FACULDADE DE MEDICINA DENTÁRIA
UNIVERSIDADE DO PORTO

Knowledge and Attitudes of Dental Students Regarding the Prevention and Detection of Domestic Violence – a systematic review

Conhecimentos e atitudes dos estudantes de medicina dentária em relação à violência doméstica - uma revisão sistemática

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FACULDADE DE MEDICINA DENTÁRIA
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Research Monograph

Integrated Master`s Degree in Dental Medicine at the University of Porto

Knowledge and Attitudes of Dental Students Regarding the Prevention and Detection of Domestic Violence – a systematic review

Conhecimentos e atitudes dos estudantes de medicina dentária em relação à violência doméstica - uma revisão sistemática

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RESUMO

Introdução: A violência doméstica é um conceito comummente usado para se referir a um amplo conjunto de comportamentos abusivos, sejam eles físicos, sexuais, emocionais e financeiros dirigidos a pessoas que estão ou estiveram numa relação íntima. Está associada a múltiplas consequências adversas para a saúde, evidenciando o impacto multidimensional da violência doméstica para a saúde pública. Uma vez que a face é frequentemente alvo de agressões, os profissionais de saúde oral podem desempenhar um papel importante na identificação de casos de violência doméstica.

Objetivo: O principal objetivo desta revisão sistemática foi avaliar os conhecimentos e as atitudes dos estudantes de Medicina Dentária relativamente à identificação e gestão de casos de violência doméstica.

Métodos: Esta revisão sistemática foi conduzida de acordo com as diretrizes PRISMA (Preferred Reporting Items for Systematic and Meta-Analyses) e registada na plataforma PROSPERO, sob o código de registo CRD420261351771.

Foi realizada uma pesquisa abrangente da literatura nas bases de dados PubMed, Scopus, LILACS e Web of Science. Para responder ao objetivo desta revisão sistemática, foi formulada uma questão de investigação: “Quais são os níveis de preparação, conhecimento e atitudes dos estudantes de medicina dentária na identificação de casos de violência doméstica?” Esta questão foi estruturada segundo uma estratégia PICO modificada (PCO), em que P corresponde à população (estudantes de medicina dentária), C ao contexto (prevenção da violência doméstica) e O aos resultados (conhecimento e atitudes da população em estudo).

Os artigos foram importados para o software EndNote® 21 e as duplicações foram removidas. Os registos restantes foram analisados de acordo com os critérios de inclusão e exclusão previamente definidos. Os critérios de inclusão

abrangeram estudos que avaliassem os conhecimentos e/ou atitudes de estudantes de medicina dentária pré-graduados relativamente à identificação e/ou gestão de casos de violência doméstica. Foram incluídos estudos observacionais (transversais, longitudinais e caso-controlo) e estudos quase-experimentais exclusivamente com estudantes de medicina dentária. Adicionalmente, foram considerados estudos publicados em português, inglês ou espanhol, sem restrição quanto à data de publicação.
A avaliação da qualidade dos estudos observacionais incluídos foi realizada através da análise do risco de viés, utilizando a escala Newcastle-Ottawa e para o estudo quase-experimental foi utilizada a Lista de Verificação de Avaliação Crítica do Joanna Briggs Institute (JBI).

Resultados: A revisão sistemática permitiu selecionar 13 artigos que cumpriram todos os critérios de inclusão. Relativamente ao tipo de estudos, 12 eram estudos transversais e 1 era um estudo quase-experimental, sendo que todos utilizaram questionários compostos por perguntas abertas, de escolha múltipla e/ou de verdadeiro e falso, procedendo-se posteriormente à recolha das respostas. A análise dos artigos selecionados permitiu avaliar o nível de preparação dos estudantes de medicina dentária para reconhecer, gerir e reportar casos indicativos de violência em contexto clínico, bem como identificar potenciais lacunas na formação académica destes estudantes.

Conclusões: Os estudantes não se encontram suficientemente preparados para identificar casos de violência doméstica. Esta revisão sistemática evidencia a necessidade de integrar de forma mais consistente conteúdos relacionados com esta temática nos programas curriculares das faculdades de Medicina Dentária, promovendo o desenvolvimento de competências essenciais para a identificação e proteção das vítimas no contexto dos cuidados de saúde oral.

Palavras-chave: “Estudantes de medicina dentária”, “Violência doméstica”, “Medicina dentária forense”, “Abuso infantil”, “Abuso de idosos”, “Violência do parceiro íntimo” e “Violência interpessoal”.

ABSTRACT

Introduction: Domestic violence is a concept commonly used to refer to a broad range of abusive behaviours, physical, sexual, emotional and financial, directed at individuals who are or have been in an intimate relationship. It is associated with multiple adverse health outcomes, highlighting the multidimensional impact of domestic violence on public health. Since the face is often targeted in assaults, dental professionals can play an important role in identifying domestic violence.

Objective: The primary aim of this systematic review is to assess the knowledge and attitudes of Dental Medicine students regarding the identification and management of domestic violence cases.

Methods: This systematic review was conducted in accordance with PRISMA guidelines (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) and registered on the PROSPERO platform, under registration code CRD420261351771.

A comprehensive literature search was performed in PubMed, Scopus, LILACS, and Web of Science. To address the aim of this systematic review, a PICO (population, intervention, comparison, and outcomes) question was formulated: What are the levels of preparedness, knowledge, and attitudes of dental students in identifying cases of domestic violence? This question was structured using a modified PICO (PCO) strategy, where P refers to the population (dental students), C to the context (prevention of domestic violence), and O to the outcomes (knowledge and attitudes of the population under study).

The articles were imported into EndNote® 21 software and duplicate entries were removed. The remaining records were screened according to the predefined inclusion and exclusion criteria. The inclusion criteria were defined to include studies that assessed the knowledge and/or attitudes of undergraduate dental students regarding the identification and/or management of domestic violence cases. Observational studies (cross-sectional, longitudinal, and case-control) and quasi-experimental studies involving exclusively dental students were included.

Furthermore, studies published in Portuguese, English, or Spanish were considered, with no restrictions regarding publication date.
The quality assessment of the included observational studies was conducted through risk-of-bias analysis, using the Newcastle–Ottawa Scale and for the quasi-experimental study, the Joanna Briggs Institute (JBI) Critical Appraisal Checklist was used.

Results: This systematic review identified 13 articles that met all inclusion criteria. Regarding the study type, 12 were cross-sectional studies, and 1 was a quasi-experimental study. All studies used questionnaires that included open-ended, multiple-choice, and/or true-or-false items, and the answers were subsequently collected.
Analysing the selected articles allowed us to assess dental students' preparedness to recognise, manage, and report cases indicative of violence in the clinical setting, as well as identify potential gaps in students' academic training.

Conclusions: Students are not sufficiently prepared to detect cases of domestic violence. This systematic review emphasises the need to more consistently integrate domestic violence-related content into the curricula of Dental Medicine faculties, thereby promoting the development of competencies essential for the identification and protection of victims within the context of oral healthcare.

Key-Words: “Dental students”, “Domestic violence”, “Forensic dentistry”, “Child abuse”, “Elder abuse”, “Intimate partner violence” and “Interpersonal violence”.

INDEX

SCIENTIFIC PRODUCTION ..... *III*

ACKNOWLEDGEMENT ..... *IV*

RESUMO ..... *VI*

ABSTRACT ..... *VIII*

LIST OF ABBREVIATIONS ..... *XI*

LIST OF TABLES ..... *XI*

LIST OF FIGURES ..... *XI*

INTRODUTION *1*

METHODS *4*

Protocol and registration 4

Information sources and search strategy 4

Eligibility criteria 6

Selection process 7

Data extraction 8

Risk of bias assessment 8

RESULTS *9*

Study characteristics 9

Risk of bias within studies 11

Results of individual studies 12

DISCUSSION *19*

CONCLUSION *24*

BIBLIOGRAPHY *25*

LIST OF ABBREVIATIONS

DV: Domestic Violence

IPV: Interpersonal Violence

LIST OF TABLES

Table 1- Databases used and search strategy 5
Table 2*-Characterisation of the studies included in the systematic review* 10
Table 3-Analysis of the quality and risk of bias for each individual included study (Modified Newcastle-Ottawa Scale) 11
Table 4-Main findings of the studies included in the systematic review 16

LIST OF FIGURES

Figure 1-Workflow for inclusion and exclusion of studies 6
Figure 2- Workflow of the study selection process. 7

INTRODUTION

Domestic violence (DV), once considered a private problem, is now a prevalent public health issue that has multiple catastrophic effects on individuals, families, and the larger community [1-3]. According to the Health Organisation, violence involves the intentional use of physical force or power, threatened or actual, against oneself, another person, or a group or community, that either results in, or has a high likelihood of resulting in, injury, death, psychological harm, maldevelopment, or deprivation, underscoring the importance of early identification and intervention in these cases [4, 5].

Globally, an estimated one in three women and one in four men experience some form of domestic violence during their lifetime, with the burden disproportionately affecting low- and middle-income regions [6]. In Portugal, official data from the Commission for Citizenship and Gender Equality reflect a similarly persistent pattern, with 30,389 cases reported to law enforcement in 2022, the highest figure of the previous three years and a number likely shaped by both pandemic-related disruptions and improvements in reporting mechanisms [7-9]. The clinical relevance of these figures for dental practice is direct: published evidence indicates that between 65% and 75% of injuries sustained by victims of intimate partner violence occur in the head, face and neck region [10, 11]. This anatomical predominance places dental professionals in an unusually privileged position to identify early signs of abuse, a position rarely shared by other primary-care providers, who may have less frequent contact with patients or examine areas of the body less affected by these injuries. Beyond the physical lesions, domestic violence carries profound psychological and intergenerational consequences. Adult victims show elevated rates of depression, anxiety, post-traumatic stress and substance-use disorders [3]. At the same time, children exposed to a violent home environment exhibit impaired socio-emotional development and a higher risk of perpetuating violent behavioural patterns in adulthood [6].

Non-accidental physical injuries affect soft and hard tissues; in the orofacial region, the most common signs of previous trauma are hematomas, burns

caused by cigarettes, fractured or displaced teeth, teeth with mobility or multiple residual roots without justification and fractures in the maxilla and mandible [6].

An improper diagnosis carries tremendous consequences for the patient, their family and, since most injuries occur in the head and neck region, oral health care providers, such as dentists, are crucial to the screening and identification of individuals experiencing domestic violence [7-9, 12].

Although dentists can play a crucial role in preventing domestic violence, numerous studies worldwide indicate that dentists' level of knowledge and awareness of these issues, as well as their attitudes toward reporting cases, do not reflect the ideal role they should play in addressing this problem [13].

Compared to other health professions, dentists report lower rates of abuse. This difference becomes even more evident when compared with professions such as teaching, social work, law, and policing [10, 11].

In addition to the main reasons, such as a lack of general information, a lack of training, a feeling of unpreparedness, and a lack of recognition of their professional responsibilities, one of the primary factors for the low rates of case reporting by dentists is believed to be the type of training and content of dental school or university curricula [10].

Indeed, studies have shown that DV awareness and education in the dental curriculum are associated with a more positive attitude towards victims or a greater likelihood for practitioners to screen for DV injuries, particularly in cases of intimate partner violence (IPV) [14, 15].

Therefore, this topic must be addressed and integrated into the curricula of undergraduate dental courses, so that students are aware, informed, and properly prepared for the diagnosis and management of suspected cases that may arise in the academic context and, subsequently, in the exercise of their professional activity, since most of them tend to focus exclusively on the oral cavity during the patient examination [16, 17].

Although several primary studies have explored dental students' knowledge and attitudes regarding domestic violence in individual countries, to our knowledge, no systematic review has yet integrated this evidence across different educational and cultural contexts. The present systematic review therefore aims to: (i) characterise the knowledge, attitudes and perceived preparedness of undergraduate dental students regarding the identification and management of

domestic violence cases; and (ii) examine the extent to which dental curricula address these topics, to identify gaps that should be considered in future curricular reform.

METHODS

Protocol and registration

This review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)[18] checklist and registered on the PROSPERO website, CRD420261351771.

Information sources and search strategy

To fulfil the goal of this systematic review, a PICO (population, intervention, comparison, and outcomes) question was formulated: What are the levels of preparedness, knowledge, and attitudes of dental students in identifying cases of domestic violence? This question was formulated according to a modified PICO (PCO) strategy, where P refers to the population (dental students), C to the context (prevention of domestic violence), and O to the outcomes (knowledge and attitudes of the population under study).

The literature search was performed in four databases: PubMed, Scopus, LILACS, and Web of Science, with the following search queries listed in Table 1. Searches were conducted on September 10th, 2025. On March 4, 2026, the searches were repeated to update the search with papers published since the initial search.

***Table 1**- Databases used and search strategy*

DataBases	Search Strategy	Results
PubMed:	(("Dental Students"[MeSH] OR "Dental student*" OR "Dentistry student*" OR "Dental undergraduate*" OR "Dental trainee*" OR "Dental education" OR "Undergraduate dental education" OR "Oral health student*" OR "Future dentist*" OR "Dental school student*" OR "Health professional student*") AND ("Domestic violence"[MeSH] OR "Intimate Partner Violence"[MeSH] OR "Family violence"[MeSH] OR "Interpersonal violence" OR "Partner abuse" OR "Gender-based violence" OR "Child abuse"[MeSH] OR "Elder abuse"[MeSH] OR "Abuse" OR "Maltreatment" OR "Neglect" OR "Violence"[MeSH]) AND ("Knowledge"[MeSH] OR "Attitude"[MeSH] OR "Perception" OR "Awareness" OR "Preparedness" OR "Recognition" OR "Detection" OR "Response" OR "Competence" OR "Education" OR "Training" OR "Professional knowledge" OR "Practice" OR "Beliefs" OR "Experience") AND ("Forensic dentistry"[MeSH] OR "Forensic odontology" OR "Forensic medicine" OR "Forensic identification" OR "Abuse detection" OR "Reporting" OR "Diagnosis" OR "Victim identification"))	**91**
Web of Science:	(("dental student*" OR "dentistry student*" OR "oral health student*" OR "dental trainee*" OR "dental school student*") AND ("domestic violence" OR "intimate partner violence" OR "family violence" OR "child abuse" OR "elder abuse" OR "gender-based violence") AND ("screening skills" OR "identification skills" OR "clinical competence" OR "preparedness" OR "training" OR "curriculum" OR "educational intervention*" OR "self-efficacy" OR "knowledge" OR "awareness" OR "attitude*"))	**52**
Scopus:	(TITLE-ABS-KEY("dental student*" OR "dentistry student*" OR "dental undergraduate*" OR "dental trainee*" OR "dental education" OR "undergraduate dental education" OR "oral health student*" OR "future dentist*" OR "dental school student*" OR "health professional student*")) AND (TITLE-ABS-KEY("domestic violence" OR "intimate partner violence" OR "family violence" OR "interpersonal violence" OR "partner abuse" OR "gender-based violence" OR "child abuse" OR "elder abuse" OR "abuse" OR "maltreatment" OR "neglect" OR "violence")) AND (TITLE-ABS-KEY("knowledge" OR "attitude*" OR "perception" OR "awareness" OR "preparedness" OR "recognition" OR "detection" OR "response" OR "competence" OR "education" OR "training" OR "professional knowledge" OR "practice" OR "beliefs" OR "experience")) AND (TITLE-ABS-KEY("forensic dentistry" OR "forensic odontology" OR "forensic medicine" OR "forensic identification" OR "abuse detection" OR "reporting" OR "diagnosis" OR "victim identification"))	**95**
LILACS:	("dental student*" OR "dentistry student*" OR "dental undergraduate*" OR "dental trainee*" OR "dental education" OR "undergraduate dental education" OR "oral health student*" OR "future dentist*" OR "dental school student*" OR "health professional student*") AND ("domestic violence" OR "intimate partner violence" OR "family violence" OR "interpersonal violence" OR "partner abuse" OR "gender-based violence" OR "child abuse" OR "elder abuse" OR "abuse" OR "maltreatment" OR "neglect" OR "violence") AND ("knowledge" OR "attitude*" OR "perception" OR "awareness" OR "preparedness" OR "recognition" OR "detection" OR "response" OR "competence" OR "education" OR "training" OR "professional knowledge" OR "practice" OR "beliefs" OR "experience") AND ("forensic dentistry" OR "forensic odontology" OR "forensic medicine" OR "forensic identification" OR "abuse detection" OR "reporting" OR "diagnosis" OR "victim identification")	**9**

Eligibility criteria

Inclusion criteria included studies that assessed the knowledge and/or attitudes of undergraduate dental students regarding the identification and/or management of domestic violence cases. Eligible cases were observational studies (cross-sectional, longitudinal, and case-control) and quasi-experimental studies conducted exclusively with undergraduate dental students.

Studies published in Portuguese, English, or Spanish were included, with no restriction on publication date.

Exclusion criteria were the following: studies including other health professionals or students from other health disciplines (unless data for undergraduate dental students could be extracted separately); systematic reviews, narrative reviews, editorials, letters to the editor, comments, and case reports; studies with no full-text available; and studies with insufficient data for extraction or analysis.

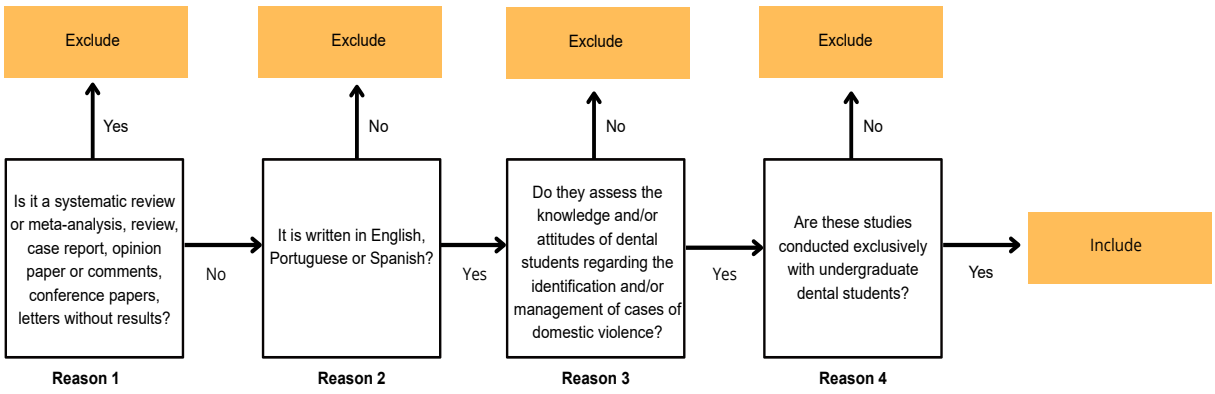

***Figure 1**-Workflow for inclusion and exclusion of studies*

Selection process

Bibliographic databases, including PubMed, Scopus, LILACS, and Web of Science, yielded a total of 247 articles, and the selection of studies is illustrated in Fig 2.

After retrieving all the publications, citation management software (EndNote® 21) was used to eliminate duplicates.

Two reviewers (FSD and MLP) independently examined the titles and abstracts of the publications retrieved after duplicates were removed. The same reviewers conducted a full-text analysis of the 26 studies retained after title and abstract screening. Any discrepancies were resolved through discussions with a third party (IMC).

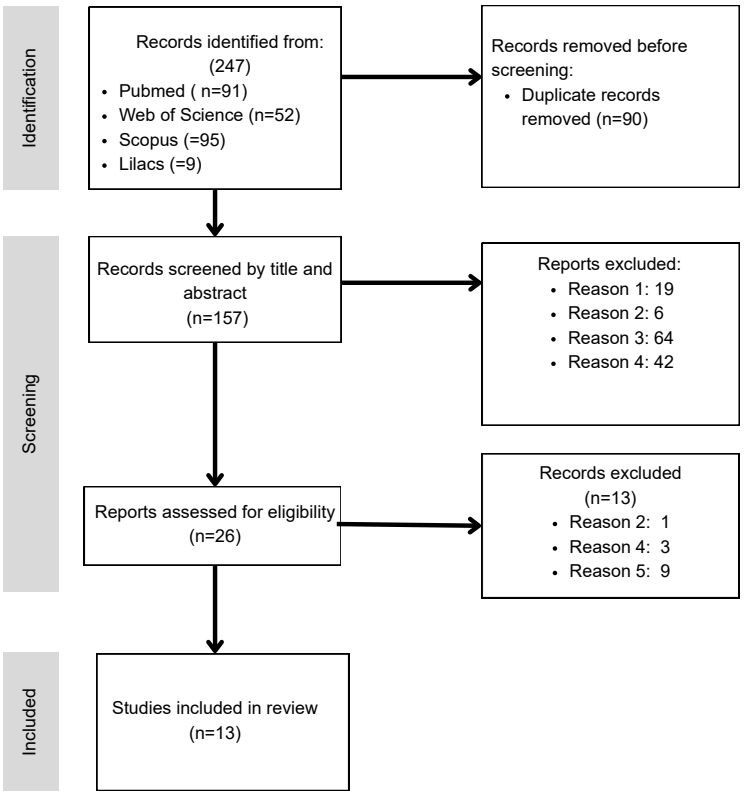

***Figure 2**- Workflow of the study selection process.*

Reason 1: Systematic reviews and Meta-analyses, Reviews, Case Reports, Opinion papers or comments, Conference papers and Letters without results; **Reason 2**: Not written in English, Portuguese or Spanish; **Reason 3**: Studies that do not assess the knowledge and/or attitudes of dental students regarding the identification and/or management of cases of domestic violence; **Reason 4:** Studies not conducted exclusively with undergraduate dental students; **Reason 5:** Full text available.

Data extraction

The eligible articles were read in full, and their data were extracted in a standardised manner. The information extracted and recorded from the studies was: authorship, year of publication, the country in which the study was developed, sample size, sex of the dental students, the students' level of clinical experience, the data collection method, the results regarding the perception, knowledge and attitude of dental students towards victims of domestic violence in a consultation context, the level of education and preparedness they received regarding domestic violence and their interest in participating in further training programmes.

Risk of bias assessment

All included studies underwent independent quality assessment by two reviewers (FSD and MLP). Disagreements were resolved by discussion, and when consensus could not be reached, a third reviewer (IMC) was consulted. Quality was assessed using different tools, depending on each study's methodological design.

For cross-sectional studies, the Newcastle-Ottawa Quality Assessment Scale[19, 20] was used. The maximum points per section were 5 for "Selection", 2 for "Comparability", and 3 for "Outcomes". In the "Comparability" section, a new option was added for studies that did not investigate potential confounders. Two reviewers (FSD and MLP) independently assessed the risk of bias and categorised it as "high" (0-4 points), "medium" (5-7 points) or "low" (8-9 points). A third author (IMC) resolved any inconsistencies in the RoB assessment through discussion.

The risk of bias of the quasi-experimental study was assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Quasi-Experimental Studies [21], which comprises 9 items rated as 'yes', 'no', 'unclear' or 'not applicable'. Each item was scored as 'yes' (1 point), 'no' or 'unclear' (0 points); 'not applicable' items were excluded from the denominator. The methodological quality of the study was

classified, based on the proportion of items rated 'yes', as low quality (<50%), moderate quality (50–69%) or high quality (≥70%) [22].

RESULTS

Study characteristics

A total of thirteen studies were included, with dental students from different universities worldwide representing different academic years and educational stages. The characteristics of the included studies are presented in Table 2.

Of the thirteen studies, ten address child abuse and neglect [9],[10],[23],[24],[25],[26],[27],[28],[29],[30], two focus on interpersonal violence [31],[32] and one is about forensic dentistry [33]. All thirteen articles used questionnaires that included open-ended, multiple-choice, and true-or-false items to assess dental students' knowledge, attitudes, and perceptions regarding domestic violence.

A total of twelve quantitative cross-sectional studies[9, 10, 23-30, 32, 33], were conducted across Germany[10], Saudi Arabia[23], Republic of North Macedonia [24], Brazil [25], United Arab Emirates [10], Croatia [26], India [27], USA [28-32], Bulgaria [30] and Cyprus [33]. These studies utilised surveys to gather data on students` perceptions, attitudes, knowledge, awareness and prior experience, including the sources of their information. Analytical approaches included statistical tests.

Furthermore, a quasi-experimental study [31] conducted in the USA involved dental students who completed pre- and post-surveys following an educational workshop. Data were collected using questionnaires designed to assess students` knowledge, awareness and beliefs regarding IPV before and after the instructional session. The workshop provided an overview of IPV/DV, outlined appropriate responses to disclosures, available resources, institutional regulations and relevant legal reporting requirements.

Eight articles included only undergraduate dental students [9, 10, 23-26, 30, 31]. In one study, the sample comprised paediatric dentists, general dentists and dental students. Another study included both dental students and oral hygiene students [28]. In a different study, the sample consisted of general dentists, oral hygienists, dental students, and oral hygiene students [29]. One study involved students from

dentistry, nursing, medicine and social work [32]. Finally, another article included dental students as well as full-time and part-time faculty members [33].

***Table 2**-Characterisation of the studies included in the systematic review*

Authorship and Year	Country	Sample Size	Experience Dental Students	Interview method	Type of study	K	At	Aw
Articles about child abuse and neglect								
Al-Ani A et al.[10] 2021	Germany	T=181 F=112 M=69	3rd,4th,5th years dental students	Questionnaire	Cross-sectional	Yes	No	No
Al-Mutairi, M. et al.[23] 2023	Saudi Arabia	T=75 F=37 M=38	2nd,5th year dental students	Survey	Cross-sectional	No	No	Yes
Ambarkova, V. et al.[24] 2023	Republic of North Macedonia	T=163 F=117 M=46	6th year dental students	Questionnaire	Cross-sectional	Yes	Yes	No
Castro, M. J. C. et al.[25] 2025	Brazil	T=107 M= 23 F=84	Undergraduate dental students	Questionnaire	Cross-sectional	Yes	No	No
Hashim, R. et al.[9] 2013	United Arab Emirates	T=578 M=135 F=443	4th,5th dental students	Questionnaire	Cross-sectional	Yes	Yes	No
Jordan, A. et al.[26] 2021	Croatia	T=544 M=153 F=391	Undergraduate dental students	Questionnaire	Cross-sectional	Yes	No	No
Sampangi, A. B. et al.[27] 2023	India	T=100 M=34 F=66	Undergraduate dental students	Questionnaire	Cross-sectional	No	No	Yes
Thomas, J. E. et al.[28] 2006	USA	T= 233 M=49,8% F=50,2%	Undergraduate dental students	Questionnaire	Cross-sectional	Yes	No	No
Thomas, J. E. et al.[29] 2006	USA	T=233 M=50% F=50%	Undergraduate dental students	Survey	Cross-sectional	Yes	No	No
Ivanoff, C. S.et al.[30] 2023	USA and Bulgaria	T=281 M=90 F=191	Undergraduate dental students	Survey	Cross-sectional	Yes	No	Yes
Articles about interpersonal violence								
Buchanan, C. et al.[31] 2021	USA	T=245 F=85 M=145	1st year dental student	Survey	Quasi-experimental	Yes	No	Yes
Connor, P. D. et al.[32] 2011	USA	T=61	Undergraduate dental students	Survey	Cross-sectional	Yes	Yes	No
Articles about forensic odontology								
Giannakopoulos, K. et al.[33] 2023	Cyprus	T=304 M=129 F=172 Prefer not to say=3	Undergraduate dental students	Survey	Cross-sectional	Yes	Yes	No

K: Knowledge; **At:** Attitude; **Aw:** Awareness.

Risk of bias within studies

Risk of bias and quality assessment of the included studies are presented in Table 3. Scores ranged from 3 [29] to 8 [23, 32], with two studies being classified as having low quality [29, 30], nine studies moderate quality [9, 10, 24-28, 31, 33], and two studies high quality [23, 32].

The quasi-experimental study by Buchanan et al. [31] was appraised using the JBI Critical Appraisal Checklist for Quasi-Experimental Studies and scored 5/9 (≈ 56%), indicating moderate methodological quality. The main weaknesses were the absence of a control group, the single pre/post measurement without longer-term follow-up, and incomplete reporting of the psychometric properties of the survey instrument.

***Table 3**-Analysis of the quality and risk of bias for each individual included study (Modified Newcastle-Ottawa Scale)*

Author	Selection				Comparability	Results		Total	Risk of bias
	Q1	Q2	Q3	Q4	Q5	Q6	Q7		
Al-Ani A et al[10] 2021.	*	*	*	*		*	*	6/10	Moderate
Al-Mutairi, M. et al[23] 2023.	*	*	*	**	*	*	*	8/10	Low
Ambarkova, V. et al[24] 2023.	*		*	*		*	*	5/10	Moderate
Castro, M. J. C. et al[25] 2025.	*	*	*	*		*	*	6/10	Moderate
Hashim, R. et al[9] 2013.	*	*	*	**		*		6/10	Moderate
Jordan, A. et al[26] 2021.	*		*	*	*	*	*	6/10	Moderate
Sampangi, A. B. et al[27] 2023.			*	*	*	*	*	5/10	Moderate
Thomas, J. E. et al[28] 2006.	*	*	*	**		*	*	7/10	Moderate
Thomas, J. E. et al[29] 2006.	*			*		*		3/10	High
Ivanoff, C. S.et al[30] 2023.	*			*	*	*		4/10	High

Table 3-Analysis of the quality and risk of bias for each individual included study (Modified Newcastle-Ottawa Scale)-continued

Author	Selection				Comparability	Results		Total	Risk of bias
	Q1	Q2	Q3	Q4	Q5	Q6	Q7		
Buchanan, C. et al[31] 2021.	*	*	*	*	*	*	*	7/10	Moderate
Connor, P. D. et al[32] 2011.	*	*	*	**	*	*	*	8/10	Low
Giannakopoulos, K. et al[33] 2023.	*	*	*	*		*	*	6/10	Moderate

Q1: Representativeness of the sample; **Q2:** Sample size; **Q3:** Participants who did not respond; **Q4:** Exposure verification; Q5: Comparability; **Q6**: Evaluation of results; **Q7:** Statistical analysis. Scores, 0-4: high risk of bias; 5-7: medium risk of bias; 8-10: low risk of bias.

Results of individual studies

Table 4 presents the main findings of the 13 articles included in this systematic review. The parameters extracted, listed in the first column, concern students' perceptions, specifically, whether they consider themselves capable of detecting signs of abuse, and their attitudes, focusing on whether they have ever identified indicative signs of such situations.

The second column addresses students' knowledge, namely whether they understand the concept of domestic violence, whether they are aware that dentists are legally obliged to report suspected cases and whether they know where such reports should be made. It is evident that, depending on the studies analysed, differences exist in this knowledge across academic years.

The third column presents students' experience, particularly whether they have received any education or training on the subject to feel competent to make a diagnosis, and the primary source through which this knowledge was acquired.

Of the ten articles addressing child abuse and neglect, only five reported students' perceptions and attitudes toward this topic, revealing considerable variability in students' experiences throughout their academic training.

In the study by Al-Mutairi et al.[23], approximately 17.23% of students reported witnessing a case during their academic journey. Similarly, Castro et al. [25] found

that 21.5% of students identified suspicious signs during their training. Ambarkova et al.[24] reported that a considerable proportion of participants (69.94%) demonstrated confidence in their ability to recognise abuse situations. However, in contrast to these findings, Sampangi et al. [27] showed that, despite suspicion or confirmation of cases, none of the students proceeded to report them to the relevant authorities.

Regarding students' knowledge of their legal obligation to report cases of child abuse and neglect, results ranged from 61% to 98%, with lower values reported in Castro et al. [25] at 39% and in Ivanoff et al. [30], particularly within the Bulgarian subgroup, at 48.9%.

The differences in responses between sexes observed in the study by Al-Mutairi et al. [23] were not pronounced, with no statistically significant differences between groups (p=0.813). In Jordan et al.[26], the percentage of students recognising the obligation to report suspected child abuse increased from 48.3% in the second year to 70.5% in the third year. Similarly, awareness of the legal consequences of failing to report also increased from 46.0% to 70.5%.

Regarding where to report or file such cases, the percentages of correct responses ranged from 36.2% to 79%, highlighting considerable heterogeneity in participants' knowledge levels. In Ambarkova et al.[24], 107 students (65.64%) demonstrated awareness of where to report such cases. However, the majority did not know the appropriate procedural steps, with a statistically significant difference observed (p=0.002). In Jordan et al. [26], knowledge regarding the competent authorities for reporting increased from 44.8% to 69.3% between the second and third academic years. Castro et al.[25] is particularly noteworthy, presenting a markedly low value of 0.93%.

Regarding the definition of child abuse and neglect, both Ambarkova et al. [24] and Castro et al. [25] found that the majority of students demonstrated knowledge of the concept, indicating an adequate understanding of the issue. Ambarkova et al.[24] also demonstrated progression across academic years, with an increase in the number of students who reported knowing the appropriate steps to follow when abuse is suspected (p=0.002). In contrast, Ivanoff et al.[30] reported substantial variation among the analysed groups. Within the USA group, out of 56 surveys, only 10 participants (17.8%) correctly identified three or more types

of abuse as defined by the Federal Child Abuse Prevention and Treatment Act. In contrast, in the Bulgarian group, only 31.6% answered correctly.

The finding demonstrates a consistent pattern regarding the recognition of facial bruising as an indicator of physical aggression. In Al-Ani et al.[10], 50.8% of students recognised that bruising in the facial region may be associated with aggressive behaviours such as slapping or facial grabbing. Similarly, in Hashim et al. [9], 85.8% identified this association, whereas in Ambarkova et al. [24], this proportion was 82.21%.

Regarding the location of bruises, in Al-Ani et al. [10] 55.2% of participants correctly identified that additional bruises tend to occur over bony prominences. Likewise, in Hashim et al. [9], more than half of the students (52.8%) disagreed with the association between cervical bruising and accidental trauma, demonstrating some degree of clinical discernment. However, in Ambarkova et al.[24] only 37.42% correctly recognised that such lesions are not typically associated with accidental trauma.

About bite marks, 77.5% of students in Hashim et al. [9] and 59.51% in Ambarkova et al. [24] considered them to be a possible indicator of abuse.

In Ivanoff et al.[30], in terms of physical abuse, bruising emerged as the most frequently identified physical sign, with other indicators including bone fractures, bite marks and dental injuries. Additionally, behavioural manifestations such as social withdrawal, lack of eye contact and anxiety were highlighted, alongside factors associated with neglect, including poor oral hygiene and malnutrition. Consistently, in Ambarkova et al.[24] 68.71% of students recognised poor oral health as a component of physical neglect.

In Jordan et al. [26], statistically significant differences in knowledge progression across academic years were observed. Identification of signs associated with sexual abuse, such as seductive behaviours or oral lesions, increased markedly between the first and sixth year, reaching values of 58.6% and 84.5%, respectively ($p<0.001$). A similar pattern was evident in physical abuse, with recognition of burns increasing from 46.8% to 77.6% ($p<0.001$) and awareness of the importance of investigating bite marks increasing from 51.6% to 77.6% ($p=0.007$). It was also observed that only 44.9% of students correctly identified the correlation between dental and physical neglect ($p<0.001$).

Regarding education on child abuse during dental training, the majority of students reported not having received any preparation or education on the topic, as evidenced in studies by Al-Ani et al. [10], Al-Mutairi et al. [23] and Sampangi et al. [27].

In relation to sources of information, in Al-Ani et al.[10] 85.3% of students reported social media as their primary source of knowledge. Conversely, in Thomas et al. [27], Castro et al. [25] and Ivanoff et al. [30], the majority of students identified dental school as their principal source of information.

Regarding progression throughout academic training, exposure to child abuse-related content increased significantly in later academic years. In Al-Mutairi et al.[23], only 14% of second-year students reported having received training on the topic, compared with 96.9% of fifth-year students. In Jordan et al. [26], only 33.6% of students reported exposure to the subject during their degree, with this percentage substantially lower in earlier years, such as the second year (1.2%), and considerably higher in later years, particularly the sixth year (79.3%).

Regarding studies on interpersonal violence and forensic dentistry, Buchanan et al.[31] found that most students reported never having received specific training on interpersonal violence (IPV). Similarly, Connor et al.[32] reported that most participants did not feel adequately prepared to diagnose and identify situations of IPV. Furthermore, this study demonstrated that 57% of students received between one and five hours of teaching on the topic, while 36% stated that they had received no specific training.

Finally, Giannakopoulos et al.[33] reported that the majority of students demonstrated reduced knowledge of forensic dentistry. Moreover, a statistically significant difference was observed between female and male students in their interest in participating in workshops and additional training on the subject, with female students showing a greater willingness to participate.

Table 4-*Main findings of the studies included in the systematic review*

Author (year)	Perception	Knowledge	Experience
Literature on the child abuse and neglect			
Al-Ani et al. (2021)	------	131 (72,4%) responded positively when asked whether a dentist was legally required to report cases of child abuse and neglect. In the question regarding where to report, 143 (79%) selected the "Children Protection Department". Reporting to "the local police" was the option selected by almost half of the 90 students (49,7%).	When asked whether they had ever received any type of information, instructions, or training on the subject, 12 students responded positively (6,6%), while 169 did not (93,4%). Only 2,8% of the students considered their dental school as the main source of knowledge on child abuse. Most of the students responded negatively (N=173, 95,6%), when asked if they had received enough formal training that could qualify them to diagnose and report child abuse and neglect properly, while only eight students responded positively (4,4%).
Al-Mutairi et al. (2023)	Approximately 17 (23%) dental students have witnessed a case of child abuse and neglect throughout their time as students.	30 male students (78,9%) considered that, as future professionals, they have a role in the topic, while 7 were unsure (18,42%) and only 1 (2,6%) believed they do not. Among female students, 29 (78,4%) responded "yes", 6 "I do not know" (16,22%) and 2 (5,4%) believed they do not have a role. However, no statistically significant difference was found between male and female students (p=0.813). The majority of the second year (69,8%) and the fifth year (90,6%) selected yes, with no statistically significant difference, p= 0.071.	When asked about the source of information on the topic 64 (85.3%) students responded social media. Regarding perceptions of dental school as a source of information on the subject a highly significant difference was observed between second-year students (6; 14.0%) and fifth-year students (31; 96.9%) (p=0.000).However, no statistically significant difference was found between male (20;52,6%) and female students (17;45.9%) (p=0.563).When asked to rate the quality of the academic courses, the majority of students, 22 males (57.89%) and 15 females (40.54%) rated them as "fair" on a scale ranging from "excellent" to "insufficient", with no statistically significant difference observed (p=0.147).A similar trend was seen across academic years, with 23 second year students (53.4%) and 14 fifth students (43.75%) selecting "fair". When asked about their interest in learning more about the topic,34 male students (89.5%) responded positively, compared to 32 female students (86.5%) with no statistically significant difference (p=0.461). In addition, 37 2nd year students (86.0%) expressed interest in learning more about the topic along with 29th year students (90.6%).
Ambarkova et al. (2023)	A total of 114 students (69.94%) considered that they would be able to identify abuse.	A total of 125 (76.69%) students were aware of what dental neglect is, and 159 (97.53%) knew that dentists are required to report cases of abuse. 107 (65.64%) students knew where to report such cases, however the majority did not know the appropriate steps to take when reporting their suspicions, with statistically significant difference, p=0.002	129 (79.14%) students reported never been trained on what child abuse is and a total of 130 (79.75%) answered that they had not received any information on how to recognize and diagnose a possible case of abuse during their university education.149 (91.41%) would like to receive additional training.
Castro et al. (2025)	21.5% of students stated having already identified signs or suspicions of abuse during their academic training	All students 100% reported being aware of what child abuse is. Additionally, 39% of students stated that they knew dentists are mandatory reporters. However, only 34.58% reported knowing what a notification form, and 38.32% stated that they were familiar with the referral process in suspected cases. The most notable gap was in identifying where to report, with only 0.93% responding affirmatively.	Only 10,3% reported having received any type of training on the topic. Most responded to the proposal of lectures or elective courses, and 65.4% believe that the best way to address the topic would be through its structured inclusion in Paediatric Dentistry discipline.
Hashim et al. (2013)	------	Most dental students (506; 87.5%) reported that they were legally required to report child abuse cases. When asked where they would report child abuse, only 209 students (36.2%) knew where to report child abuse. Around a quarter of the students (139; 24.0%) said that they did not know the answer. 465 students (80.4%), agreed that dentists should be legally mandated to report abuse cases.	Most of the students (114; 77%) considered their dental school to be the main source of knowledge on child abuse. 528 respondents (91.2%) indicated that they did not receive enough formal training in recognition and reporting child abuse.

Table 4-*Main findings of the studies included in the systematic review-continued*

Jordan et al. (2012)	------	A total of 61% over the academic years answered correctly when asked whether a dentist is required to report suspected child neglect or sexual abuse. When asked where a dental medicine doctor can file a report only 58.6% answered correctly, with statistically significant difference, p=0.014. 58% knew the correct answer when asked about the consequences if a dentist does not report a suspected case, with a statistically significant difference, p<0.001.	Only 33.6% came across the topic in the faculty.
Sampangi Ramegowda et al. (2023)	Seven students reported suspected cases and only one reported a confirmed case, but none of them reported to concerned authorities.	------	------
Thomas et al. (2006)	----------	7.7% of the senior dental students defined abuse correctly, while 78.3% of the senior dental students gave a partially correct response when they were asked to define abuse. Approximately 20% of senior dental students were not able to define dental neglect. When asked about their legal responsibilities, 67.8% of students answered correctly. When asked where they would report child abuse/neglect, only 17.6% of the dental students knew where to report child abuse.	By the end of the final year of the dental programs, all students reported that they had learned about child abuse/ neglect in the classroom setting.
Thomas et al. (2006)	98% of the dental students had never reported a case of child abuse.	For questions concerning sexual abuse 74% answered correctly, for physical abuse 54% and for questions concerning the diagnosis of child abuse 77% got the correct answers. The highest percentage of correct responses was for the question of when to report child abuse, with 68% of dental students answering correctly (p<0.01). When asked where to report child abuse and neglect, 18% of dental students answered appropriately, p<0.001.	When asked about the sources from which the students had obtained of information about child abuse, 73% reported that they had received information from their dental program.
Ivanoff et al. (2023)	**------**	Usa: 54 students understood that at a minimum, they need to report SCAN as soon as possible. Only one student answered incorrectly. Bulgaria: Regarding the definition of child abuse/neglect, 31.6% answered the question correctly. 110 students (48.9%) indicated that they needed to report it and 115 students (51.1%) left the answer blank or answered the question incorrectly.	USA: 38 (67.8%) believed they learned about the topic in a classroom setting, while 12 (21.4%) indicated a clinical setting and 6 (10.7%) indicated both. Only one student (1.8%) indicated that an external rotation was the source of exposure to the topic. Bulgaria: Seven percent of students (n = 16) reported learning about the theme in class, 1.77% (n = 4) in a clinical setting, and 20.88% (n = 47) during an external rotation. The majority, 70.22% (n = 158), indicated that they had not learned at all. Additionally, 93.77% of respondents (n = 211) reported receiving zero hours of SCAN training in their curriculum (Q4), and 99.55% (n = 224) indicated that no specific course covered SCAN content.

Table 4-*Main findings of the studies included in the systematic review-continued*

Literature on interpersonal violence			
Buchanan et al. (2021)	------	Students were unaware of specific resources, referral procedures or other pertinent materials (18.1%). A detailed analysis by sex revealed these deficiencies were not sex-specific.	The majority of respondents (64%) indicated no previous IPV-specific education , with a minority of students (36%) reporting some previous educational experience. 71.1% of the NO previous IPV education responses were from males, which was not statistically significant, p=0.1229.
Connor et al. (2011)	These dental students generally did not perceive themselves as either well prepared to address IPV with patients or knowledgeable about IPV.	31.6% reported that they were aware of state reporting requirements regarding IPV. The female dental students reported a mean Actual Knowledge score of 22.2 and the male students reported a mean of 22.0.	When students were asked whether they had received IPV training, 57% reported having between one and five hours of training, while 5.0% indicated between six and fifteen hours and 2.0% reported more than fifteen hours. Additionally, over one-third of the students (36.0%) stated that they had not received any IPV training during dental school.
Literature on forensic odontology			
Giannakopoulos et al. (2023)	-------	Students (86.5%) had no knowledge about forensic odontology.	“Are you interested in participating in workshops and seminars in forensic odontology?” statistically and significantly more positive answers were noted from females, with p less than 0.001.

DISCUSSION

The evidence gathered in this systematic review supports the notion that dental students are well-positioned to identify signs of abuse and neglect, owing to their regular patient contact and clinical focus on the head, face, and neck regions, which are among the most frequently affected. Despite this advantage, however, considerable deficiencies persist in students' knowledge, attitudes, and clinical experience on the subject.

Regarding students' knowledge of the definition of violence, the results indicate that, in general, the majority can correctly identify and understand the concept, demonstrating a relatively consistent theoretical foundation in this area.

Nevertheless, this conceptual knowledge is not proportionally reflected across other dimensions, as considerable heterogeneity is observed regarding the understanding of legal obligations to report suspected abuse cases, with values ranging from 39% to 98% and particularly lower percentages identified in certain contexts, such as in the studies by Castro et al.[25] and in the Bulgarian subgroup of Ivanoff et al.[30]

Even more evidently, knowledge concerning reporting procedures appears insufficient in most studies. Although between 36.2% and 79% of students reported knowing where to report suspected cases, a significant proportion remained unaware of the specific procedural steps involved in the notification process. These findings suggest that theoretical knowledge alone is insufficient to guarantee appropriate action, as understanding the concept does not necessarily imply mastery of legal responsibilities or the capacity to respond correctly in a real clinical situation.

Regarding the progression of knowledge throughout academic training, the data suggest a gradual improvement as students advance through their years of education. Studies such as those by Jordan et al. [26] demonstrate a consistent increase in the identification of abuse signs and in the recognition of legal obligations among early- and late-year students, reinforcing the positive influence of academic exposure to the topic.

The analysis of clinical signs of abuse and neglect indicates that certain physical indicators, such as facial bruising, are relatively well recognised by students with high percentages reported in studies such as Hashim et al.[9] and Ambarkova et al.[24]. However, other more subtle signs or those associated with neglect, such as poor oral hygiene or lesion patterns in different anatomical locations, demonstrate lower levels of recognition. This limitation may compromise the ability to detect clinical cases early.

Despite this progression, existing gaps in academic training remain unresolved. The findings demonstrate that most students did not receive structured education on abuse and neglect during their degree programmes. When the topic was addressed, the approach was generally perceived as ineffective. In the studies by Al-Mutairi et al. [23], Hashim et al. [9] and Al-Ani et al. [10], a broadly consistent perception emerged among students that the academic training received in abuse and neglect was insufficient. In Al-Mutairi's[23] study, most participants classified the quality of the educational content delivered as "fair", reflecting a moderate assessment of its adequacy, with no statistically significant differences between sexes or academic years. Similarly, in Al-Ani's[10] study, when questioned about whether formal education was sufficient to prepare them to diagnose and report child abuse cases, the overwhelming majority responded negatively, demonstrating a clear perception of inadequacy in the training received. Despite this perception, students demonstrated a strong interest in expanding their knowledge in this field, with more than 85% expressing a willingness to pursue further education. These findings therefore reinforce the notion that, although students recognise the importance of the subject, current training is perceived as insufficient, ineffective and incapable of adequately preparing them for clinical practice. This strong interest in further education was also evident in the studies by Al-Mutairi et al. [23] and Ambarkova et al.[24]. Similarly, Giannakopoulos et al. [33] also reported a statistically significant difference between female and male students regarding their interest in participating in workshops and additional training on the subject. This difference may be explained by the fact that domestic violence disproportionately affects women, making female students potentially more aware of its impact and more motivated to acquire further knowledge and training in this area.

Most students reported never having identified cases of child sexual abuse throughout their academic journey. This finding may be explained by limited clinical exposure to real abuse situations during undergraduate training, difficulties in recognising less evident signs and insecurity in assuming suspicion without adequate practical preparation. Furthermore, insufficient theoretical education on how to proceed also contributes to uncertainty in the reporting process, leading students to feel inadequately prepared or confident to communicate suspected situations to the relevant authorities.

In this context, the study by Sampangi et al.[27] notably demonstrated that, despite the emergence of suspicion or confirmed cases, none of the students proceeded to formal reporting, thereby reinforcing the significant gap between problem identification and concrete action. Thus, the absence of structured theoretical and practical education results in limitations in the clinical application of knowledge and a diminished ability to identify and report such cases.

Consequently, despite the progression of theoretical knowledge throughout the course, the findings suggest that clinical experience and practical competence remain insufficient to ensure consistent and appropriate action.

These results reinforce the need to adjust academic training to respond to the interest demonstrated by students and improve their preparation for the identification and management of abuse and neglect cases. Accordingly, the findings of this review suggest that although abuse and neglect are progressively being integrated into dental curricula, important deficits persist in practical training, legal literacy and students' preparedness to act appropriately. This reality highlights the need to strengthen more structured pedagogical approaches based on clinical simulation, enabling the development not only of theoretical knowledge but also of practical and communication skills.

The methodological quality of the included studies, assessed through the Newcastle–Ottawa Scale adapted for cross-sectional studies and the JBI Critical Appraisal Checklist for Quasi-Experimental Studies, was generally limited. Most cross-sectional studies scored low in the comparability domain because they did not adjust for potential confounders, such as academic year, prior exposure to formal training, or gender. Therefore, the findings reported here should be interpreted with caution and considered descriptive rather than explanatory. Furthermore, the reliance on self-administered questionnaires introduces a non-

negligible risk of social desirability bias, particularly when students are asked to report on their own knowledge and attitudes. Future studies should employ validated instruments, adjust for relevant covariates and, where possible, complement self-report data with objective measures of clinical competence. These findings should be interpreted in the broader context of the existing literature on practising dental professionals. Previous studies [13, 14] with qualified dentists have similarly identified low rates of detection and reporting of domestic violence, suggesting that the deficits observed at the undergraduate level persist into clinical practice. Indeed, Love et al. [15] documented this gap more than two decades ago, and the recent review by Levin et al. [34] confirms that the response of dental professionals to domestic violence victims continues to fall short. Although the integration of domestic violence content into undergraduate medical and nursing curricula has received increasing attention in recent decades [35] training in dental education appears to lag behind. This discrepancy may help to explain the persistently lower rates of suspected-case reporting by dentists relative to other healthcare professionals and reinforces the urgency of addressing the topic at the earliest stages of professional training.

The principal limitations of this review relate firstly to the scarcity of evidence-based studies specifically addressing the relationship between dental students and elder abuse and neglect, as most of the literature focuses predominantly on child abuse and violence against women. In addition, many studies grouped variables such as sex and academic year in the same analysis, which prevents a clear assessment of how each factor individually influences students' knowledge and attitudes.

Regarding strengths, the consistently high participation rates across most included studies are noteworthy, reflecting students' interest in this subject. Furthermore, the use of questionnaires as a data collection instrument offers several advantages, including low cost, the ability to encompass large sample sizes, standardisation of questions and response options and the guarantee of participant anonymity, thereby contributing to the reliability of the data obtained.

Several priorities for future research emerge from this review. First, the development and international validation of a standardised questionnaire on dental students' knowledge and attitudes regarding domestic violence would enable meaningful cross-country comparisons and, ultimately, quantitative

synthesis. Second, longitudinal studies are needed to evaluate the retention of knowledge throughout dental training and into early professional practice. Third, well-designed intervention studies, ideally with control groups and pre/post assessments, should be conducted to evaluate the effectiveness of specific pedagogical strategies, including clinical simulation, standardised patients and case-based learning. Finally, evidence on intimate partner violence and, particularly, on elder abuse remains scarce in the dental education literature; these areas should be prioritised in future work.

CONCLUSION

Dental students appear to be insufficiently prepared to identify situations of domestic violence or to fulfil their associated legal responsibilities in such cases adequately. Although dental school curricula include content on the topic, it is necessary to increase the time dedicated to domestic violence and adopt more active, practical pedagogical approaches, such as analysing and discussing clinical cases, conducting thematic seminars, and participating in lectures alongside other healthcare professionals. These strategies could better prepare students to act with greater confidence, thereby providing a more reassuring experience for victims and promoting safer, more informed, and more responsible clinical practice, while reducing the risk of omissions or inappropriate conduct.

It is also recommended that dental schools establish specific clinical guidelines and protocols for suspected cases of domestic violence. The clinical documentation of head and neck lesions in these contexts should be encouraged to enable students to access images of different patients, facilitating the recognition of patterns and the anatomical regions most frequently affected.

Likewise, it would be beneficial for dental schools to establish partnerships with DV victim support institutions, as this type of clinical exposure would allow students closer contact with real cases, thereby enhancing awareness and sensitivity toward the issue. Furthermore, it would be valuable for dental schools to develop a compulsory, independent curricular unit on abuse and neglect before the start of the clinical years.

Finally, consideration may also be given to integrating dentists into emergency care teams within the National Health Service to strengthen the multidisciplinary response capacity for victims of violence.

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