/ou potenciais inconvenientes para os participantes.

5. POTENCIAIS BENEFÍCIOS

Não são previsíveis benefícios imediatos advindos da participação no estudo. Em última instância, o contributo será a produção de evidência científica que contribua para a compreensão da incerteza no raciocínio clínico de enfermagem dos enfermeiros de uma UCPA.

6. NOVAS INFORMAÇÕES

Caso se verifique qualquer alteração na finalidade do estudo, seja por alargamento da finalidade inicial, seja pela prossecução de novas e diferentes finalidades, irá proceder-se à recolha de novo consentimento, junto do participante, de modo a contemplar a alteração às finalidades inicialmente propostas.

7. RESPONSABILIDADE CIVIL

Não aplicável.

	INFORMAÇÃO AO PARTICIPANTE E FORMULÁRIO DE CONSENTIMENTO INFORMADO	IM-02.01 Próxima Revisão: Junho/2023
Comissão de Ética para a Saúde		Página 4 de 6

8. PARTICIPAÇÃO / RETIRADA DO CONSENTIMENTO

É inteiramente livre de aceitar ou recusar participar neste estudo. Pode retirar o seu consentimento em qualquer altura, através da notificação ao investigador, sem qualquer consequência, sem precisar de explicar as razões, sem qualquer penalização ou perda de benefícios e sem comprometer a sua relação com o investigador que lhe propõe a participação neste estudo.

O consentimento entretanto retirado não abrange os dados recolhidos e tratados até a essa data.

O investigador do estudo pode decidir terminar a sua participação neste estudo se entender que não é do melhor interesse continuar nele. A sua participação pode também terminar se o plano do estudo não estiver a ser cumprido. O investigador notificará-lo-á se surgir uma dessas circunstâncias.

9. CONFIDENCIALIDADE

Será garantido o respeito pelo direito do participante à sua privacidade e à proteção dos seus dados pessoais; devendo ainda ser assegurado que será cumprido o dever de sigilo e de confidencialidade a que se encontra vinculado, conforme disposto no artigo 29.º da Lei n.º 58/2019, de 08/08.

10 – DIREITO DE ACESSO E RETIFICAÇÃO

Pode exercer o direito de acesso, retificação e oposição ao tratamento dos seus dados. Contudo, este direito pode ser sujeito a limitações, de acordo com a Lei.

11. REEMBOLSO E/OU RESSARCIMENTO DO PARTICIPANTE

Este estudo é da iniciativa do investigador e, por isso, solicita-se a sua participação sem qualquer compensação financeira para a sua colaboração.

12. COMPENSAÇÃO DO CENTRO DE ESTUDO / INVESTIGADOR

O Centro de Estudo não receberá compensação financeira pela realização do estudo. O investigador principal não receberá compensação financeira pelo seu trabalho na realização do estudo.

13. CONTACTOS

Se tiver questões sobre este estudo deve contactar:

Investigador	Lara Daniela Matos Cunha
Morada	Unidade de Cuidados Pós-anestésicos,
Telefone	964727944
Email	enflaracunha@gmail.com

Se tiver dúvidas relativas aos seus direitos como participante deste estudo, poderá contactar:

Presidente da Comissão de Ética do

Praceta

Telefone:

e-mail: .pt

	INFORMAÇÃO AO PARTICIPANTE E FORMULÁRIO DE CONSENTIMENTO INFORMADO	IM-02.01 Próxima Revisão: Junho/2023
Comissão de Ética para a Saúde		Página 5 de 6

NÃO ASSINE ESTE FORMULÁRIO DE CONSENTIMENTO INFORMADO A MENOS QUE TENHA TIDO A OPORTUNIDADE DE PERGUNTAR E TER RECEBIDO RESPOSTAS SATISFATÓRIAS A TODAS AS SUAS PERGUNTAS.

CONSENTIMENTO INFORMADO

Título do Projeto de Investigação

A incerteza no raciocínio clínico dos enfermeiros da Unidade de Cuidados Pós-Anestésicos.

Nome do Participante:	
BI / CC:	Contactos:
Nome do Investigador:	

No âmbito da realização do Projeto de Investigação acima mencionado, declaro que tomei conhecimento:

- do conteúdo informativo anexo a este formulário e aceito, de forma voluntária, participar neste estudo;
- da natureza, alcance, consequências, potenciais riscos e duração prevista do estudo, assim como do que é esperado da minha parte, enquanto participante;
- e compreendi as informações e esclarecimentos que me foram dados. Sei que a qualquer momento poderei colocar novas questões ao investigador responsável pelo estudo;
- que o investigador se compromete a prestar qualquer informação relevante que surja durante o estudo e que possa alterar a minha vontade de continuar a participar;
- e aceito cumprir o protocolo deste estudo. Comprometo-me ainda a informar o investigador de eventuais alterações do meu estado de saúde que possam ocorrer (*quando aplicável*);
- e autorizo a utilização e divulgação dos resultados do estudo para fins exclusivamente científicos e permito a divulgação desses resultados às autoridades competentes;
- que posso exercer o meu direito de retificação e/ou oposição, nos limites da Lei;
- que sou livre de desistir do estudo a qualquer momento, sem ter de justificar a minha decisão e sem sofrer qualquer penalização. Sei também que os dados recolhidos e tratados até a essa data serão mantidos;
- que o investigador tem o direito de decidir sobre a minha eventual saída prematura do estudo e se compromete a informar-me do respetivo motivo;
- que o estudo pode ser interrompido por decisão do investigador, do promotor ou das autoridades reguladoras.

Local e data:	Assinaturas
	Participante:
	Representante legal:
	Representante legal:
	Investigador (*):

	INFORMAÇÃO AO PARTICIPANTE E FORMULÁRIO DE CONSENTIMENTO INFORMADO	IM-02.01 Próxima Revisão: Junho/2023
Comissão de Ética para a Saúde		Página 6 de 6

(*) Confirmo que expliquei ao participante acima mencionado a natureza, o alcance e os potenciais riscos do estudo acima mencionado.

ANEXO IV

Parecer CE Estudo Manuscrito 5

COMISSÃO DE ÉTICA

da

da

Parecer Nº 1009/02-2024

Título do Projeto:

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidade de Cuidados Pós-Anestésicos: consenso de peritos

Identificação dos Proponentes

Nome(s):

Lara Cunha^{1,3,6}

Márcia Pestana-Santos^{2,3}

Lurdes Lomba^{2,3}

Margarida Reis Santos^{1,4,5}

Filiação Institucional:

¹ Instituto Ciências Biomédicas Abel Salazar (ICBAS)

² Escola Superior de Enfermagem de Coimbra (ESENFC)

³ Unidade de Investigação em Ciências da Saúde: Enfermagem (UICISA:E)

⁴ Escola Superior de Enfermagem do Porto (ESEP)

⁵ CINTESIS@RISE (Center for Health Technology and Services Research)

⁶ Fundação para a Ciência e a Tecnologia (FCT)

Investigador responsável: Lara Daniela Matos Cunha

Orientador: Professora Doutora Margarida Reis Santos

Relator:

Parecer

Referem as investigadoras que o raciocínio clínico exige que os enfermeiros colham e interpretem dados inconclusivos em tempo real. Alegam que as experiências do cuidado pós-operatório são caracterizadas por um contexto clínico complexo e altamente desafiador, ilustrado por uma prática clínica num ambiente incerto e mutável, o que determina tomadas de decisão rápidas e eficientes. Com as atuais exigências impostas pelo fluxo de trabalho de enfermagem, a rápida integração dos recém-licenciados no local de trabalho, as limitações do apoio dos pares no que respeita ao rácio enfermeiro-doente, as estratégias pragmáticas podem ser consideradas um recurso valioso.

Integrado no estudo multi método 'Raciocínio Clínico dos Enfermeiros em Unidade de Cuidados Pós-anestésicos: Contributos para Gerir a Incerteza', pretendem agora desenvolver o Estudo IV método e-delphi modificado, tendo como objetivo geral desenvolver um guia com estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidade de Cuidados Pós-Anestésicos através de consenso de peritos.

A descrição das 5 fases do estudo é clara, assim como o processo de amostragem intencional de peritos, com a continuidade de colaboração da Associação de Enfermeiros de Sala de Operações Portuguesas (AESOP), Associação de Enfermagem Cirúrgica dos Açores (AECA), Associação de Enfermeiros Especialistas em Enfermagem Médico-Cirúrgica (AEEEMC) e Ordem dos Enfermeiros, para acesso aos painelistas e aplicação e disseminação do eDelphi modificado através da plataforma eDelphiOrg.

As questões éticas estão salvaguardadas, nomeadamente a voluntariedade de participação e o consentimento informado e esclarecido. O anonimato está assegurado por um sistema de identificação por senha (criptação) e atribuição a cada participante de um número/código de identificação único para acompanhar o progresso e manter a segurança dos dados, que serão guardados pelo período estritamente necessário às finalidades para que foram recolhidos e serão utilizados apenas para fins da investigação.

COMISSÃO DE ÉTICA

da

da

Está previsto o início da colheita de dados para o mês de abril de 2024 e fim em maio de 2024.

Não são previstos quaisquer danos, riscos ou benefícios para os participantes.

O Termo de Responsabilidade está devidamente assinado.

Nos pressupostos anteriores e havendo cumprimento de todos os requisitos éticos específicos para o estudo, emite-se parecer favorável à sua realização tal como apresentado.

O relator:

Data: 13 /03/2024 O Presidente da Comissão de Éti---

ANEXO V

Minuta Consentimento Informado Estudo Manuscrito 5

CONSENTIMENTO INFORMADO, ESCLARECIDO E LIVRE PARA PARTICIPAÇÃO EM E-INQUÉRITO

Está convidado a participar no estudo de investigação sobre a avaliação do raciocínio clínico em situações de incerteza dos enfermeiros das Unidades de Cuidados Pós-anestésicos. Este estudo está a ser conduzido por Lara Cunha (PhDc), Filipa Ventura (PhD), Márcia Pestana-Santos (PhD), Lurdes Lomba (PhD), Margarida Reis Santos (PhD).

Os objectivos deste estudo de investigação são: a) construir e validar o Teste de Concordância de Scripts para a Enfermagem em contexto Pós-anestésico (Post-anesthesia Nursing Script Concordance Test - PaNSCT); b) aferir o raciocínio clínico dos peritos, enfermeiros que trabalham no contexto clínico perioperatório e estudantes do ensino pós-graduado em enfermagem perioperatória, através do PaNSCT; c) correlacionar o raciocínio clínico aferido através do PaNSCT com as variáveis sociodemográficas, *expertise* clínica e habilitações literárias.

Se é enfermeiro(a) no contexto clínico perioperatório ou está a realizar a sua formação pós-graduada em enfermagem perioperatória, é elegível para participar neste estudo. Serão excluídos enfermeiros que desenvolvam a sua prática clínica perioperatória exclusivamente na pediatria.

Pretende-se que realize o Teste de Concordância de Scripts para a Enfermagem em contexto Pós-anestésico (Post-anesthesia Nursing Script Concordance Test - PaNSCT). Os Testes de Concordância de *Scripts* compreendem cenários clínicos curtos que são concebidos para representar a forma como a nova informação é processada durante o raciocínio clínico. Completar o PaNSCT demorará aproximadamente 20 minutos.

O estudo obteve parecer favorável pela Comissão de Ética da Unidade em Ciências da

A participação na investigação é de carácter voluntário, na qual não existem prejuízos de abandono em qualquer momento. São garantidas a confidencialidade e uso exclusivo dos dados recolhidos para o presente estudo e o anonimato. Deste estudo não advirá nenhuma despesa ou risco.

Ao completar este inquérito, declara que recebeu a informação necessária, ficou esclarecido e aceita participar voluntariamente neste estudo.

*Guarde uma cópia ou imprima o formulário para os seus registos. *

NOTA: Se tiver alguma dúvida ou reserva acerca de algum aspeto relacionado com a sua participação na investigação, poderá contactar o investigador principal (enflaracunha@gmail.com) ou em alternativa a

ANEXO VI

Caderno de Colheita de Dados Estudo Manuscrito 5

Caderno de Colheita de Dados Estudo Metodológico

I.Dados sociodemográficos:

- Idade: __ anos
- Género: Feminino, Masculino, Outro, Prefiro Não Declarar
- Categoria Profissional: Enfermeiro, Enfermeiro Especialista, Enfermeiro Gestor
- Grau académico: Licenciatura, Mestrado, Doutoramento
- Especialidade: Enfermagem Comunitária, Enfermagem Médico-Cirúrgica (Enfermagem à Pessoa em Situação Crítica, Enfermagem à Pessoa em Situação Crónica, Enfermagem à Pessoa em Situação Paliativa e Enfermagem à Pessoa em Situação Perioperatória), Enfermagem de Reabilitação, Enfermagem de Saúde Infantil e Pediátrica, Enfermagem de Saúde Materna e Obstétrica, Enfermagem de Saúde Mental e Psiquiátrica, Sem Especialidade, A Realizar Especialidade
- A Realizar Especialidade: Enfermagem Comunitária, Enfermagem Médico-Cirúrgica (Enfermagem à Pessoa em Situação Crítica, Enfermagem à Pessoa em Situação Crónica, Enfermagem à Pessoa em Situação Paliativa e Enfermagem à Pessoa em Situação Perioperatória), Enfermagem de Reabilitação, Enfermagem de Saúde Infantil e Pediátrica, Enfermagem de Saúde Materna e Obstétrica, Enfermagem de Saúde Mental e Psiquiátrica
Experiência Profissional: __ anos
- Experiência Profissional na Área do Perioperatório: __ anos
- Experiência Profissional em Contexto Clínico Pós-anestésico: __ anos
- Contexto Clínico Laboral: Bloco Operatório, Unidade de Cuidados Pós-anestésicos, Unidade de Cirurgia de Ambulatório, Bloco Operatório e Unidade de Cuidados Pós-anestésicos
- Tipologia de Unidades de Saúde: Pública, Privada, Público-Privada

II.Casos Clínicos:

1

Descrição do Caso Clínico: Mulher de 72 anos, queda da própria altura no domicílio da qual resultou uma fractura trocantérica esquerda. Submetida a PFNA através de raquianestesia. À chegada à UCPA apresenta ramsay 2, bromage 2. Agitada mas "sem dor" (sic).

Se está a pensar em....	E encontra...	As hipóteses tornar-se-ão...
Q1 - Avaliar globo vesical	Defesa à palpação supra púbica	-2 -1 0 +1 +2
Q2 - Avaliar dor através da PAINAD	Expressão facial franzida, linguagem corporal tensa e gemidos altos esporádicos	-2 -1 0 +1 +2
Q3 - Investigar antecedentes pessoais de síndrome demencial	Antecedentes pessoais de dislipidémia e hipertensão arterial	-2 -1 0 +1 +2
Ação de Investigação	Informação nova	Escala tipo Likert 5 pontos
		-2 fortemente contra-indicado; -1 contra-indicado; 0 nem indicado nem contra-indicado; +1 indicado; +2 fortemente indicado

2

Descrição do Caso Clínico: Masculino de 34 anos, ASA I, submetido a Procedimento de Whipple. Anestesista do intra operatório refere que se encontra “muito sonolento, de difícil despertar”. Reversão do bloqueio neuromuscular com 400 mg de Sugamadex EV. À chegada à UCPA apresenta ramsay 5.

Se está a pensar em....	E encontra...	As hipóteses tornar-se-ão...
Q1 - Realizar gasometria arterial	pCO2 42 mmHg	-2 -1 0 +1 +2
Q2 - Avaliar glicémia capilar	Glicémia capilar 36 mg/dl	-2 -1 0 +1 +2
Q3 - Investigar administração de opióides no intra operatório	0,15 mg fentanil EV na indução anestésica	-2 -1 0 +1 +2
Ação de Investigação	Informação nova	Escala tipo Likert 5 pontos
		-2 fortemente contra-indicado; -1 contra-indicado; 0 nem indicado nem contra-indicado; +1 indicado; +2 fortemente indicado

3

Descrição do Caso Clínico: Feminino de 42 anos, com antecedentes pessoais de excesso de peso e Síndrome da Apneia Obstrutiva do Sono. Submetida a clipagem de aneurisma cerebral da artéria comunicante posterior. Avaliação neurológica inicial: ECG 13 (RO3, RV4, RM6), pupilas anisocóricas (OD midríase arreativa), ptose palpebral direita e exotropia direita.		
Se está a pensar em....	E encontra...	As hipóteses tornar-se-ão...
Q1 - Investigar <i>status</i> neurológico pré operatório	Relato cirúrgico de lesão do III par craniano (oculomotor)	-2 -1 0 +1 +2
Q2 - Avaliar pressão de perfusão cerebral	Pressão intracraniana de 3 mmHg e Pressão Arterial Média de 85 mmHg	-2 -1 0 +1 +2
Q3 - Avaliar presença do síndrome de Urrets-Zavalía	Administração recente de atropina EV	-2 -1 0 +1 +2
Ação de Investigação	Informação nova	Escala tipo Likert 5 pontos -2 fortemente contra-indicado; -1 contra-indicado; 0 nem indicado nem contra-indicado; +1 indicado; +2 fortemente indicado

ANEXO VII

Parecer CE Estudo Manuscrito 8

COMISSÃO DE ÉTICA

da

da

Parecer Nº 942/02-2023

Título do Projeto:

Avaliação do raciocínio clínico em situações de incerteza dos enfermeiros das Unidades de Cuidados Pós-anestésicos: Inquérito nacional através do teste de concordância de scripts.

Identificação dos Proponentes

Nome(s):

Lara Cunha^{1,3}
Márcia Pestana-Santos^{2,3}
Lurdes Lomba^{2,3}
Margarida Reis Santos^{1,4,5}

Filiação Institucional:

¹ Instituto Ciências Biomédicas Abel Salazar (ICBAS)
² Escola Superior de Enfermagem de Coimbra (ESEnC)
³ Unidade de Investigação em Ciências da Saúde: Enfermagem (UICISA:E)
⁴ Escola Superior de Enfermagem do Porto (ESEP)
⁵ CINTESIS@RISE (Center for Health Technology and Services Research)

Investigador responsável: Lara Cunha

Orientador: Margarida Reis Santos

Relator:

Parecer

Fundamentadas na literatura, referem as investigadoras que as experiências do cuidado pós-operatório são caracterizadas por um contexto clínico complexo e altamente desafiador, ilustrado por uma prática clínica num ambiente incerto e mutável, o que determina tomadas de decisão rápidas e eficientes. Em ambientes de prática clínica, onde existem situações de incerteza, o raciocínio clínico para resolução de problemas é contextualizado e invoca conhecimentos diferenciados e organizados, conhecidos como scripts mentais, que se referem a redes associativas e ao desenvolvimento de relações causais entre elementos de conhecimento que orientam a seleção da informação, a sua interpretação, e a sua memorização.

Assim, propõem-se a realizar um estudo transversal de paradigma quantitativo, tendo como objetivo geral desenvolver um instrumento de avaliação do raciocínio clínico de enfermagem em situações de incerteza em contexto pós-anestésico, baseado na Teoria de Scripts e através da ferramenta de Teste de Concordância de Scripts.

Decorrerá em quatro fases:

Fase 1 - Desenvolvimento do Teste de Concordância de Scripts, através da criação por peritos de cenários clínicos curtos incorporando incerteza, que são seguidos por uma série de juízos qualitativos, cujo efeito é capturado com uma escala tipo Likert.

Fase 2 - Teste piloto - Validação do Teste de Concordância de Scripts com seis participantes (dois para cada grupo amostral) para verificar a sua interpretabilidade.

Fase 3 - Aplicação e disseminação do inquérito nacional via web, através da plataforma de inquéritos online soSci Survey. Será solicitada a colaboração na investigação à Associação de Enfermeiros de Sala de Operações Portuguesas (AESOP), Associação de Enfermagem Cirúrgica dos Açores (AECA), Associação de Enfermeiros Especialistas em Enfermagem Médico-Cirúrgica (AEEEMC) e Ordem dos Enfermeiros, para divulgar o inquérito através de listas de correio

COMISSÃO DE ÉTICA

da

da

eletrónico dos seus constituintes, de acordo com a população alvo.

Fase 4 - Análise dos dados, assistida pelo Statistical Package for the Social Sciences 20 (SPSS).

A população deste estudo será constituída por amostragem intencional, feita com três grupos:

- peritos, que serão enfermeiros especialistas em enfermagem médico-cirúrgica (ramo de enfermagem perioperatória) ou mestres em enfermagem perioperatória que tenham pelo menos três anos de prática clínica em contexto pós-anestésico;
- enfermeiros que desenvolvem a sua prática clínica em contexto perioperatório, excluindo os que desenvolvam a sua prática clínica perioperatória exclusivamente na pediatria.;
- estudantes de pós-licenciatura de especialização em enfermagem médico-cirúrgica (ramo pessoa em situação perioperatória) ou mestrado em enfermagem perioperatória.

As questões éticas estão salvaguardadas, nomeadamente a voluntariedade de participação e o consentimento informado e esclarecido online, obtido após a afirmação (clique) no local correspondente em concordância com os termos de participação previamente apresentados. São também facultados o nome e informação de contacto da investigadora. O anonimato está assegurado por um sistema de identificação por senha (encriptação) e atribuição a cada participante de um número/código de identificação único para acompanhar o progresso e manter a segurança dos dados, que serão guardados pelo período estritamente necessário às finalidades para que foram recolhidos e serão utilizados apenas para fins da investigação.

Está previsto o início da colheita de dados para o mês de abril de 2023 e fim em julho de 2023.

Não são previstos quaisquer danos, riscos ou benefícios para os participantes.

O Termo de Responsabilidade está devidamente assinado.

Nos pressupostos anteriores e havendo cumprimento de todos os requisitos éticos específicos para o estudo, emite-se parecer favorável à sua realização tal como apresentado.

O relator:

Data: 15 /03/2023 O Presidente da Comissão de Ética:

ANEXO VIII

Caderno de Colheita de Dados e Minuta
de Consentimento Informado Estudo Manuscrito 8

23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

Bem-vindo(a) ao eQuestionário para Peritos em Enfermagem Perioperatória

Estimado(a) Enfermeiro(a)

Gostaríamos de convidá-lo(a) a participar na investigação como perito em enfermagem perioperatória. Este estudo é realizado com o recurso ao consenso dos peritos com base nos seguintes critérios de inclusão: **ser enfermeiro(a) especialista em enfermagem médico-cirúrgica e/ou mestrado em enfermagem perioperatória, ter pelo menos 3 anos de prática clínica perioperatória como enfermeiro especialista**. Em alternativa, ser **investigador e/ou ter desenvolvido investigação na área científica da enfermagem perioperatória**.

O objetivo deste e-Delphi é alcançar um **consenso sobre as estratégias de apoio ao raciocínio clínico de enfermagem no contexto pós-anestésico aplicáveis de forma pragmática à beira do leito**. Pretendemos **identificar e avaliar as estratégias que melhor se adequam a este cenário clínico específico**.

Estas estratégias foram selecionadas através de um mapeamento prévio (ver [Scoping Review Protocol](#)) e incluem técnicas, métodos, instrumentos, intervenções, ferramentas e recursos utilizados na prática de enfermagem. Os estudos incluídos foram avaliados de acordo com: adequação do conhecimento, capacidade de colher dados clínicos relevantes, uso de estratégias de raciocínio apropriadas, habilidade para refletir e (re)avaliar a tomada de decisão à beira do leito.

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1/44

23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidade de Cuidados Pós-Anestésicos: consenso de peritos

Agradecemos a sua valiosa contribuição.

* ~~Indica uma pergunta obrigatória~~

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2/44

23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidade de Cuidados Pós-Anestésicos: consenso de peritos

Consentimento Informado, Esclarecido e Livre para Participação em e-Delphi Modificado

Estimado(a) Enfermeiro(a), Professor(a), Investigador(a)

Está convidado a participar no estudo de investigação sobre estratégias de apoio ao raciocínio clínico dos enfermeiros nas Unidade de Cuidados Pós-Anestésicos. Este estudo está a ser conduzido por Lara Cunha (PhD), Márcia Pestana-Santos (PhD), Lurdes Lomba (PhD), Margarida Reis Santos (PhD). Os objetivos deste estudo de investigação são: desenvolver um guia com estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidade de Cuidados Pós-Anestésicos através de consenso de peritos.

A capacidade de articular conhecimentos, atitudes ou habilidades para resolver problemas em situações concretas de trabalho, devem ser contextualizadas aos valores e cultura locais. Por essa razão, o(a) senhor(a) enfermeiro(a) é convidado(a) a participar na investigação como perito em enfermagem perioperatória. Os critérios de inclusão como perito são: ser enfermeiro especialista em enfermagem médico-cirúrgica e/ou mestrado em enfermagem perioperatória, ter pelo menos 3 anos de prática clínica perioperatória como especialista. Em alternativa, ser investigador e/ou ter desenvolvido investigação na área científica da enfermagem perioperatória.

O Painel Delphi consistirá no máximo de três rondas de questionários, os quais serão enviados eletronicamente. A sua participação envolverá a avaliação das estratégias propostas, fornecendo *feedback* e sugestões de melhoria. Estimamos que cada ronda de questionários exija aproximadamente 15 a 20 minutos do seu tempo. Posteriormente, os resultados da investigação serão apresentados sob forma de guia de apoio à prática clínica.

O estudo obteve parecer favorável pela Comissão de Ética da Unidade de Investigação em Ciências da Saúde: Enfermagem (UICISA:E) da Escola Superior de Enfermagem de Coimbra.

A participação na investigação é de caráter voluntário, não existem prejuízos de abandono em qualquer momento. São garantidos a confidencialidade e uso exclusivo dos dados recolhidos para o presente estudo e o anonimato. Deste estudo não advirá nenhuma despesa ou risco.

Ao completar este questionário e a totalidade das rondas, declara que recebeu a informação necessária, ficou esclarecido e aceita participar voluntariamente neste estudo.

NOTA: Se tiver alguma dúvida acerca de algum aspeto relacionado com a sua participação na investigação, ou quiser requerer certificado de participação, poderá contactar o investigador principal (enflaracunha@esenfc.pt).

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3/44

23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

1. Aceita participar no estudo como perito? *

Marcar apenas uma oval.

☐ Sim

☐ Não

Caraterização Sociodemográfica

2. Idade (anos)

3. Género

Marcar apenas uma oval.

☐ Feminino

☐ Masculino

☐ Não binário

☐ Prefiro não declarar

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4/44

23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

4. Categoria Profissional

Marcar apenas uma oval.

- ☐ Enfermeiro Especialista
☐ Enfermeiro Gestor
☐ Professor Adjunto
☐ Professor Coordenador
☐ Investigador

5. Grau Académico (assinale o mais elevado)

Marcar apenas uma oval.

- ☐ Licenciatura
☐ Mestrado
☐ Doutoramento

5/44

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23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

6. Área Científico-pedagógica/Especialização

Marcar apenas uma oval.

- ☐ Enfermagem Médico-cirúrgica
- ☐ Enfermagem Médico-cirúrgica - ramo pessoa em situação crítica
- ☐ Enfermagem Médico-cirúrgica - ramo pessoa em situação perioperatória
- ☐ Enfermagem Médico-cirúrgica - ramo pessoa em situação crónica
- ☐ Enfermagem Médico-cirúrgica - ramo pessoa em situação paliativa

7. Tempo de Experiência Profissional na Área do Perioperatório (anos)

8. Experiência Profissional em Contexto Clínico Perioperatório

Marcar apenas uma oval.

- ☐ Bloco Operatório
- ☐ Unidade de Cuidados Pós-anestésicos
- ☐ Unidade de Cirurgia de Ambulatório
- ☐ Bloco Operatório e Unidade de Cuidados Pós-anestésicos
- ☐ Outra

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6/44

23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

Painel de Peritos

Nesta secção, serão descritas sumariamente 14 estratégias de apoio ao raciocínio clínico em enfermagem. Algumas destas estratégias serão apresentadas com o auxílio de imagens/esquemas, que podem não estar traduzidas para o português. O objetivo é compreender a **relevância**, **aplicabilidade** e **grau de concordância** de cada estratégia para a sua potencial utilização pelos enfermeiros que trabalham nas Unidades de Cuidados Pós-anestésicos na sua prática clínica. Sabemos, pelo mapeamento prévio, que as estratégias são funcionais para outros contextos da prática de enfermagem. Através da sua análise e *feedback*, pretende-se perceber a sua **adequação ao contexto clínico pós-anestésico**.

Para cada estratégia apresentada, pedimos-lhe que avalie:

- a) o quão importante é cada estratégia (i.e., **Relevância**);
- b) o quão aplicável seria (i.e., **Aplicabilidade**);
- c) o seu **grau de concordância** com a estratégia enquanto perito.

A avaliação de cada estratégia é feita com recurso a escala tipo *Likert* em que:

- 1 corresponde a "não sei"
- 2 corresponde a "discordo totalmente"
- 3 corresponde a "discordo"
- 4 corresponde a "não concordo nem discordo"
- 5 corresponde a "concordo"
- 6 corresponde a "concordo totalmente":

Estratégia 1. Diário Reflexivo [Journaling]

O **Diário Reflexivo** é uma produção escrita das experiências clínicas dos enfermeiros através das suas próprias palavras. É uma ferramenta útil para desenvolver o pensamento crítico, a reflexão e as competências de descrição, análise crítica, síntese e de autoavaliação.

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7/44

23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

Exemplo de Diário Reflexivo (estruturado)

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8/44

23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

DATE : 21/24

S M T W T H F S

check-in

MY RANKING OF THE DAY :

☆☆☆☆☆

I FEEL :

😊 😐 😞

3 THINGS I LEARNED TODAY :

○ the 4 stages of labor

○ the 1st stage has 3 phases

○ pitocin- stimulates contractions

MOST REWARDING INTERACTION I HAD :

My patient shared stories of growing up in her home country while I got her IV started. Afterwards, she told me that I did a great job.

I AM PROUD OF :

I inserted my first IV today! Woo hoo! I was so nervous but I was successful and saw the flash of blood return. The patient was able to get the medications she needed.

SOMETHING I AM LOOKING FORWARD TO :

I am looking forward to mother-baby unit. I can't wait to take care of new moms and welcome little ones into this world. I'm excited to be apart of someone's life- changing moment and see the look of wonder in their eyes.

I AM THANKFUL FOR :

I am thankful for my preceptor who was patient with me while I was trying to get the IV started. She watched quietly as I thought my way through all the steps.

9/44

https://docs.google.com/forms/d/1IL-qtaxixJBBddtYspSLWSN4JrHrBrAt_JXbLSO3oT4/edit

9. Em relação à Estratégia 1 "Diário Reflexivo", como avalia:

Marcar apenas uma oval por linha.

	Não sei	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo	Concordo totalmente
Relevância	☐	☐	☐	☐	☐	☐
Aplicabilidade	☐	☐	☐	☐	☐	☐
Concordância	☐	☐	☐	☐	☐	☐

10. Comente ou sugira alterações à Estratégia 1 "Diário Reflexivo" para a sua adequação ao contexto clínico pós-anestésico.

23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

Estratégia 2. Método de Pensar em Voz Alta [Thinking Aloud Method - TAM]

Os participantes verbalizam em tempo real os pensamentos, raciocínio e o processo de tomada de decisão durante a execução de uma tarefa. Os observadores ouvem e tomam notas sobre os processos de pensamento e as ações dos participantes. Utilizam a informação recolhida para dar *feedback*, identificar problemas e sugerir soluções.

11. Em relação à Estratégia 2 "Método de Pensar em Voz Alta", como avalia:

Marcar apenas uma oval por linha.

	Não sei	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo totalmente
Relevância	☐	☐	☐	☐	☐
Aplicabilidade	☐	☐	☐	☐	☐
Concordância	☐	☐	☐	☐	☐

23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

12. Comente ou sugira alterações à Estratégia 2 "Método de Pensar em Voz Alta" para a sua adequação ao contexto clínico pós-anestésico.

Estratégia 3. Mentoria

A **Mentoria** é uma aliança profissional em que os indivíduos trabalham em conjunto ao longo do tempo para apoiar o seu crescimento pessoal e profissional. O mentor é um profissional sénior ou mais experiente que é designado para funcionar como conselheiro, orientador ou guia para um profissional menos experiente. É responsável por oferecer ajuda e *feedback* ao profissional sob a sua supervisão.

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12/44

13. Em relação à Estratégia 3 "Mentoria", como avalia:

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	Não sei	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo	Concordo totalmente
Relevância	☐	☐	☐	☐	☐	☐
Aplicabilidade	☐	☐	☐	☐	☐	☐
Concordância	☐	☐	☐	☐	☐	☐

14. Comente ou sugira alterações à Estratégia 3 "Mentoria" para a sua adequação ao contexto clínico pós-anestésico.

Estratégia 4. Tomada de Decisão Partilhada [Shared Decision Making - SDM]

A **Tomada de Decisão Partilhada** basea-se no processo de comunicação através do qual os doentes e os profissionais de saúde trabalham em conjunto para tomar decisões óptimas em matéria de cuidados de saúde que estejam de acordo com o que é mais importante para os doentes. A SDM requer três componentes: evidências clínicas claras e imparciais sobre as opções razoáveis e os riscos, benefícios e encargos de cada alternativa (incluindo a ausência de intervenção), experiência do profissional de saúde na comunicação e adaptação dessa evidência a cada doente.

15. Em relação à Estratégia 4 "**Tomada de Decisão Partilhada**", como avalia:

Marcar apenas uma oval por linha.

	Não sei	Discordo totalmente	Discordo	Não concordo nem	Concordo totalmente
Relevância	☐	☐	☐	☐	☐
Aplicabilidade	☐	☐	☐	☐	☐
Concordância	☐	☐	☐	☐	☐

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Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

16. Comente ou sugira alterações à Estratégia 4 "Tomada de Decisão Partilhada" para a sua adequação ao contexto clínico pós-anestésico.

Estratégia 5. Discussão de Caso utilizando o Ciclo Reflexivo de Gibbs

Esta estratégia combina a **discussão de caso clínico** com a estrutura do **Ciclo Reflexivo de Gibbs**. Fases: a) descrever o caso clínico em pormenor; b) sentimentos: discutir as emoções e as reações; c) avaliar a situação, destacando os aspectos positivos e negativos; d) analisar para compreender por que razão as coisas aconteceram como aconteceram; e) concluir com as lições aprendidas; f) plano de ação para melhorias futuras.

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15/44

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Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

Ciclo Reflexivo de Gibbs

Gibbs' Reflective Cycle

Gibbs' Reflective Cycle



6 | SlideSalad.com

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16/44

17. Em relação à Estratégia 5 "Discussão de Caso utilizando o Ciclo Reflexivo de Gibbs", como avalia:

Marcar apenas uma oval por linha.

	Não sei	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo	Concordo totalmente
Relevância	☐	☐	☐	☐	☐	☐
Aplicabilidade	☐	☐	☐	☐	☐	☐
Concordância	☐	☐	☐	☐	☐	☐

18. Comente ou sugira alterações à Estratégia 5 "Discussão de Caso utilizando o Ciclo Reflexivo de Gibbs" para a sua adequação ao contexto clínico pós-anestésico.

23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

Estratégia 6. **National Early Warning Score [NEWS®]**

Sistema de pontuação simples em que é atribuído um score à monitorização de sinais vitais por rotina e respetivo registo no processo clínico do doente. Os seis parâmetros fisiológicos simples constituem a base do sistema de pontuação:

- Frequência respiratória
- Saturação de oxigénio
- Temperatura
- Pressão arterial sistólica
- Frequência cardíaca
- Nível de consciência.

É atribuída uma pontuação a cada um destes sinais vitais à medida que são mensurados e agregados, e a magnitude da pontuação reflete o grau de variação extrema do parâmetro em relação à norma.

https://docs.google.com/forms/d/1IL-qlaxixJBBdtYspSLWSN4JrhHbrAt_JXblSO3oT4/edit

18/44

Physiological Parameters	3	2	1	0	1	2	3
Respiration Rate (BPM)	≤8		9-11	12-20		21-24	≥25
Oxygen Saturations (%)	≤91	92-93	94-95	≥96			
Any Supplemental Oxygen		Yes		No			
Temperature (°C)	≤35		35.1-36.0	36.1-38.0	38.1-39.0	≥39.1	
Systolic Blood Pressure (mmHg)	≤90	91-100	101-110	111-219			≥220
Heart Rate (BPM)	≤40		41-50	51-90	91-110	111-130	≥131
Level of Consciousness				A			V, P or U

Escala de Risco Clínico

NEWS Scores	Clinical Risk
0	Low
Aggregate 1 - 4	
RED Score* (Individual parameter scoring 3) Aggregate 5 - 6	Medium
Aggregate 7 or more	High

19. Em relação à Estratégia 6 "NEWS®", como avalia:

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	Não sei	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo	Concordo totalmente
Relevância	☐	☐	☐	☐	☐	☐
Aplicabilidade	☐	☐	☐	☐	☐	☐
Concordância	☐	☐	☐	☐	☐	☐

20. Comente ou sugira alterações à Estratégia 6 "NEWS®" para a sua adequação ao contexto clínico pós-anestésico.

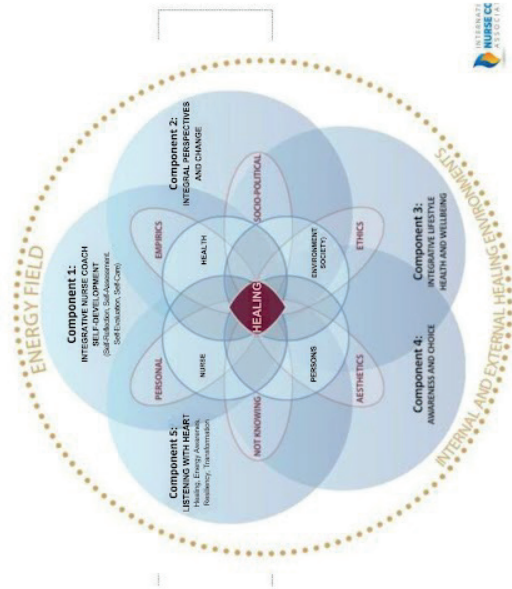
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Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

Estratégia 7. Enfermeiro Coach Integrativo [INC]

O **Enfermeiro Coach Integrativo** adoptam uma visão compreensiva da saúde, considerando os aspetos físicos, emocionais, sociais e espirituais para desenvolver um plano de cuidado integral. Trabalham em colaboração com a pessoa e família, capacitando-os para assumirem um papel ativo na gestão da saúde e no processo de tomada de decisão. Esta abordagem concentra-se na promoção da saúde e do bem-estar, em vez de se limitar a gerir a doença, dando ênfase às estratégias preventivas e às modificações do estilo de vida.

Theory of Integrative Nurse Coaching (TINC)



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21. Em relação à Estratégia 7 "Enfermeiro Coach Integrativo", como avalia:

Marcar apenas uma oval por linha.

	Não sei	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo	Concordo totalmente
Relevância	☐	☐	☐	☐	☐	☐
Aplicabilidade	☐	☐	☐	☐	☐	☐
Concordância	☐	☐	☐	☐	☐	☐

22. Comente ou sugira alterações à Estratégia 7 "Enfermeiro Coach Integrativo" para a sua adequação ao contexto clínico pós-anestésico.

Estratégia 8. Análise de Decisão Multicritério [Multi-Criteria Decision Analysis - MCDA]

Análise da melhor alternativa de decisão, ou de conjunto de boas alternativas ordenadas por critérios explícitos, os quais possuem, cada um, uma importância relativa distinta, sendo, portanto, atribuídos pesos diferentes. Envolve a estruturação do problema (selecção de participantes, alternativas e critérios), a modelação (ponderação, pontuação e agregação), a interpretação dos resultados e a tomada de decisão. Fases: 1) formulação do problema, 2) identificar os requisitos, 3) definir objetivos, 4) identificar várias alternativas, 5) desenvolver critérios, e 6) identificar e aplicar a técnica de tomada de decisão.

Exemplo de esquema de Análise de Decisão Multicritério: nesta análise consideram-se a solução atualmente utilizada, a alternativa 1 e a alternativa 2. Após a interpretação de critérios (aqui omissos), é feita uma avaliação comparativa das alternativas com base na classificação/ordenação (de 5 a 1). No final da avaliação, é seleccionada a alternativa 1.



23. Em relação à Estratégia 8 "Análise de Decisão Multicritério", como avalia:

Marcar apenas uma oval por linha.

	Não sei	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo totalmente
Relevância	☐	☐	☐	☐	☐
Aplicabilidade	☐	☐	☐	☐	☐
Concordância	☐	☐	☐	☐	☐

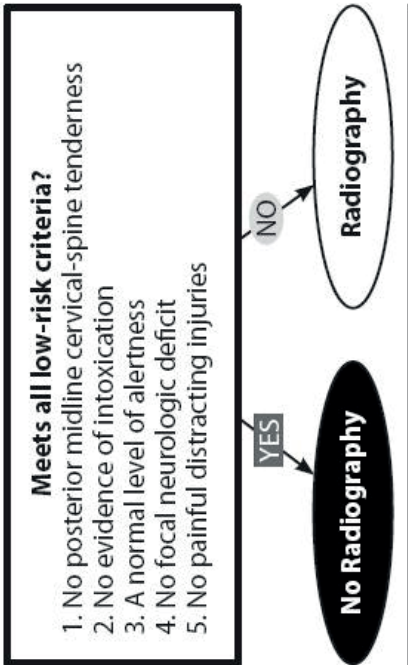
24. Comente ou sugira alterações à Estratégia 8 "Análise de Decisão Multicritério" para a sua adequação ao contexto clínico pós-anestésico.

Estratégia 9. **National Emergency X Radiography Utilization Study [NEXUS®]**

O NEXUS (National Emergency X-Radiography Utilization Study) é constituído por um conjunto de critérios para decidir que vítimas de trauma não precisam de exames de imagem da coluna cervical. De acordo com estas directrizes, se todos os critérios forem cumpridos, as radiografias laterais do pescoço são desnecessárias em vítimas de trauma. O NEXUS® inclui cinco critérios: ausência de sensibilidade na coluna cervical, ausência de evidência de intoxicação, sem alteração do estado de consciência, ausência de lesões neurológicas focais e ausência de lesões distrativas.

NEXUS Criteria for C-spine Injury

Figure 11. National Emergency X-Radiography Utilization Study (NEXUS) Criteria



25. Em relação à Estratégia 9 "NEXUS®", como avalia:

Marcar apenas uma oval por linha.

	Não sei	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo totalmente
Relevância	☐	☐	☐	☐	☐
Aplicabilidade	☐	☐	☐	☐	☐
Concordância	☐	☐	☐	☐	☐

26. Comente ou sugira alterações à Estratégia 9 "NEXUS®" para a sua adequação ao contexto clínico pós-anestésico.

Estratégia 10. **Conjunto de ferramentas que inclui o Modelo 4A, o Preceptor de Cinco Minutos (5MP), o Método "Pensar em Voz Alta" (TAM), o Questionamento e o Feedback [Toolkit comprising 4A Model, Five Minute Preceptor (5MP), think aloud method (TAM), questioning and feedback]**

Este conjunto de ferramentas integra várias estratégias para criar uma abordagem abrangente. Combina o **Modelo 4A** (Ancorar, Acrescentar, Aplicar, Afastar), **Preceptor de Cinco Minutos** (obter um compromisso, indagar evidência cinética de apoio, ensinar regras gerais, reforçar o que foi bem feito, corrigir erros), **Método Pensar em Voz Alta** (verbalizar os pensamentos em voz alta enquanto se executa uma tarefa ou atividade de resolução de problemas), **Questionar** (fazer uma série de perguntas para estimular o pensamento crítico, aprofundar a compreensão e promover o envolvimento ativo com o assunto) e **Feedback** (informação fornecida sobre o desempenho ou compreensão de uma tarefa, conceito ou competência).

27. Em relação à Estratégia 10 "Modelo 4A, 5MP, TAM, Questionamento e Feedback", como avalia:

Marcar apenas uma oval por linha.

	Não sei	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo totalmente
Relevância	☐	☐	☐	☐	☐
Aplicabilidade	☐	☐	☐	☐	☐
Concordância	☐	☐	☐	☐	☐

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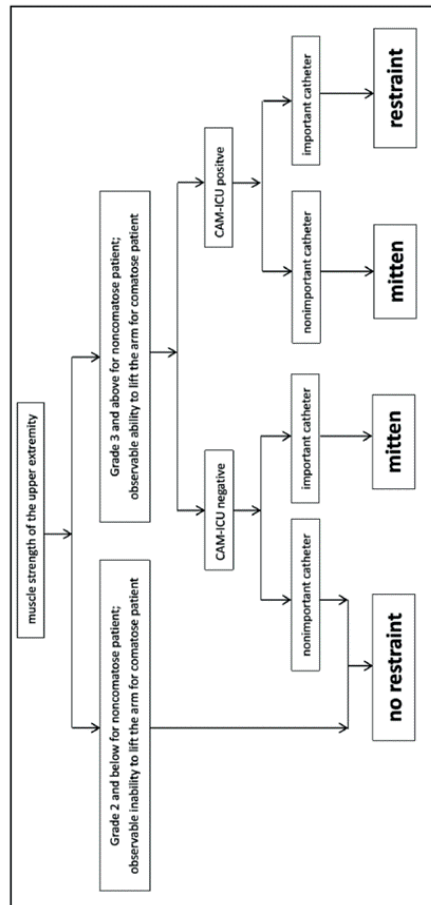
Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

28. Comente ou sugira alterações à Estratégia 10 "Modelo 4A, 5MP, TAM, Questionamento e Feedback" para a sua adequação em contexto clínico pós-anestésico.

Estratégia 11. **Árvore de Decisão de Restrição Física [Restrained Decision Tree - RDT]**

A **Árvore de Decisão de Restrição** é uma ferramenta eficaz para a tomada de decisão para o uso de contenção física dos membros superiores, mantendo a segurança do doente crítico adulto. Inclui a avaliação da força muscular dos membros superiores, o estado de consciência e a determinação da importância/funcionalidade do cateter.

Restraint Decision Tree



29. Em relação à Estratégia 11 "Árvore de Decisão de Restrição", como avalia:

Marcar apenas uma oval por linha.

	Não sei	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo totalmente
Relevância	☐	☐	☐	☐	☐
Aplicabilidade	☐	☐	☐	☐	☐
Concordância	☐	☐	☐	☐	☐

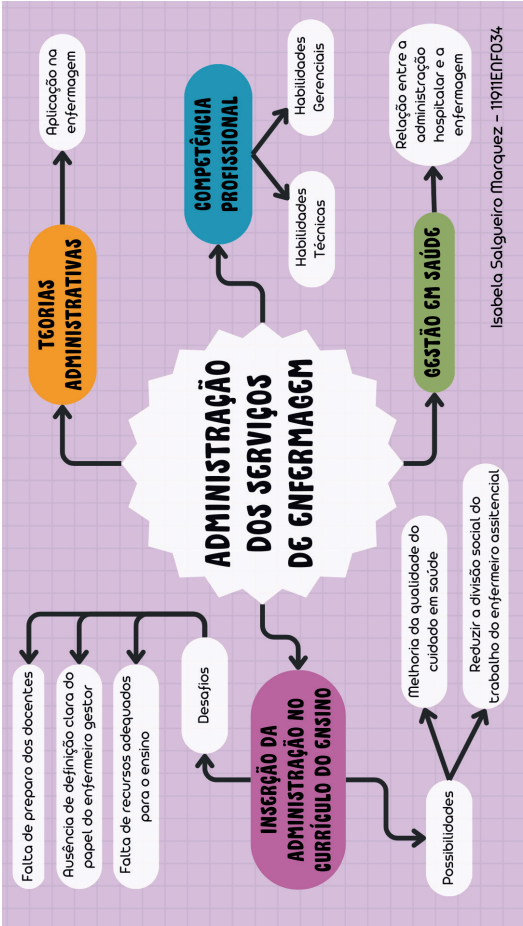
30. Comente ou sugira alterações à Estratégia 11 "Árvore de Decisão de Restrição" para a sua adequação em contexto clínico pós-anestésico.

Estratégia 12. Mapeamento de Conceitos em Equipe [Team Concept Mapping - TCM]

O mapa de conceitos é uma ferramenta visual para descrever ideias relacionadas num tópico principal. É usado para definir, explicar e analisar estruturas complexas de pensamento ou processos, dividindo uma grande ideia em pequenas partes, tornando os pormenores mais fáceis de entender.

É estruturada mas adaptável, organizando as ideias da equipa e representando-as visualmente em mapas interligados, reflectindo as percepções das partes interessadas e fornecendo resultados imediatamente utilizáveis. Facilita o trabalho em equipa e o desempenho, incentivando a comunicação entre os membros, promovendo uma análise eficaz das tarefas e fomentando o debate e a consideração de múltiplas perspectivas e conhecimentos integrados.

Mapeamento de Conceitos em Equipe (exemplo)



31. Em relação à Estratégia 12 "Mapeamento de Conceitos em Equipa", como avalia:

Marcar apenas uma oval por linha.

	Não sei	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo	Concordo totalmente
Relevância	☐	☐	☐	☐	☐	☐
Aplicabilidade	☐	☐	☐	☐	☐	☐
Concordância	☐	☐	☐	☐	☐	☐

32. Comente ou sugira alterações à Estratégia 12 "Mapeamento de Conceitos em Equipa" para a sua adequação em contexto clínico pós-anestésico.

23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

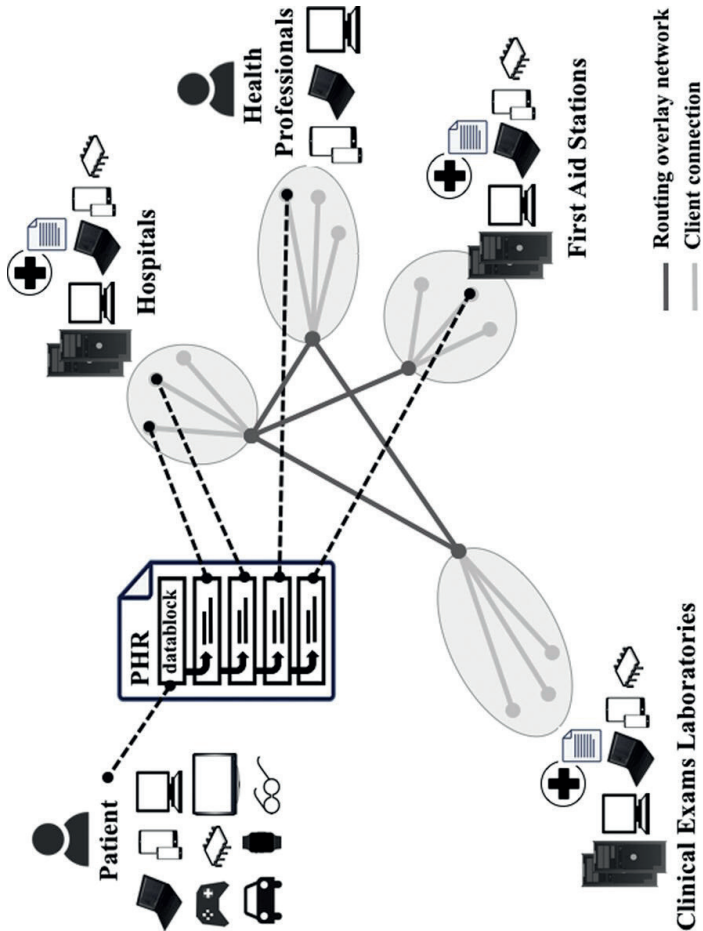
Estratégia 13. Apoio à Decisão Clínica entre Doentes e Prestadores de Cuidados de Saúde com o Registo de Saúde Pessoal [Shared Patient-Provider Clinical Decision Support Services with Personal Health Record - SDM-PHR]

Integração digital de PHRs para apoio à decisão clínica. Capacita os doentes, dando-lhes acesso às suas informações de saúde e envolvendo-os na tomada de decisão. Conduz a planos de cuidados mais personalizados e eficazes, melhorando potencialmente os resultados em termos de saúde. Simplifica a partilha de informações, reduzindo a redundância e melhorando a eficiência dos fluxos de trabalho clínicos. Aumenta a transparência, criando confiança entre os doentes e os prestadores de cuidados de saúde.

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34/44

PHR exemplo



33. Em relação à Estratégia 13 "Apoio à Decisão Clínica entre Doentes e Prestadores de Cuidados de Saúde com o Registo de Saúde Pessoal", como avalia:

Marcar apenas uma oval por linha.

	Não sei	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo totalmente
Relevância	☐	☐	☐	☐	☐
Aplicabilidade	☐	☐	☐	☐	☐
Concordância	☐	☐	☐	☐	☐

34. Comente ou sugira alterações à Estratégia 13 "Apoio à Decisão Clínica entre Doentes e Prestadores de Cuidados de Saúde com o Registo de Saúde Pessoal" para a sua adequação em contexto clínico pós-anestésico.

23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

Estratégia 14. Forma Universal das Opções de Tratamento [Universal Form of Treatment Options Decision Boxes - UFTO]

A tomada de decisão de não reanimação é difícil. O UFTO é constituído por caixas de decisão onde são apresentados resumos clínicos concisos que integram a evidência científica e oferecem informações sobre as opções de tratamento adaptadas (reanimar/não reanimar). A abordagem UFTO permite: ser universal; documentar primeiro as discussões e as condições clínicas; clarificar os objectivos do tratamento global (tratamento ativo ou cuidados de suporte óptimos); contextualizar a decisão de reanimação entre outras decisões de tratamento; ter uma caixa de texto livre para "optar por não participar" em tratamentos invasivos.

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37/44

23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

Universal Form of Treatment Options [UFTO] (frente)

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38/44

23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidade de Cuidados Pós-Anestésicos: consenso de peritos

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Universal Form of Treatment Options

Addressograph

Relevant information about patient's situation:

Details of discussion (and/or reasons for not having one, if none has taken place):

Please continue overleaf

This patient is for the following treatment plan: (please sign one of the below boxes, add documentation where appropriate, complete the resuscitation box, and sign and date)

ACTIVE TREATMENT
e.g. investigations, surgical and medical interventions and treatments, referral to on-call doctors or outreach in event of deterioration
Signature.....Date.....

OPTIMAL SUPPORTIVE CARE
e.g. analgesia and other comfort measures. This includes minimally invasive treatments (such as paracetamol) to improve symptom control/quality of life. **The patient's comfort should be the priority in determining care.**
Signature.....Date.....

Active Treatment usually includes:
Organ Support or High Dependency Unit if needed and appropriate (NIV, dialysis, inotropes, venous monitoring, cardioversion, etc.) and intensive care if needed and appropriate (intubation and ventilation, support of multi-organ failure, etc)

If you wish to provide guidance on specific interventions please do so below:

This patient is FOR attempted CARDIOPULMONARY RESUSCITATION
in the event of a cardiac arrest
Signature.....

This patient is NOT FOR attempted CARDIOPULMONARY RESUSCITATION
in the event of a cardiac arrest
Signature.....

This form is for review: NO / YES, at the following frequency.

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39/44

23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

Name	Signature	Date and Time	Designation
			ST3 or above (consultant to counsellor within 72 hours)
			Consultant
			Nurse informed
(Note: if the form is unfilled, unclear, unsigned or missing, the patient is FOR consideration of all active treatments including resuscitation)			

Universal Form of Treatment Options [UFTO] (verso)

Instructions for Review: Signature of Doctor overleaf indicates that this form is valid as at the time of signing.
If any alterations are made to original decisions, then please sign changes. If review boxes are full below, a new form must be started.

Note: This form may be temporarily revoked in the context of a procedure which may induce cardiac arrest eg pacing, angiogram, other (please specify).			
REVIEW has taken place on			
Date and time	Name	Signature	Designation

FREE TEXT for clinical team, patient and next of kin/lasting power of attorney, to include details (attaching relevant documents to the form where appropriate) of advance decisions, personal health plans, preferred priorities of care, and any other specific treatment(s) for which the patient does or does not wish to be considered, as well as details of discussions which have taken place.	Signature and Date

23/04/25, 15:43

Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

35. Em relação à Estratégia 14 "UFTO", como avalia:

Marcar apenas uma oval por linha.

	Não sei	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo	Concordo totalmente
Relevância	☐	☐	☐	☐	☐	☐
Aplicabilidade	☐	☐	☐	☐	☐	☐
Concordância	☐	☐	☐	☐	☐	☐

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Estratégias de apoio ao raciocínio clínico dos enfermeiros das Unidades de Cuidados Pós-Anestésicos: consenso de peritos

36. Comente ou sugira alterações à Estratégia 14 "UFTO" para a sua adequação em contexto clínico pós-anestésico.

A palavra ao Perito: estratégias adicionais

37. Sugere alguma estratégia adicional que não tenha sido aqui apresentada? Se sim, porque considera ser importante para o apoio ao raciocínio clínico no contexto pós-anestésico?

Este conteúdo não foi criado nem aprovado pela Google.

Google Formulários

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43/44