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MESTRADO EM MEDICINA LEGAL

Fatores psicossociais de risco e de proteção de burnout nos agentes da polícia – uma revisão sistemática da literatura

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Abstract

Background

Burnout in security forces is a concerning problem. If not taken seriously, it may result in adverse outcomes for the individual, the organisation and the beneficiaries of their services. However, the specific factors that may influence burnout levels in police officers are not yet clear. Therefore, the objective of this study was to identify the psychosocial risk and protective factors associated with burnout syndrome among police officers.

Methods

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA). A protocol was developed and registered in PROSPERO (CRD42022290022). A search strategy was applied to Medline via OvidSP, PsycInfo, Scopus and Web of Science. The screening process of the retrieved publications was divided into two phases, conducted by two researchers and supervised by two others. The quality assessment entailed the use of the CASP checklist for cohort studies. The data was reported through a narrative synthesis.

Results

A total of 904 articles were retrieved in the initial literature search. After systematically removing studies based on the exclusion and inclusion criteria 41 studies were included in this review. All studies were cross-sectional (k=40) except one that had a longitudinal design. The total number of study participants was 16,017. The sample sizes ranged from 50 to 1794 with a mean age of 36.55 years (SD=8.95) (based on available data k=23). The most used instrument to measure burnout was the MBI (Maslach Burnout Inventory). All studies had high to moderate quality. Factors like heavy workload, lack of recognition, lack of control, lack of fairness, low social support, role conflicts, role ambiguity, lack of leadership, operational stress, neuroticism, negative emotions and maladaptive coping strategies such as avoidance are significant risk factors for burnout in police officers, whereas social support, health-oriented leadership, psychological hardiness, personality traits such as agreeableness, extroversion and openness to new experiences, active and problem-focused coping strategies, and physical exercise are protective factors.

Conclusions

Burnout, despite being strictly defined as a phenomenon of the occupational context, is also influenced by factors outside of this domain. Still, future research should focus on confirming

the associations found here with more robust designs and more attention must be paid to police officers' mental health by investing in the development of strategies to mitigate the adverse factors and maximise the effects of the protective factors.

Keywords

Burnout, Police officers, Psychosocial factors, Risk factors, Protective factors, Systematic review, Mental health, Occupational health.

RESUMO

Contexto

O Burnout nas forças de segurança é um problema preocupante. Se não for levado a sério, pode conduzir a efeitos adversos para o indivíduo, para a organização e para os beneficiários dos seus serviços. Todavia, os fatores específicos que poderão influenciar os níveis de burnout dos agentes da polícia ainda não são claros. Como tal, o objetivo deste estudo foi identificar os fatores psicossociais de risco e de proteção associados à síndrome de burnout entre os agentes da polícia.

Métodos

Esta revisão sistemática foi elaborada de acordo com as diretrizes do *Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA)*. Um protocolo foi elaborado e registado na plataforma *PROSPERO* (CRD42022290022). Uma estratégia de pesquisa foi aplicada nas bases de dados *Medline via OvidSP*, *PsycInfo*, *Scopus* e *Web of Science*. O processo de triagem dos estudos obtidos foi dividido em duas fases, levadas a cabo por dois investigadores e supervisionadas por outros dois. A avaliação de qualidade foi feita através da *CASP checklist* para estudos longitudinais. Os dados foram reportados através de uma síntese narrativa.

Resultados

Um total de 904 estudos foram obtidos na pesquisa inicial. Após uma eliminação sistemática com base nos critérios de inclusão e exclusão, 41 estudos foram incluídos nesta revisão. Todos os estudos eram transversais ($k=40$), à exceção de um que possuía um desenho longitudinal. O número total de participantes nesta revisão foi de 16.017 indivíduos. O tamanho das amostras variou entre 50 e 1794 indivíduos com uma idade média de 36,55 anos ($DP=8,95$) (com base nos dados disponíveis $k=23$). O instrumento mais utilizado para medir os níveis de burnout foi o MBI (*Maslach Burnout Inventory*). Todos os estudos tinham uma qualidade entre alta e moderada. Fatores como a carga laboral, falta de reconhecimento, baixo controlo, falta de justiça, baixo apoio social, conflitos e ambiguidade de papéis, falta de liderança, stress operacional, neuroticismo, emoções negativas e estratégias de *coping* desadaptativas, tais como evitamento, são fatores de risco significativos para o burnout nos polícias, enquanto que ter apoio social, liderança orientada para a saúde e bem-estar, resiliência psicológica, traços de personalidade como amabilidade, extroversão e abertura a novas experiências, estratégias de *coping* ativas e

direcionadas para a resolução do problema, e a prática de atividade física são fatores protetores.

Conclusões

O burnout apesar de ser definido como um fenômeno exclusivo do contexto laboral, é também influenciado por fatores fora deste domínio. Ainda assim, investigações futuras devem concentrar-se em confirmar as associações encontradas nesta revisão através de estudos mais robustos e prestar mais atenção à saúde mental dos agentes da polícia, investindo no desenvolvimento de estratégias para mitigar os fatores adversos e maximizar os efeitos dos fatores protetores.

Palavras-chave

Burnout, Polícias, Fatores psicossociais, Fatores de risco, Fatores de proteção, Revisão sistemática, Saúde mental, Saúde ocupacional

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Introduction

Since times immemorial, work is an essential part of a human's life as it represents a way for needs fulfilling, personal growth and evolution.¹ People tend to look for a rewarding, meaningful and stable work-life.² However, lack of recognition, lack of control, role ambiguity, interpersonal conflicts, and changes in the organisational structure are some examples of difficulties that are part of the occupational daily life and, if not managed well, may result in stressful situations affecting the worker's well-being, personal lifestyle and job performance.²⁻⁵

The term *burnout*, emerged in the mid-1970s by Freudenberger⁶ and gained momentum shortly afterwards through Christina Maslach's research.⁷ In 2019, the World Health Organization (WHO) recognised burnout as an occupational phenomenon and included it in the 11th Revision of the International Classification of Diseases (ICD-11),⁸ as a syndrome resulting from chronic workplace stress that has not been successfully managed and that can be characterized by three core dimensions: (i) feelings of energy depletion or exhaustion; (ii) increased mental distance or cynical attitudes towards co-workers and service users; and (iii) feelings of reduced professional efficacy or reduced personal accomplishment.⁸⁻¹⁰

Human-service professionals were the first group of workers where burnout was observed.^{6,7,9} The review conducted by Schaufeli and Enzmann¹¹ from 1978 to 1996 revealed that burnout was primarily examined in human-service professions, namely healthcare providers (33.8%), teaching professions (26.6%), social workers (7%) and law enforcement (2%). However, this dominance does not necessarily mean that burnout plays a more significant role in human service professions compared to other occupational sectors,^{11,12} but still, it is very characteristic of the helping professions to be directly exposed to problematic people, chronic emotional stress and high professional demands, which contributes to a greater vulnerability to burnout.¹³

In our society, it is the police who hold the power and duty to enforce laws, preserve the peace, prevent crimes, protect civil rights and liberties and provide services to the community in which they are inserted.¹⁴ It is of utmost importance that, to maintain and secure these interests, police officers are in the best possible state of their physical and mental health. For many police officers, the tasks associated with their type of work can be exhausting and debilitating as they remain in constant surveillance and are often exposed to violent and traumatic scenarios.^{15,16} In addition, police officers still have to deal with organisational aspects that, for being perceived as oppressive and unnecessary, represent

a great source of stress for these professionals.^{17,18} A systematic review investigating the risk factors for stress among police officers reported that officers who worked in big cities were more prone to higher levels of stress and post-traumatic stress disorder as they were more frequently exposed to violent and extreme situations.¹⁹ Negative work-related conditions such as increased working hours, increased workloads, work-family conflicts, and a negative work environment were also associated with increased levels of stress.¹⁹

Police activity is, thus, described in the literature as stressful, leading to poor physical and mental health outcomes over time, in which burnout is included.^{18,20} In the United States of America, the prevalence of two of the core dimensions of burnout (i.e., emotional exhaustion and depersonalisation) were investigated in a sample of 13,000 police officers from across 89 police agencies,²¹ describing that 19% of the sample felt emotionally exhausted on a weekly basis and 13% had severe levels of depersonalisation. In Sweden,²² in a sample of 856 patrolling police officers 28% reported high levels of emotional exhaustion and 56% increased levels of depersonalisation. In Spain, in a sample of 747 officers from the National Police, 32% also revealed high levels of burnout.²³

The consequences for police officers who suffer from chronic workplace stress are numerous and can affect their personal integrity and that of others.²⁴ Literature shows that burnout can lead to suicidal behaviours,²⁵ triggering aggressive attitudes and excessive use of force towards civilians,²⁶ worse job performance,¹³ turnover intention²⁷ and several physical and psychological outcomes such as cardiovascular diseases, musculoskeletal pain, prolonged fatigue, depressive symptoms, insomnia and use of antidepressant treatment.²⁸

It is, therefore, necessary to go beyond stress and understand the occupational phenomenon of burnout in depth, raising awareness of the risks among policymakers and police departments, and providing more information and pathways for research, prevention strategies and interventions. The main objective of this systematic review of the literature is to contribute to ameliorating this problem by identifying which psychosocial risk and protective factors are associated with the development of burnout syndrome among police officers.

Methods

Search strategy

This study is a systematic review of the literature and it was conducted according to the guidelines established by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA).²⁹ A protocol based on the PICO framework³⁰ was developed to

establish the methods and plan of action used in this study and was registered in the PROSPERO database for public consultation (CRD42022290022).³¹ The following electronic databases were searched for peer-reviewed relevant studies: Medline (via OVID SP); APA PsycInfo; Scopus, and Web of Science; until Dec 20, 2021. No timeline restrictions or other filters were used.

The search terms used were refined through a series of initial searches in all four databases to find similar terms and test the use of truncation “*”, and wildcards “?” increasing this way its sensitivity. The final search strategy used was as follows: (“burnout” OR “burn out” OR “emotion* exhaust*” OR “energy depletion” OR “nervous exhaust*” OR “nervous breakdown” OR “mental* collaps*” OR “psychological cris*” OR “depersonali*” OR “cynicism” OR “personal accomplishment” OR “professional effic*”) AND (“police*” OR “law enforcement*” OR “cops”) AND (“psychosocial*” OR “risk factor*” OR “protective factor*” OR “protection factor*” OR “social support” OR “group support” OR “imbalance” OR “effort-reward” OR “overcommitment” OR “lack of control” OR “work demand*” OR “job demand*” OR “material resource*” OR “police culture” OR “organi?ational culture” OR “emotional intelligence” OR “career opportunit*” OR “job opportunit*” OR “psychological resilienc*” OR “hardiness”).

Inclusion and exclusion criteria

Studies to be included would have to a) examine samples composed of police officers actively working in full exercise of their duties and b) report outcomes of interest (relationships between risk and protective factors with burnout). Studies that a) did not include primary data; b) did not present a quantitative design; c) had samples composed of mixed populations (i.e. police officers and other professionals) and treated data as a whole; d) reported the partial use of questionnaire items to measure burnout and its dimensions; e) used a burnout definition rather divergent from the WHO's definition; and f) were conducted based on big-scale events (e.g., COVID-19, terrorism, natural catastrophes, etc.), were excluded. No language restrictions were applied as long as the studies had an abstract in English.

Screening procedures

The search results were exported into the reference manager software Endnote X20. Duplicates were excluded. Two main reviewers (LAI and LAB) screened the studies independently by title and abstracts. Any disagreements found were solved upon discussion

with two additional researchers (MPC and EP). Full texts were then accessed and assessed according to the selection criteria.

Data analysis and quality assessment

Data extracted consisted of study identification (authors and year of publication); study aims; the country where the study was conducted; population characteristics (age, sex, professional experience); police officers' sample size; study design; burnout measurement tool used; and outcomes of interest. Two authors (LAI and LAb) independently performed the quality assessment of the studies using an adapted version of the CASP Checklist for Cohort studies.³² The CASP checklist comprises fourteen questions assessing bias related to the aim of the research; sample recruitment; suitable methodology; confounding variables; participants' follow-up; validity of the results; generalizability; and clinical relevance. Of the fourteen questions, twelve are answered with "Yes"; "Can't Tell" or "No". The two questions regarding participants' follow-up were not rated in studies with a cross-sectional design. This tool does not offer a global scoring system for quality assessment.³² A narrative synthesis of data was carried out following the Guidance on the Conduct of Narrative Synthesis in Systematic Reviews.³³ The synthesis framework consists of a textual approach in which an initial description of the studies' characteristics is made and then explores the relationships within and between studies. The review findings were separately grouped by factor type (i.e., socio-demographic, organisational, operational, social interactions, individual and coping strategies).

Results

The search resulted in a total of 904 records, of which 274 were duplicates and therefore excluded. The remaining 630 records went through a first screening phase based on the title and abstract and 548 records were excluded. Full texts of 82 records were screened and 41 were finally included in the review. The PRISMA flow chart reflects the study selection process (Fig. 1.).

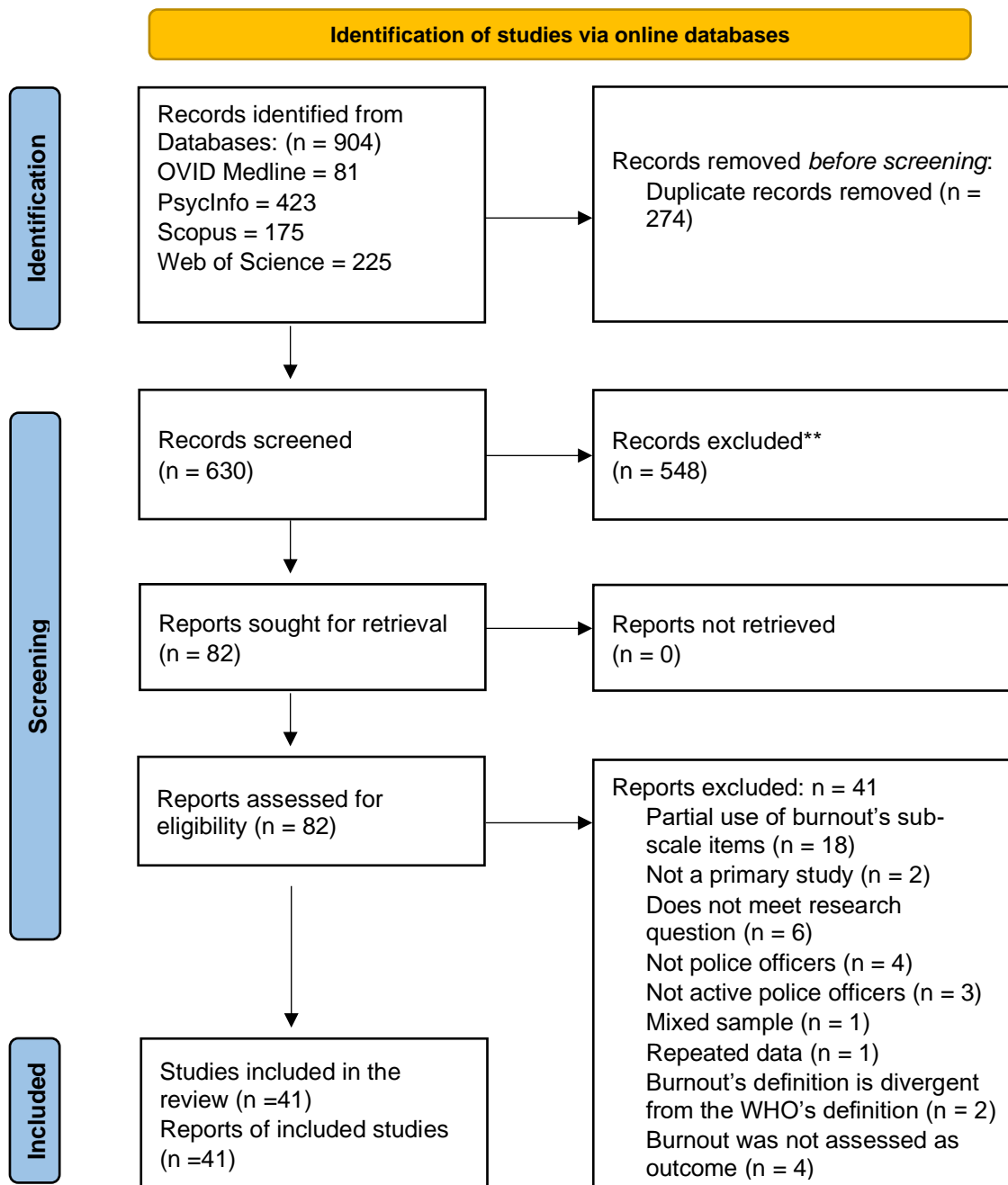


Figure. 1 - PRISMA flow diagram of the screening procedure via online databases

The quality assessment of the included studies based on the CASP checklist can be found in Appendix 1. The majority of the studies had strong to moderate quality.

A summary table containing the characteristics of the included studies can be found in Table 1. The studies were published between the years of 1991 and 2021 and were conducted in the USA (k=9), Norway (k=5), Poland (k=4), China (k=3), Spain (k=3), India (k=2), Mexico (k=2), Netherlands (k=2), Sweden (k=2), Ukraine (k=2), Brazil (k=1), Chile (k=1), Germany (k=1), Italy (k=1), South Africa (k=1), Taiwan (k=1) and Turkey (k=1). All studies were cross-sectional (k=40) except one that had a longitudinal design. The total number of study participants was 16,017, the sample sizes ranged from 50 to 1794, and

the percentage of female officers ranged from 0% to 44% with three studies including only men. This review's sample has a mean age of 36.55 years with a standard deviation of 8.95 years (based on available data from k=23). The most common instruments used to measure burnout were the Maslach Burnout Inventory – Human Services Survey (MBI-HSS)³⁴ and the General Survey version (MBI-GS).³⁴ MBI-HSS was used in 19 studies (46%), MBI-GS was used in 13 studies (32%), followed by the Oldenburg Burnout Inventory (OLBI)³⁵ that was used in four (10%), Professional Quality of Life version V (ProQOL-V)³⁶ (5%), Copenhagen Burnout Inventory (CBI)³⁷ (5%) in two studies each, and Spanish Burnout Inventory (SBI) in one study (2%).³⁸

Table 1 - Summary table with the characteristics of the included studies.

Author, year	Country	Design	Sample characteristics	Sample size	Burnout scale	Findings
Backteman-Erlanson et al. (2013)	Sweden	Cross-sectional	Patrol Officers; 437 women (56%) and 419 men (53%); Mean age of 34 (SD=6.9) and 39 (SD=10.7) years for women and men, respectively.	N = 856	Swedish version of the MBI translated and validated by (Hallsten, 1985).	Men had higher depersonalisation (DP). Sex showed no significance with emotional exhaustion (EE). Age and years of experience showed negative correlation only with DP. High demands; lack of decision latitude; social support; organisational culture and organisational climate showed positive correlation with both MBI subscales. Leadership was only negatively correlated with EE.
Baka (2015)	Poland	Cross-sectional	The group of participants consisted of 124 (20%) women and 483 (80%) men, aged between 21 and 61 years; Mean age of 36.64 (SD=7.81); Work experience among the participants ranged from 1 to 36 years.	N = 607	OLBI	Interpersonal conflicts, organisational constraints and workload showed a significant relationship with job burnout.
Bakker & Heuven (2006)	Netherlands	Cross-sectional	65 men (64%) and 36 women (36%); Their age ranged from 20 to 58 years with an average of 35 years (SD = 8.04); Mean organisational tenure was 5 years (SD =0.96).	N = 101	MBI-GS	Emotional dissonance and emotional demands showed positive correlations with exhaustion and cynicism.
Baruch-Feldman et al. (2002)	USA	Cross-sectional	Traffic police officers; 92 men and 119 women; Mean age of 35.4 years (range 21-62 years).	N = 211	MBI	Age showed a negative correlation with burnout. Sex did not show any significant correlation. Family support and Unit supervisor support were negatively correlated with burnout. Immediate supervisor and co-worker support did not show any significance. Trait anger was positively correlated with burnout.

Note – MBI-HSS (Maslach Burnout Inventory – Human Service Survey); MBI-GS (Maslach Burnout Inventory – General Survey); OLBI (Oldenburg Burnout Inventory); CBI (Copenhagen Burnout Inventory); ProQOL-V (Professional Quality of Life Questionnaire – version V); SBI (Spanish Burnout Inventory).

Author, year	Country	Design	Sample characteristics	Sample size	Burnout scale	Findings
Basinska et al. (2014)	Poland	Cross-sectional	15% women (N = 29); Mean of professional experience was 14.6 years (SD = 5.0, range 5 to 28 years).	N = 169	OLBI	Acute fatigue was positively correlated with exhaustion and disengagement. Low-arousal negative emotions (sadness) partially mediated the relationship between acute fatigue and exhaustion. Low-arousal positive emotions were not significant (calm). High-arousal positive emotions (enthusiasm) and high-arousal negative emotions (anxiety) also partially mediated.
Bawa & Kaur (2011)	India	Cross-sectional	Average job experience of 24.6 years; Mean age of 48 years old (SD=6.08) and ranged from 25 to 56 years old with a mean of 48 years.	N = 150	MBI	Role overload, role conflict, unreasonable group and political pressures, responsibility for persons, under participation, intrinsic impoverishment, strenuous working conditions and occupational stress were positively correlated with exhaustion. Role ambiguity, powerlessness, poor peer relations, low status, unprofitability, designation, age and education did not show significance. Under participation was the only factor positively correlated with low personal accomplishment. No variables showed significance concerning depersonalisation. Role overload, role conflict, unrealistic group and political pressures, responsibility for people, under participation, strenuous working conditions and occupational stress showed positive correlations with overall burnout. The remaining factors did not show significant correlations.
Beltran et al. (2009)	Mexico	Cross-sectional	Traffic Police officers; 802 (91.6%) were men while 73 (8.4%) were women; 36% were between 30-39 years old and 27% between 40-49 years old.	N = 875	MBI-HSS	The frequency and satisfaction of work-related social support increased the risk of burnout. The frequency and satisfaction of family-related social support increased the risk of burnout.
Brady (2017)	USA	Cross-sectional	Internet Crimes Against Children Personnel; 72% male; Age ranging from 40-49 (40.6%); 47.5% were within their first 5 years in the ICAC task forces.	N=433	ProQOL-V	Home life support (family) and the use of positive coping strategies showed a negative correlation with burnout. Low organisational support, feeling overwhelmed and frequent indirect exposure to crimes against children were positively correlated with burnout. Sex, the number of children and the number of weekly hours working ICE cases were positively correlated with burnout. Trauma history, spiritual coping, age of child victim and working undercover did not show significant correlations with burnout.

Note – MBI-HSS (Maslach Burnout Inventory – Human Service Survey); MBI-GS (Maslach Burnout Inventory – General Survey); OLBI (Oldenburg Burnout Inventory); CBI (Copenhagen Burnout Inventory); ProQOL-V (Professional Quality of Life Questionnaire – version V); SBI (Spanish Burnout Inventory).

Author, year	Country	Design	Sample characteristics	Sample size	Burnout scale	Findings
Burke & Mikkelsen (2006)	Norway	Cross-sectional	84% were male; 73% worked in urban areas; 39% held tenure of 21 years or more; 42% had 46 years old or more.	N=766	MBI-GS	Working in urban environment, high workload and emotional demands increased exhaustion. Social support and a bigger sense of community decreased exhaustion. Bigger department sizes decreased cynicism. Longer tenure, lower social support, role conflict, less information, more quantitative demands and fewer cognitive demands increased cynicism. Being men and having greater cognitive demands, social support and sense of community increased professional efficacy. Working continuous shift-work decreased professional efficacy.
Burke et al. (2006)	Norway	Cross-sectional	78% male; 46% worked in urban areas; 54% worked 11 years or more; 72% were in non-management jobs. >61% had 31 to 50 years of age.	N=221	MBI-GS	No difference was found among male or female police officers in relation to burnout dimensions.
De la Fuente et al. (2013)	Spain	Cross-sectional	88.2% were male; Mean age of 35.7 years (SD=8.33); 54% had partner; 54.8% had at least one child;	N=747	Spanish Version of MBI was used adapted by Seisedos (1997)	Having partner increased exhaustion, depersonalisation and decreased personal accomplishment. Having children decreased personal accomplishment. Being older and having more years of service decreased personal accomplishment. Age, sex, number of children, level of studies, work post and rank were not related to exhaustion or depersonalisation. Working rotating shift-work was positively associated with exhaustion and depersonalisation. Regarding Personality variables: only openness correlated with personal accomplishment. Neuroticism and low agreeableness increased exhaustion and depersonalisation. Agreeableness, conscientiousness and extraversion increased personal accomplishment.
Dudek et al. (2001)	Poland	Cross-sectional	96.2% male; Mean age of 32 years old (SD=5.7); Average tenure of 9.6 years.	N = 160	MBI	Sense of control was significantly increased exhaustion, depersonalisation and decreased personal accomplishment.

Note – MBI-HSS (Maslach Burnout Inventory – Human Service Survey); MBI-GS (Maslach Burnout Inventory – General Survey); OLBI (Oldenburg Burnout Inventory); CBI (Copenhagen Burnout Inventory); ProQOL-V (Professional Quality of Life Questionnaire – version V); SBI (Spanish Burnout Inventory).

Author, year	Country	Design	Sample characteristics	Sample size	Burnout scale	Findings
Durán et al. (2006)	Spain	Cross-sectional	89.2% are men; Average age of 38 years old (SD=10); Average job tenure of 13.2 years.	N=232	Spanish Version of MBI by Seisedos (1997).	Active coping style was only negatively associated with DP Sex and marital status were not associated with any burnout component. Officers between 6-15 years of service reported higher levels of EE and DP and lower levels of PA. Avoidance coping style increased burnout, and job tenure decreased it. Sex and marital status showed no significance.
Euwema et al. (2004)	Netherlands	Multi-method study (Survey and field observations).	83% male; Mean age of 32.7 years (SD=7.7); Average work experience was 13.9 years;	N=358	Dutch version of MBI-HSS by Schaufeli & Van Dierendonck (2000)	Job demands and rewards imbalance (lack of reciprocity) showed positive correlatiopns with EE and DP.
Farfán et al. (2019)	Spain	Cross-sectional	75.95% male and 24.05% women; Mean age of 37.72 years old; Job tenure average was 14.04 years.	N=237	MBI-GS spanish version by Gil-Monte (2007)	Lack of social support was positively correlated with EE and DP, and negatively correlated with PA. Neuroticism was also positively correlated with EE and DP, and negatively correlated with PA.
Fedorenko et al. (2020)	Ukraine	Cross-sectional	Criminal police officers; Two groups based on lenght of service (46.2% had 3 months tenure and 53.8% had 5-15 years tenure).	N = 65	Russian validated version of MBI by N. Vodopyanova and O. Starchenkova (2009)	Comparisons between two groups of police officers composed according to the lenght of service were made. In the first group of officers (3 month) coping strategies of social contact were associated with EE; manipulative actions with EE and DP; avoidance with PA and distancing with overall burnout. The mechanisms of defence objection and projection were negatively associated with EE, substitution with DP, and no relation was found for PA. In the second group of officers (5-15 years), assertive actions, impulsive actions and avoidance were associated with EE; Self-control and positive reevaluation with DP; Distancing and agressive actions with PA. The mechanisms of defence objection was positively related to DP, and rationalisation was negatively related to it. No relation was showed for EE and PA.

Note – MBI-HSS (Maslach Burnout Inventory – Human Service Survey); MBI-GS (Maslach Burnout Inventory – General Survey); OLBI (Oldenburg Burnout Inventory); CBI (Copenhagen Burnout Inventory); ProQOL-V (Professional Quality of Life Questionnaire – version V); SBI (Spanish Burnout Inventory).

Author, year	Country	Design	Sample characteristics	Sample size	Burnout scale	Findings
Fyhn et al. (2016)	Norway	Cross-sectional	Police Investigators; 59% men; Mean age was 41.4 years (SD=7.8).	N=156	MBI-GS	Age, police experience and sex showed no association with burnout. Marital status and social support showed positive and negative relationship with burnout, respectively. Meaningfulness was negatively correlated with burnout. Hardiness (commitment) showed a negative association with burnout. The other two dimensions of psychological hardiness (control and challenge) did not show an association.
Garbarino et al. (2013)	Italy	Cross-sectional	Police Special Force Unit ("VI Reparto Mobile"); 289 men; 48.4% held the rank of superintendent or technical staff; Mean age of 35.4 years (SD=7.5); Average length of service of 14 years.	N=289	MBI Italian version by Sirigatti and Stefanile (1993)	Rank showed a negative relationship with EE, length of employment showed a negative relationship with EE, children revealed a negative relationship with DP; the remaining socio-demographic variables showed no significance (education, marital status). Emotional stability was negatively associated with EE and DP, agreeableness was negatively related with DP. All personality variables were positively related with PA. Demands, effort and overcommitment were positively associated with EE. Reward was negatively associated with EE. Control, social support and reward showed a negative association with DP. Higher effort and overcommitment were positively associated with DP. Only control was positively associated with PA. All the other occupational stress variables were not significant.
Garcia-Rivera et al. (2020)	Mexico	Cross-sectional	Municipal Police Officers; 87% men and 13% women; Age between 23 to 42 years old; 34.8% of 2 to 5 years, 58.7% have job tenure of 6 to 10 years and the remaining of 11 to 15 years.	N=276	SBI	Officers who engage in sports activities have lower mental exhaustion than those who do not. Being male is associated with higher levels of mental exhaustion. Officers with daily operational stressors also had higher mental exhaustion and guilt scores than officers with occasional operational stressors. There were no differences found in relation to officers marital status and recreational activities participation.
Hills & Norvell et al. (1991)	USA	Cross-sectional	Highway patrol officers; 100% men; Mean age was 33.6 years old (SD=8.16); Job tenure of 8.02 years.	N=234	MBI	Neuroticism was significant and positively associated with EE. From the independent variables (Perceived stress scale, Daily hassles scale, Police stress scale) only perceived stress scale was associated with increased burnout.

Note – MBI-HSS (Maslach Burnout Inventory – Human Service Survey); MBI-GS (Maslach Burnout Inventory – General Survey); OLB (Oldenburg Burnout Inventory); CBI (Copenhagen Burnout Inventory); ProQOL-V (Professional Quality of Life Questionnaire – version V); SBI (Spanish Burnout Inventory).

Author, year	Country	Design	Sample characteristics	Sample size	Burnout scale	Findings
Hu et al. (2016)	China	Cross-sectional	401 males and 65 females; Mean age of 36.76 (SD = 9.82).	N=466	MBI-GS chinese version by Hu and Schaufeli (2011)	Workload, mental demands, physical demands, supervisor support, colleague support, <i>renqing</i> reward and <i>renqing</i> investment showed positive correlations with exhaustion and cynicism. Job control and participation in decision showed negative correlations with exhaustion and cynicism. Job demands and guanxi exchange were positively associated with burnout. Having social resources was not associated with burnout. Task resources was negatively associated with burnout.
Hu et al. (2017)	China	Longitudinal	Mean age of 36.0 (SD = 9.2) years; 239 = males and 37 = female.	N = 466 (First stage; year 2012) N = 273 (Second stage; year 2013)	Chinese version MBI-GS (Hu & Schaufeli, 2011)	Chronic exposure to high and low job demands was associated with an increase in burnout; Chronic exposure to high job resources was associated with a decrease in burnout; Chronic exposure to low job resources was not associated with an increase in burnout; Increased exposure to job demands and job resources was associated with an increase and a decrease in burnout, respectively; Decreased exposure to job demands was not associated with a decrease in burnout; Decreased exposure to job resources was associated with an increased burnout; Chronic exposure to low job resources in a high-demands environment was associated with an increase in burnout; Chronic exposure to high job resources in a high-demands environment was not associated with a decrease in burnout; Increased and decreased exposure to job resources in a high-demands environment is associated with a decrease and an increase in burnout;
Kepple (2018)	USA	Cross-sectional	85.8% (n=103) male and 14.2% as female (n=17); Mean age of 37.9 years old (ranging 21-62); Average of 10 years of experience (ranging 1-33 years).	N = 120	OLBI	Organisational and operational stress were positively associated with burnout. Trait mindfulness was negatively associated with burnout.
Kula (2017)	Turkey	Cross-sectional	92.6% were men; The largest group of officer (n=158) had 15 years of service.	N=538	CBI	Organisational and operational stress were positively related to burnout. Supervisor support was not directly associated with burnout.

Note – MBI-HSS (Maslach Burnout Inventory – Human Service Survey); MBI-GS (Maslach Burnout Inventory – General Survey); OLBI (Oldenburg Burnout Inventory); CBI (Copenhagen Burnout Inventory); ProQOL-V (Professional Quality of Life Questionnaire – version V); SBI (Spanish Burnout Inventory).

Author, year	Country	Design	Sample characteristics	Sample size	Burnout scale	Findings
Kumar & Kamalanabhan (2017)	India	Cross-sectional	Inspectors and sub-inspectors; 81.7% male; the majority (43%) aged between 31 and 39 years;	N=491	MBI	Role ambiguity, work support, work overload, inflexible working hours, perceived unfairness, work-family conflict and family-work conflict, were associated to all three burnout dimensions. Political interference and Public interaction were not associated with burnout.
Martinussen et al. (2007)	Norway	Cross-sectional	173 men, 48 women and 2 not reported; 28% had management responsibilities; Mean age was 36.8 years (SD=8.3); Average work experience was 11.5 years.	N=223	MBI-GS	Sex was not associated with burnout. Exhaustion was the only burnout dimension that showed a significant relationship with age. Positive correlations were found between exhaustion and work conflict and work-family pressure. Autonomy and social support were negatively correlated. Overtime work was not significant. Regarding cynicism, leadership, autonomy and social support showed negative correlations. Positive correlations were found with work conflict and work-family pressure and burnout. Overtime work was not significant. Only work conflict and work-family pressure were negatively correlated with professional efficacy. Leadership and overtime work were not significant. Autonomy and social support were positively correlated with professional efficacy.
Medina (2007)	USA	Cross-sectional	Patrol officers; 89% male and 11% female; Age ranged from 30-41 years; Tenure ranged from 6 to 10 years.	N = 132	MBI	Race was only related to depersonalisation. Age was related to exhaustion and personal accomplishment. Sex, education, marital status and shift hours were not associated with burnout. Operational stress and organisational stress were positively correlated with burnout. 16 Personality factors: Warmth; emotional stability; social boldness; openness to change; were negatively related with EE and DP; Vigilance, apprehension, self-reliance and tension were positively related to EE and DP (with exception of apprehension). Warmth; emotional stability; liveliness; social boldness and openness to change were positively related with PA, vigilance, privacy, self-reliance and tension were negatively related. Big Five: Extraversion and agreeableness were negatively related to EE and DP and anxiety was positively related. Extraversion, independence, agreeableness were positively related to PA and neuroticism was negatively related. Confrontative coping, accepting a lot of responsibility, or avoiding organisational and operational stressors increased EE. Not seeking social support, use confrontative coping, avoid organisational or operational stressors increased DP Seeking social support and not avoiding organisational or operational stressors, increased PA
Mella & Boutin (2013)	Chile	Cross-sectional	100% male; Age ranged from 20 to 49 years; Job tenure ranged from 1 to 29 years; 1 to 14 (60.9%) and 15 to 29 year (39.1%).	N=338	MBI	Age and marital status showed no association with burnout. Focusing on emotions, mental disengagement and seeking social support were associated with EE. (social support was the only to show a negative direction) The same coping strategies showed associations with personal accomplishment. (social support was the only to show a positive direction).

Note – MBI-HSS (Maslach Burnout Inventory – Human Service Survey); MBI-GS (Maslach Burnout Inventory – General Survey); OLBI (Oldenburg Burnout Inventory); CBI (Copenhagen Burnout Inventory); ProQOL-V (Professional Quality of Life Questionnaire – version V); SBI (Spanish Burnout Inventory).

Author, year	Country	Design	Sample characteristics	Sample size	Burnout scale	Findings
Mike (2021)	USA	Cross-sectional	87.2% male and 12.8% females; Age ranges from 21 to 60+ years.	N = 195	MBI	Emotional intelligence components were significantly associated with burnout dimensions Only two constructs of EI (use of emotions and emotions regulation) revealed a significant negative effect in EE. Only others appraisal, use of emotions and emotions regulation showed a positive effect in PA Only emotion regulation showed a significant negative effect in DP
Miller et al. (2017)	USA	Cross-sectional	85.4% were male; 71.4% married; Age between the ages of 19 and 73 years old and a mean age of 43 years old; Job tenure of 15.8 years ranging from 0 to 45 years; 85.4% caucasian followed by 4,6% African American.	N=826	ProQOL-V	Being older, woman and African-American were negatively associated with burnout. Years of service showed a positive association with burnout. Marital status, educational level, employment status were not associated with burnout. Perceived organisational and co-worker support was negatively related to burnout. Psychological resilience revealed a negative relationship with burnout. The absence of formal debriefing was associated with increased burnout.
Mostert & Rothmann (2006)	South Africa	Cross-sectional	Age ranged between 19 to 66 with an average of 34.53 years old (SD=6.23); Mean job tenure was of 12.98 years old; 81.90% male and 18.10% female; 40% caucasian and 3.9% Indian.	N=1794	MBI-GS	Age and sex were not associated with burnout. Being Caucasian showed a positive association with increased burnout when compared to indian police officers. Job Stress (because of job demands and lack of resources) was positively associated with exhaustion and cynicism. Only emotional stability and conscientiousness were associated with burnout (low levels of both tend to increase exhaustion and cynicism).
Nascimento et al. (2020)	Brazil	Cross-sectional	Military police officers; 83.5% males and 16.5% females; Age between 21-55; 72.4% had ≤ 20 years of service time; 27.6% had > 21 years of service time;	N = 254	MBI-GS	The higher the service time (professional experience) the lower was the risk for developing burnout. Low levels of physical activity increased the risk for developing burnout.

Note – MBI-HSS (Maslach Burnout Inventory – Human Service Survey); MBI-GS (Maslach Burnout Inventory – General Survey); OLBI (Oldenburg Burnout Inventory); CBI (Copenhagen Burnout Inventory); ProQOL-V (Professional Quality of Life Questionnaire – version V); SBI (Spanish Burnout Inventory).

Author, year	Country	Design	Sample characteristics	Sample size	Burnout scale	Findings
Padyab et al (2016)	Sweden	Cross-sectional	Patrolling Police officers; 419 male and 437 female; Mean age of 34 (SD=7.0) years for women and 40 (SD=11) years for men.	N=856	MBI swedish version by Hallsten (1985)	Stress of conscience, demands, low decision and low social support were positively correlated with EE and DP for both women and men Psychological distancing revealed to be significantly related to EE and DP for both women and men. Wishful thinking was significant only for EE. Planful problem solving, confrontative coping, self-control and positive reappraisal had very weak correlations or were not significant.
Ricca (2004)	USA	Cross-sectional	Municipal police officers; 98% male (n = 49) and 2% female (n = 1); Job tenure ranged from 3 months to 32.5 years.	N = 50	MBI-HSS	Negative correlations were found between EE and DP and emotional intelligence components (EQIT). PA showed a positive correlation. The relationship between negative mood regulation expectancies (NMRT), and burnout, displayed a negative relationship with EE and positive with PA.
Richardson et al. (2006)	Norway	Cross-sectional	119 were men and 30 were women; The mean age for women was 33.9 years (SD=7.2) and for men was 37.2 years (SD=8.0); Average years of experience was 13.4 years.	N=150	MBI-GS	Being female, work conflict, work-family pressure and supervisor support were positively correlated with cynicism whilst leadership, autonomy and co-worker support were negatively correlated. Overtime work and age were not associated with cynicism. Individual characteristics (Type A Behaviour) like achievement striving was negatively associated and irritability was positively associated with burnout. Leadership and supervisor social support were negatively related to cynicism. Work-family pressure was positively associated. Work conflict, autonomy, coworker social support were not associated.
Santa Maria et al. (2019)	Germany	Cross-sectional	72% (n=587) were male and 28% (n=224) female; Mean age of 44.9 years (SD=9.0); Average of service of 24 years.	N=811	German version of the Copenhagen Burnout Inventory by Hanebuth (2012)	The three components of health-oriented leadership were negatively associated with burnout. Follower self-care behaviour was also negatively associated with burnout. Health-oriented Leadership showed to be negatively related with Health problems (operationalised by burnout, depression and physical complaints). Followers Health-behaviours were not associated with health outcomes (thus, burnout).

Note – MBI-HSS (Maslach Burnout Inventory – Human Service Survey); MBI-GS (Maslach Burnout Inventory – General Survey); OLBI (Oldenburg Burnout Inventory); CBI (Copenhagen Burnout Inventory); ProQOL-V (Professional Quality of Life Questionnaire – version V); SBI (Spanish Burnout Inventory).

Author, year	Country	Design	Sample characteristics	Sample size	Burnout scale	Findings
Smoktunowicz et al. (2015)	Poland	Cross-sectional	124 (20%) women and 483 (80%) men; Mean age 36.64 years (SD=7.81); Tenure average was 12.83 years.	N = 625	OLBI	Job demands (positive direction), job control and social support (negative direction) were significantly correlated with exhaustion and disengagement.
Tang & Lau (1996)	China	Cross-sectional	101 male and 16 female; The mean age is of 29.39 years (SD=4.52); Tenure average is 10.93 years.	N = 117	Chinese version of the MBI	For Men, both masculine and feminine gender role stress were positively correlated with EE and DP. For Women, masculine and feminine gender role stress was negatively correlated with personal accomplishment.
Valieiev et al. (2019)	Ukraine	Cross-sectional	129 men (70.1%) and 55 women (29.9%); Age ranged from 20 to 45 with average 30.45 (SD=6.56); Tenure ranged from 1 to 25 (mean 8.75 years); 126 were on field work while 58 were on office service.	N = 184	MBI-HSS adapted version by Vodopyanova and Starchenkova (2009).	Tenure and sex were not associated with burnout. Primary workplace (field of work) revealed to be positively associated with EE and DP, but not with PA.
Violanti et al. (2018)	USA	Cross-sectional	Mean age of 46 years (SD=7.0); 57 women (29%), 143 men (72%); 55% rank of patrol officer.	N = 200	MBI-GS	Age was significant only with professional efficacy. Sex was not associated with burnout. Effort-reward imbalance was positively associated with cynicism and exhaustion but not with professional efficacy. Overcommitment was associated with all three dimensions of burnout, increased cynicism and exhaustion and a decrease in professional efficacy.
Yang et al. (2019)	Taiwan	Cross-sectional	Immigration Officers (ports and airports); 179 males and 52 females; Tenure was 8.24 years in immigration service and 6.47 years in the respective unit.	N = 231	MBI-GS (adapted to immigration jobs)	A positive correlation was found between role conflict and burnout. A correlation was found between work stress and burnout in a positive direction. Social support was negatively correlated with burnout. Age, educational level, tenure were not associated with burnout.

Note – MBI-HSS (Maslach Burnout Inventory – Human Service Survey); MBI-GS (Maslach Burnout Inventory – General Survey); OLBI (Oldenburg Burnout Inventory); CBI (Copenhagen Burnout Inventory); ProQOL-V (Professional Quality of Life Questionnaire – version V); SBI (Spanish Burnout Inventory).

Socio-demographic factors

A total of fifteen studies examined age association with burnout.^{22,23,39-52} Mixed results were described, with four studies^{22,40,45,52} reporting that being younger contributed to increased burnout levels, four other studies^{23,41,50,51} reporting that being older was exacerbating burnout, and seven studies showing age as not being associated with burnout.^{42-44,46-49} Conflicting results were also found between biological sex and burnout. One study⁵² reported men having higher overall burnout compared to women, whereas another study⁴³ reported lower burnout for men. Exhaustion^{41,53} and depersonalisation²² were higher in men whereas cynicism was higher in women.⁴⁸ One study reported higher levels of professional efficacy in men compared to women.⁵⁴ Ten studies reported no differences.^{23,40,45-47,50,51,55-57} With relation to ethnicity, one study stated that being African-American was negatively associated with burnout as compared to being Caucasian.⁵² One other study described that Caucasians suffered from higher depersonalisation compared to Hispanic individuals⁵¹ and in another study, Caucasians reported higher exhaustion levels when compared to Indians.⁴⁷ Officers' marital status was investigated in eight studies and parental status in three studies. With respect to marital status, two studies reported that having a partner was a risk factor.^{22,46} However, six studies found no significant association with burnout.^{42,51-53,56,58} Having children was experienced by police officers as associated with lower personal accomplishment,²³ however, it was also reported as a protective factor against depersonalisation.⁵⁸ In another study, the total number of children contributed to a decrease in burnout, indicating that the higher the number of children the lower the level of burnout.⁴³ Concerning the relationship between educational level and burnout, no significant relationships were found in any of the studies.^{23,44,49,51,52,58}

Individual work-related characteristics

A total of six studies examined work schedules' relation with burnout. Rotating work shifts were found to increase exhaustion and depersonalisation.²³ In one study working continuous shifts was associated with lower professional efficacy, although, no distinction was made as to which type of work shift is more prejudicial to professional efficacy.⁵⁴ An inflexible work schedule was also found to be a risk factor for burnout.⁵⁹ However, in four studies, work shifts, and overtime work were not significantly associated with burnout.^{23,48,50,51} Rank and leadership were investigated in a total of five studies,^{23,44,48,50,58} two showed that leadership or supervisor responsibility diminished cynicism,^{48,50} and one study that higher ranks were associated with lower exhaustion.⁵⁸ On the other hand, having responsibility was described as a risk factor for overall burnout and exhaustion in one

study.⁴⁴ Only one study found no significant relationship.²³ Concerning job length, mixed results were found. In six studies years of service contributed to increased burnout.^{23,51,52,54,58,60} One study revealed a U-shape distribution where burnout increased until 6-15 years of service for all three components, and after 16 years would start decreasing gradually, predicting lesser exhaustion and depersonalisation.⁵⁶ However, two studies reported job tenure to be associated with decreased burnout levels.^{22,61} Three studies found that job length had no association with burnout.^{46,49,57} Police officers' work-post was investigated in two studies. In one study, a variable called primary workplace which encompassed field and office service work contributed to increased exhaustion and depersonalisation.⁵⁷ The second study, found no associations with burnout.²³

Organisational factors

Overall job-related stress characterised by an array of hassles, pressures and organisational constraints was consistently related to higher burnout in six studies.^{44,47,51,62-64} Heavy workload was a risk factor for burnout in nine studies.^{22,41,44,54,58,59,64-66} Physical, mental and emotional demands also increased burnout, whereas cognitive demands seemed to help mitigate burnout.^{54,66,67} Acute fatigue and feeling overwhelmed from performing excessive demands were associated with higher burnout levels^{43,68}. Similar findings relative to a lack of recognition or effort-reward imbalance were reported across four studies. Increased efforts were associated with higher burnout whilst increased rewards resulted in lower burnout.⁵⁸ Imbalance between effort-reward was also consistently reported as a risk factor for burnout.^{40,49,69} Overcommitment,^{40,58} a component of the *Effort-Reward Imbalance Model*, and Perceived unfairness⁵⁹ in the workplace were also reported as burnout risk factors. With respect to police officers' control over their work, low decision latitude, inability to participate in the decision-making process and its communication was associated with higher levels of burnout.^{22,44,65} On the other hand, having control and autonomy in the management of tasks was found to contribute to a decrease in burnout.^{41,48,50,58,66} The sense of personal control at the workplace was also associated with a decrease in burnout.⁷⁰ Two studies reported role conflicts as a risk factor for burnout.^{44,49} Two other studies examined role ambiguity (lack or ambiguous information about assignments); one found that role ambiguity was associated with higher burnout levels,⁵⁹ whilst in the second one role ambiguity showed no significance.⁴⁴ Gender role stress (characterized by a gender-based cognitive appraisal of specific situations) was associated with increased exhaustion and depersonalisation in men and decreased personal accomplishment in women.⁷¹ Organisational culture and climate increased burnout.²² Officers who worked in an urban environment were more prone to higher levels of

exhaustion compared to officers who did not, and officers working in larger departments reported less cynicism.⁵⁴ Political interference in the organization was investigated in two studies and whilst one study reported a positive association with overall burnout, in the other study, this relationship was not significant.^{44,59} Concerning leadership style, one study found that health-oriented leadership significantly contributed to decreasing the levels of burnout among police officers through the creation of favourable healthy work conditions⁷². The absence of leadership at work was significantly related to exhaustion's increment, representing a risk factor.²² The only longitudinal study⁷³ included in this review assessed 12 hypotheses examining the dynamic of job demands and job resources with burnout across a year. It was found that having constantly high job resources, even in an environment where the demands are high, did not help mitigate burnout levels, however, an inverse association was found indicating that when the job resources were constantly low burnout increased. In addition, experiencing an increase or decrease in job resources, in a high-demand environment, contributed to a decrease or increase in burnout, respectively. Moreover, having chronic high or low job demands was not associated with burnout but, on the contrary, experiencing an increase or decrease in job demands exacerbates or mitigates the levels of burnout, respectively.

Operational factors

Eight studies reported on officers' exposure to operational stress and critical situations.^{22,43,51,53,59,62,63,65} In four studies it was found that overall operational stress had a direct relationship with burnout, with one study showing that police officers with daily operational stressors had higher burnout levels compared to officers with occasional stressors.^{51,53,62,63} In one study on internet child exploitation the researchers reported that frequent indirect exposure to crimes against children and the weekly hours working in such cases were associated with an increase in burnout.⁴³ Two studies found that stress of conscience from being exposed to morally ambiguous situations represented a risk factor for burnout.^{22,65} Interactions with the public were not significantly associated with burnout.⁵⁹

Social interactions-related factors

Factors related with social interactions were the most studied burnout factors in police officers.^{22,41,43-46,48-50,58,59,63-66,74,75} In eight studies social support was reported as a protective factor against burnout.^{22,41,46,49,50,58,65,75} Similarly, high levels of work-related support diminish burnout and vice-versa.^{43,59} However, one study found that the higher the

exposure and the satisfaction gathered from work-related support the higher the risk of burnout for police officers.⁷⁴ Regarding supervisors' social support, divergent results were reported in five studies. One study found that supervisor support was associated with more exhaustion.⁶⁶ Three other studies reported protective effects of supervisors' social support on burnout.^{45,48,52} One study found no relationship.⁶³ Co-worker support was found to be associated with lower levels of burnout in two studies,^{48,52} whilst one study reported an increase of burnout,⁶⁶ and two others found no association.^{44,45} It was also described that conflicts in the workplace and unreasonable work group were related to higher burnout levels.^{44,48,50,64} Pressures on work-family relations were examined in two studies and in both, a conflict in the work-family dynamic contributed to an increment of burnout.^{48,50} Outside of the work sphere, two studies showed associations between family-related support and burnout, in opposite directions. High exposure and satisfaction related to family support were associated with increased burnout in one study whilst in another, it mitigated burnout levels.^{45,74}

Individual factors

Six studies examined the relationships between the *Big Five personality traits* and burnout.^{23,47,51,58,75,76} Neuroticism was found to be a consistent risk factor for burnout.^{23,47,51,58,75,76} Whereas four studies reported negative associations between the remaining *Big Five personality traits* (i.e., agreeableness, extraversion, conscientiousness and openness) and burnout.^{23,47,51,58} Personality traits assessed using the *16 Personality Factor Questionnaire* (16PF) were also reported to be associated with burnout.⁵¹ Warmth, emotional stability, social boldness, openness and liveliness were associated with decreased burnout. On the other hand, officers that displayed high levels of traits such as vigilance, self-reliance, tension, apprehension and privateness were found to report higher burnout levels.⁵¹ Concerning dispositional personality traits, psychological hardiness and dispositional mindfulness protected against burnout.^{46,62,76} Trait anger increased burnout levels.⁴⁵ Traits associated with type A personality, such as achievement striving and irritability were found to mitigate and exacerbate cynicism, respectively.⁴⁸ With relation to psychological abilities and emotional states, two studies concluded that higher scores in emotional intelligence was protecting against burnout.^{77,78} Similar relationships were found between burnout, psychological resilience⁵² and police officers' belief in the capacity to self-regulating negative mood states.⁷⁷ In another study, low and high-arousal negative emotions were associated with increased burnout while high-arousal positive emotions helped to mitigate it.⁶⁸ In addition, police officers with a higher trait of meaningfulness and a higher sense of community were less prone to burnout.^{46,54}

Coping strategies

Coping strategies used by police officers to protect themselves from adverse situations were examined in six studies. In five studies, maladaptive coping styles such as avoidance and distancing, manipulative actions, mental disconnection, accepting a lot of responsibility, aggressive and confrontative actions, focusing on emotions and wishful thinking were associated with increased burnout.^{42,51,56,60,65} On the other hand, six studies reported the protective role of healthy coping styles. Positive coping strategies in general, like getting sufficient sleep and taking sufficient breaks from work, positive reappraisal, active coping, seeking social support, being assertive, having self-control, and planning how to solve problems were found to mitigate burnout levels.^{42,43,51,56,60,65} A study explored the associations between burnout and the defence mechanisms from *The Lifestyle Index questionnaire*.⁷⁹ Objection (characterized by a denial of reality), projection (characterized by passing negative feelings and thoughts onto another person) and substitution (characterized by channelizing unacceptable behaviours into acceptable ones) were all associated with a decrease in burnout in police officers with short service time (3 months). On the contrary, in the group of police officers with larger police tenure (5-15 years), objection was found to increase burnout, and rationalization (characterized by cognitive distortions) was found to decrease it.⁶⁰ The practice of physical exercise or sports activities was a protective factor against burnout,^{53,61} whereas engaging in recreational and leisure activities revealed no significance in the alleviation of burnout.⁵³

Discussion

Key findings

Our findings show a wide range of relationships between burnout and socio-demographic factors, work-related characteristics, social factors, individual traits and coping strategies. Overall, half of the studies included in this review addressed socio-demographic variables within their research. However, the findings were not conclusive. For age, sex, marital and parental status, education and ethnicity, inconsistencies and in-existent associations with burnout were found. Occupational factors and social interactions, on the other hand, were found to be the most investigated variables and were also the most consistent in terms of relationship directions with burnout. Social interactions, consisting mostly of social support proved to be a contributing protective factor against burnout, whereas work-related factors were all risk factors for burnout. Operational factors, however,

were the least examined and the least specified. The studies were not detailed in stating what type of operational situations could be associated to burnout. With relation to individual traits and coping strategies, these were examined in 19 studies and showed consistency within the results.

Comparison with the literature

The wider literature seems to support that younger individuals are associated with a higher prevalence of burnout.⁸⁰⁻⁸² A review¹⁹ conducted with police officers had previously reported that stress increased with age, although, a meta-analytical study revealed that age does not appear to have a significant relationship with burnout.⁸³ This should be interpreted with caution as age can be confounded with work experience, resulting in a *survival bias* whereby early career workers reporting higher burnout levels are more inclined to leave their job, leaving a cohort of older workers that, by staying in their job, have likely shown a greater ability to adapt to burnout and are therefore more likely to report lower burnout levels.⁸⁴ Concerning biological sex, there were incongruences found in this review. Two meta-analyses, one on police officers, reported women as having slightly higher emotional exhaustion than men, however, the effect sizes were small, and sex was almost not a noteworthy factor for burnout,^{83,85} thus, caution in interpreting this factor is required. Being single or having no children tends to be associated with a higher burnout⁸⁴ and studies have reported similar patterns in other populations such as physicians.^{80,82} However, other authors report evidence, similar to what was found in our review, challenging the belief that marital status is a relevant factor in relation to burnout.^{82,83} Educational level was also found to not be relevant in any of the included studies. Similar results were reported in a meta-analytical study on correctional officers in which the level of education was not associated with work-related stress.⁸⁶ Studies report that caucasians suffer more burnout than other ethnicities, however, the studies' populations were composed mainly of caucasian police officers with a small presence of other ethnicities. This issue was also reported by a systematic review conducted with underrepresented minorities in medicine,⁸⁷ therefore caution with the interpretation of this findings is required. According to Maslach and Leiter,⁸⁸ demographic characteristics do not have much predictive power on burnout compared with situational and work-related factors, which may be a reflection of the occupational nature of the burnout syndrome.

In this review, high job demands, effort-reward imbalance, low decision latitude, perceived injustice, low social support, lack of leadership, organisational culture, and working in urban environments were found to be associated with burnout, in line with the wide literature.^{18,19,89-91} Holding higher ranks and having responsibilities over people showed

inconsistent associations with burnout, similar to the findings of a review on stress risk factors in police officers.¹⁹ Concerning work schedules, a systematic review on police officers¹⁸ described long working hours and inadequate shifts as risk factors for burnout and overall mental well-being, which is consistent with some of our findings. One of the studies held in China included in the review reported that work-related support increased burnout in police officers. This finding should be interpreted in the light of a Chinese cultural concept called *guanxi*, which is based on moral obligations and favours exchange that, according to the authors, may require higher effort and investment in social relationships that are not always corresponded in the same way.⁶⁶

Few of the included studies approached operational factors, and they were not specific in the type of stressors experienced by the police officers. The different impact that organisational and operational factors may have on police officers' mental health,⁹² especially burnout, may be explained by the fact that the individuals entering the police force are aware of the operational risks but are not ready for the administrative and bureaucratic aspects of the job.⁸⁹ It could also be that operational stressors such as emotional trauma due to the exposure to violent situations show stronger associations with post-traumatic stress disorder (PTSD)⁹³ or other adverse psychological outcomes, compared to burnout. Nevertheless, all the included studies related to operational stressors showed significant relationships between those and burnout, in line with similar findings on the role of daily hassles in first responders.⁹²

High levels in personality traits such as neuroticism, vigilance, tension, apprehension and privateness and other dispositional traits, namely irritability (Type A personality), and negative emotional states were consistently associated with increased levels of burnout. On the contrary, high levels in traits such as agreeableness, extraversion, conscientiousness, openness, hardiness, mindfulness, achievement striving (Type A personality), emotional intelligence, mood regulation and positive emotional states seemed to protect against burnout. These associations are in line with the Maslach and Leiter research⁸⁸ that burnout is usually higher in individuals with high neuroticism, low hardiness, and who exhibit type-A behaviour. Therefore, police officers who are more suspicious, impatient, worried and introverted are likely to experience higher levels of burnout compared to those who show higher emotional stability, are more open to new experiences and to others, experience more positive emotional states and are psychologically more robust^{19,89,94}.

Unsurprisingly, maladaptive coping and positive coping strategies were associated with an increase and decrease in burnout in police officers, respectively. A systematic review on risk factors of police officer's stress¹⁹ reported similar findings, in which police officers that used negative coping such as denial, avoidance, self-blame and distraction,

lack of planning, control and humour experienced higher levels of stress, whereas planning, immediate response to the problem and seeking help from others were good strategies against stressful situations. Beyond that, another systematic review of police officers⁸⁹ found that negative coping strategies such as passive or avoidance coping were also associated with adverse psychological outcomes. The practice of sports activities and physical exercise were protective factors against burnout, consistent with the findings related to the police officers' stress¹⁹. However, physical activity seems to protect against emotional exhaustion, but there is limited evidence concerning cynicism and personal accomplishment⁹⁵. Still, it is well documented that physical activity has considerable beneficial effects on overall health, protecting against cardiovascular disease, diabetes, cancer, obesity, and other individual physical morbidities, and improves psychological well-being by reducing stress, anxiety and depression.^{96,97} Therefore, it was also expected that physical activities would also have a protective effect on burnout levels among the police.

Strengths and limitations

To the best of our knowledge, this is the first systematic review examining the risk and protective factors of burnout in police officers. All the studies included were considered strong or moderate in their quality. The samples included in this review covered a wide range of police officers, from specific police branches to general police forces, excluding those who were considered recruits or in training. No language restrictions were made, increasing the width and sensitivity of the review's search. Importantly, the included studies were conducted in different countries across the world, in different police institutions and under different socio-cultural and crime contexts which makes this review representative. However, most of the studies are from high-income countries (70.7%) which can compromise the applicability of these findings to lower-income countries. Not all studies used the same burnout measurement tool, and in some cases, burnout was measured through isolated subscales. Such discrepancies reflect the need for a concise burnout definition and its assessment through standardised instruments with well-defined psychometric properties.⁹⁸ Additionally, all included studies relied on self-reported data, which can be subjected to social desirability, dishonesty, interpretation and self-evaluation capacity of the individual being surveyed, introducing self-reported bias. Lastly, since 98% of the included studies had a cross-sectional design causal inferences could not be made.

Implications of the findings for future practice and research

This systematic review focused on the identification of psychosocial factors that may be used to raise awareness among policymakers and police departments, and to provide information for creating pathways for future research, prevention strategies and interventions for police officers that can increase their workplace well-being.

Despite this review not being able to confirm causal effects, it seems evident that factors like heavy workload, lack of recognition, lack of control, lack of fairness, low social support, role conflicts, role ambiguity, lack of leadership, operational stress, neuroticism, negative emotions and maladaptive coping strategies such as avoidance are significant risk factors for burnout in police officers, whereas social support, health-oriented leadership, psychological hardiness, agreeableness, extroversion and openness to new experiences, active and problem-focused coping strategies, and physical exercise are protective factors.

Workers with good mental health are likely to have a higher job performance which consequently will improve the job environment, increase employee retention at the job and improve the organisation's profitability by not increasing expenses with turnover.⁹⁹ Hence, the development of interventions that can mitigate the adverse factors and maximise the effects of the protective factors is of great importance.

According to a study developed with police officers in South Korea, organisational stressors do play a significant role in police officers' mental and physical health such as fatigue, indigestion, irritability and anxiety.¹⁰⁰ Importantly, suicide among police officers is another serious problem. In 11 years (1999, 2003, 2004, 2007-2014) a total of 1,241 suicide deaths of police officers occurred in the USA, making police officers 54% more likely to die from suicide compared to all other worker decedents in the study.¹⁰¹ A review on suicide risk factors in police officers, reported that burnout contributes as a risk factor to suicidal behaviours mediated by depression and anxiety²⁵ which is a more pressing reason to work on police officers' mental well-being. However, it seems that there is still not sufficient research to establish well-grounded guidelines concerning the development of standard interventions for burnout.¹⁰² According to Maslach, several potential interventions have been proposed for tackling burnout, however, it is not clear how many of these have actually been put into practice, possibly because of the required rigorous criteria for developing and testing them.¹⁰³ Still, changes and interventions in the police structure must be considered, taking into account the police culture and the stigma associated with mental health, as it represents a barrier that keeps police officers from seeking the help they need due to self-stigma, fear of punitive implications on their careers and reputation among the general public.¹⁰⁴⁻¹⁰⁶

It is also important to have in mind that police officers, in many cases, are the first entity to come in contact with people suffering from mental illness,¹⁰⁷ leaving police officers with the discretionary task of doing arrests or escorting these people for a mental health assessment or treatment.¹⁰⁸ The literature is wide in specialised training programmes to enable police officers to recognise such situations.¹⁰⁹ Thus, investment should be made in training police officers to also be able to identify symptoms associated with their own mental health in order to avoid more severe outcomes.

The number of articles examining associations in relation to burnout in police officers reflects the interest in the topic. However, there are certain aspects that need to be further explored in the future. Almost all of the studies included were cross-sectional which does not allow for confirmation of causal relationships, therefore studies with a more robust design are recommended. In addition, despite the fairly good number of studies included in this review some of the factors were examined in a limited number of studies, not allowing comparison within the findings. Moreover, it was noticed that research on police officers' burnout is focusing more on the organisational aspects of the job leaving aside other factors. It is known that the aetiology of burnout as an occupational phenomenon is not restricted to occupational factors¹¹, so further research on relevant personal and social factors is recommended. Future research should also take into account the differences across police units, as police officers may perform different roles based on their expertise. Furthermore, it was also noticed that research on burnout in police officers is focusing more on factors that may potentially cause burnout instead of those that may protect against it. Bi-directional relationships reported in this review with factors that can be modified such as coping strategies also call for cautious interpretation of the results, as burnout can have a potentially causal contribution towards them. More longitudinal studies are needed addressing these aspects to enable a better understanding of the interactions between these factors and the impact on burnout within populations of police officers. Finally, a meta-analysis to define the exact strength of the reported associations between protective and risk factors and burnout seems a reasonable step forward, though to date there are not sufficient studies focusing on each of the explored factors.

Conclusions

This systematic review points out the most prominent risk and protective factors associated with burnout in police officers. It seems that burnout, despite being strictly defined as a phenomenon of the occupational context, is also influenced by factors outside of this domain. Police officers are known to suffer high levels of exposure to stressful and

critical situations, which requires a constant need to monitor their well-being. Police organisations and their leaders should pay more attention to their people's health, especially at a psychological level which is more concealed, and lead by example encouraging a job culture that values people's well-being above all. Creating changes and implementing interventions in police organisations with this purpose may be a complex task. Still, working in the direction of prevention and raising awareness seems to be the needed path.

References

- 1 Górný M. The importance of work in human life and development. The consequences of unemployment. 2018;51-64. Doi:10.14746/r.2018.2.4
- 2 Blustein DL. The role of work in psychological health and well-being: a conceptual, historical, and public policy perspective. *Am Psychol.* 2008;63(4):228-40. Doi:10.1037/0003-066x.63.4.228
- 3 Schabracq M, Cooper C. The changing nature of work and stress. *Journal of Managerial Psychology.* 2000;15:227-41. Doi:10.1108/02683940010320589
- 4 Quick JC, Henderson DF. Occupational Stress: Preventing Suffering, Enhancing Wellbeing. *Int J Environ Res Public Health.* 2016;13(5). Doi:10.3390/ijerph13050459
- 5 Maslach C, Leiter MP. The truth about burnout: How organizations cause personal stress and what to do about it. San Francisco, CA, US: Jossey-Bass; 1997. xi, 186-xi, p.
- 6 Freudenberger HJ. Staff Burn-Out. *Journal of Social Issues.* 1974;30(1):159-65. Doi:<https://doi.org/10.1111/j.1540-4560.1974.tb00706.x>
- 7 Maslach C. Burned-Out. *Human Behavior.* 1976;9:16-22.
- 8 World Health Organization (WHO). International Classification of Diseases and Related Health Problems, Eleventh Revision (11th) 2019. Available from: <https://icd.who.int/en>.
- 9 Maslach C, Jackson SE. The measurement of experienced burnout. *Journal of organizational behavior.* 1981;2(2):99-113.
- 10 WHO.int [Internet]. Burn-out an “occupational phenomenon”: International Classification of Diseases. World Health Organization - Newsletter; 2019 [updated 2019 May 28; cited 2022 August 26]. Available from: <https://www.who.int/news/item/28-05-2019-burn-out-an-occupational-phenomenon-international-classification-of-diseases>.
- 11 Schaufeli W, Enzmann D. The Burnout Companion to Study and Practice: A Critical Analysis. 1st Edition ed. London: CRC Press; 1998. 232 p.
- 12 Marques-Pinto A, Chambel MJ. Burnout e engagement em contexto organizacional: estudos com amostras portuguesas: Lisboa: Livros Horizonte; 2008. 246 p.
- 13 Gomes GP, Ribeiro N, Gomes DR. The Impact of Burnout on Police Officers' Performance and Turnover Intention: The Moderating Role of Compassion Satisfaction. *Administrative Sciences.* 2022;12(3):92. Doi:10.3390/admsci12030092
- 14 Hess KM. Introduction to Law Enforcement and Criminal Justice. 9th ed: Cengage Learning 2008.
- 15 Waters JA, Ussery W. Police stress: history, contributing factors, symptoms, and interventions. *Policing: An International Journal of Police Strategies & Management.* 2007;30(2):169-88. Doi:10.1108/13639510710753199

- 16 Richardson NJ, Barrick K, Strom KJ. Is policing safer today? *Criminology & Public Policy*. 2019;18(1):37-45. Doi:<https://doi.org/10.1111/1745-9133.12418>
- 17 Shane JM. Organizational stressors and police performance. *Journal of Criminal Justice*. 2010;38(4):807-18. Doi:<https://doi.org/10.1016/j.jcrimjus.2010.05.008>
- 18 Purba A, Demou E. The relationship between organisational stressors and mental wellbeing within police officers: a systematic review. *BMC Public Health*. 2019;19(1):1286. Doi:10.1186/s12889-019-7609-0
- 19 Galanis P, Fragkou D, Katsoulas TA. Risk factors for stress among police officers: A systematic literature review. *Work*. 2021;68(4):1255-72. Doi:10.3233/wor-213455
- 20 Magnavita N, Capitanelli I, Garbarino S, Pira E. Work-related stress as a cardiovascular risk factor in police officers: a systematic review of evidence. *Int Arch Occup Environ Health*. 2018;91(4):377-89. Doi:10.1007/s00420-018-1290-y
- 21 McCarty WP, Aldirawi H, Dewald S, Palacios M. Burnout in Blue: An Analysis of the Extent and Primary Predictors of Burnout Among Law Enforcement Officers in the United States. *Police Quarterly*. 2019;22(3):278-304. Doi:10.1177/1098611119828038
- 22 Backteman-Erlanson S, Padyab M, Brulin C. Prevalence of burnout and associations with psychosocial work environment, physical strain, and stress of conscience among Swedish female and male police personnel. *Police Practice & Research: An International Journal*. 2013;14(6):491-505. Doi:10.1080/15614263.2012.736719
- 23 De la Fuente Solana EI, Aguayo Extremera R, Vargas Pecino C, Cañadas de la Fuente GR. Prevalence and risk factors of burnout syndrome among Spanish police officers. *Psicothema*. 2013;25(4):488-93. Doi:10.7334/psicothema2013.81
- 24 Violanti JM, Charles LE, McCanlies E, Hartley TA, Baughman P, Andrew ME, et al. Police stressors and health: a state-of-the-art review. *Policing*. 2017;40(4):642-56. Doi:10.1108/pijpsm-06-2016-0097
- 25 Krishnan N, Steene L, Lewis M, Marshall D, Ireland JL. A Systematic Review of Risk Factors Implicated in the Suicide of Police Officers. *Journal of Police and Criminal Psychology*. 2022:1-13. Doi:10.1007/s11896-022-09539-1
- 26 Queirós C, Kaiseler M, Da Silva AL. Burnout as a predictor of aggressivity among police officers. 2013. Doi:10.5553/EJPS/2034760X2013001002003
- 27 Rahim A, Cosby DM. A model of workplace incivility, job burnout, turnover intentions, and job performance. *Journal of Management Development*. 2016.
- 28 Salvagioni DAJ, Melanda FN, Mesas AE, González AD, Gabani FL, Andrade SM. Physical, psychological and occupational consequences of job burnout: A systematic review of prospective studies. *PLoS One*. 2017;12(10):e0185781. Doi:10.1371/journal.pone.0185781
- 29 Page MJ, Moher D, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. PRISMA 2020 explanation and elaboration: updated guidance and exemplars for reporting systematic reviews. *BMJ*. 2021;372:n160. Doi:10.1136/bmj.n160

- 30 Eriksen MB, Frandsen TF. The impact of patient, intervention, comparison, outcome (PICO) as a search strategy tool on literature search quality: a systematic review. *J Med Libr Assoc.* 2018;106(4):420-31. Doi:10.5195/jmla.2018.345
- 31 Lucas Alves, Lee Abreo, Eleni Petkari, Mariana Pinto da Costa. Psychosocial risk and protective factors associated with burnout in the police: a systematic review. PROSPERO 2022 CRD42022290022. Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42022290022.
- 32 CASP. Critical Appraisal Skills Programme - Cohort Study Checklist. 2018 [Accessed 2022 August 10; cited 2022 August 27]. Available from: https://casp-uk.b-cdn.net/wp-content/uploads/2018/03/CASP-Cohort-Study-Checklist-2018_fillable_form.pdf.
- 33 Popay J, Roberts H, Sowden A, Petticrew M, Arai L, Rodgers M, et al. Guidance on the conduct of narrative synthesis in systematic reviews. A product from the ESRC methods programme Version. 2006;1(1):b92. Doi:10.13140/2.1.1018.4643
- 34 Maslach C, Jackson SE, Leiter MP. Maslach Burnout Inventory (3rd ed.). 1996.
- 35 Halbesleben JRB, Demerouti E. The construct validity of an alternative measure of burnout: Investigating the English translation of the Oldenburg Burnout Inventory. *Work & Stress.* 2005;19(3):208-20. Doi:10.1080/02678370500340728
- 36 McClure C. Exploring Reliability and Validity for the Professional Quality of Life Scale. *JOURNAL OF SOCIAL SCIENCE RESEARCH.* 2022;18:45-55. Doi:10.24297/jssr.v18i.9196
- 37 Kristensen TS, Borritz M, Villadsen E, Christensen KB. The Copenhagen Burnout Inventory: A new tool for the assessment of burnout. *Work & Stress.* 2005;19(3):192-207. Doi:10.1080/02678370500297720
- 38 Figueiredo-Ferraz H, Gil-Monte PR, Grau-Alberola E. Psychometric properties of the "Spanish Burnout Inventory" (SBI): Adaptation and validation in a Portuguese-speaking sample. *European Review of Applied Psychology.* 2013;63(1):33-40. Doi:<https://doi.org/10.1016/j.erap.2012.08.003>
- 39 Zhang S-Y, Xu Y, Jiang J. Relationship of Police Officers' Job Burnout with Job Demands, Job Resources, Physical and Mental Health. *Chinese Journal of Clinical Psychology.* 2006;14(4):391-2.
- 40 Violanti JM, Mnatsakanova, Anna, Andrew, Michael E., Allison, Penelope, Gu, Ja Kook, Fekedulegn, Desta. Effort-Reward Imbalance and Overcommitment at Work, Associations With Police Burnout. *Police quarterly.* 2018;21(4):440-60. Doi:10.1177/1098611118774764
- 41 Smoktunowicz E, Baka L, Cieslak R, Nichols CF, Benight CC, Luszczynska A. Explaining Counterproductive Work Behaviors Among Police Officers: The Indirect Effects of Job Demands Are Mediated by Job Burnout and Moderated by Job Control and Social Support. *Human Performance.* 2015;28(4):332-50. Doi:10.1080/08959285.2015.1021045
- 42 Mella DB, Boutin APK. Burnout and Coping Strategies in Male Staff from National Police in Valparaiso, Chile. *IRANIAN JOURNAL OF PUBLIC HEALTH.* 2013;42(9):950-9.

- 43 Brady PQ. Crimes Against Caring: Exploring the Risk of Secondary Traumatic Stress, Burnout, and Compassion Satisfaction Among Child Exploitation Investigators. *JOURNAL OF POLICE AND CRIMINAL PSYCHOLOGY*. 2017;32(4):305-18. Doi:10.1007/s11896-016-9223-8
- 44 Bawa N, Kaur R. Occupational stress and burnout among police officers. *Indian Journal of Community Psychology*. 2011;7(2):362-72.
- 45 Baruch-Feldman C, Brondolo E, Ben-Dayana D, Schwartz J. Sources of social support and burnout, job satisfaction, and productivity. *Journal of Occupational Health Psychology*. 2002;7(1):84-93. Doi:10.1037/1076-8998.7.1.84
- 46 Fyhn T, Fjell KK, Johnsen BH. Resilience Factors Among Police Investigators: Hardiness-commitment a Unique Contributor. *Journal of Police and Criminal Psychology*. 2016;31(4):261-9. Doi:10.1007/s11896-015-9181-6
- 47 Mostert K, Rothmann S. Work-related well-being in the South African Police Service. *Journal of Criminal Justice*. 2006;34(5):479-91. Doi:10.1016/j.jcrimjus.2006.09.003
- 48 Richardsen AM, Burke RJ, Martinussen M. Work and health outcomes among police officers: The mediating role of police cynicism and engagement. *International Journal of Stress Management*. 2006;13(4):555-74. Doi:10.1037/1072-5245.13.4.555
- 49 Yang FC, Kao RH, Cho CC. A multilevel study on the causal relationship in association network of work stress Moderating effects of social support. *POLICING-AN INTERNATIONAL JOURNAL OF POLICE STRATEGIES & MANAGEMENT*. 2019;42(4):624-39. Doi:10.1108/PIJPSM-07-2018-0086
- 50 Martinussen M, Richardsen AM, Burke RJ. Job demands, job resources, and burnout among police officers. *Journal of Criminal Justice*. 2007;35(3):239-49. Doi:10.1016/j.jcrimjus.2007.03.001
- 51 Medina AM. The role of personality and coping in police patrol officer stress and burnout: ProQuest Information & Learning; 2007.
- 52 Miller A, Unruh L, Wharton T, Liu XA, Zhang NJ. The relationship between perceived organizational support, perceived coworker support, debriefing and professional quality of life in Florida law enforcement officers. *International Journal of Police Science and Management*. 2017;19(3):129-39. Doi:10.1177/1461355717717995
- 53 Garcia-Rivera BR, Olguin-Tiznado JE, Aranibar MF, Ramirez-Baron MC, Camargo-Wilson C, Lopez-Barreras JA, et al. Burnout Syndrome in Police Officers and Its Relationship with Physical and Leisure Activities. *INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH*. 2020;17(15). Doi:10.3390/ijerph17155586
- 54 Burke RJ, Mikkelsen A. Burnout among norwegian police officers: Potential antecedents and consequences. *International Journal of Stress Management*. 2006;13(1):64-83. Doi:10.1037/1072-5245.13.1.64
- 55 Burke RJ, Richardsen AM, Martinussen M. Gender differences in policing: Reasons for optimism? *Policing*. 2006;29(3):513-23. Doi:10.1108/13639510610684737

- 56 Durán MA, Montalbán FM, Stangeland P. Burnout in police work: Incidence profile and influence of socio-demographic factors. *Revista de Psicologia Social*. 2006;21(1):95-107. Doi:10.1174/021347406775322205
- 57 Valieiev R, Polyvaniuk V, Antonenko T, Rebkalo M, Sobakar A, Oliinyk V. The Effects of Gender, Tenure and Primary Workplace on Burnout of Ukrainian Police Officers. *POSTMODERN OPENINGS*. 2019;10(4):116-31. Doi:10.18662/po/97
- 58 Garbarino S, Cuomo, Giovanni, Chiorri, Carlo, Magnavita, Nicola. Association of work-related stress with mental health problems in a special police force unit. *BMJ open*. 2013;3(7). Doi:10.1136/bmjopen-2013-002791
- 59 Kumar V, Kamalanabhan TJ. Moderating Role of Work Support in Stressor–Burnout Relationship: An Empirical Investigation Among Police Personnel in India. *Psychological Studies*. 2017;62(1):85-97. Doi:10.1007/s12646-017-0383-0
- 60 Fedorenko O, Dotsenko V, Okhrimenko I, Radchenko K, Gorbenko D. Coping Behavior of Criminal Police Officers at Different Stages of Professional Activity. *BRAIN-BROAD RESEARCH IN ARTIFICIAL INTELLIGENCE AND NEUROSCIENCE*. 2020;11(2):124-46. Doi:10.18662/brain/11.2/78
- 61 Nascimento VMSD, Oliveira LASD, Teles LL, Oliveira DPM, Soares NMM, Silva RJDS. Mental Health and Physical Activity Level in Military Police Officers from Sergipe, Brazil. *Motricidade*. 2020;16(S1):136-43. Doi:10.6063/motricidade.22334
- 62 Kepple JD. Trait mindfulness and effects on stress and burnout in law enforcement officers: ProQuest Information & Learning; 2018.
- 63 Kula S. Occupational stress, supervisor support, job satisfaction, and work-related burnout: perceptions of Turkish National Police (TNP) members. *POLICE PRACTICE AND RESEARCH*. 2017;18(2):146-59. Doi:10.1080/15614263.2016.1250630
- 64 Baka L. The effects of job demands on mental and physical health in the group of police officers Testing the mediating role of job burnout. *Studia Psychologica*. 2015;57(4):285-300. Doi:10.21909/sp.2015.03.700
- 65 Padyab M, Backteman-Erlanson S, Brulin C. Burnout, Coping, Stress of Conscience and Psychosocial Work Environment among Patrolling Police Officers. *Journal of Police and Criminal Psychology*. 2016;31(4):229-37. Doi:10.1007/s11896-015-9189-y
- 66 Hu Q, Schaufeli WB, Taris TW. Extending the job demands-resources model with guanxi exchange. *Journal of Managerial Psychology*. 2016;31(1):127-40. Doi:10.1108/JMP-04-2013-0102
- 67 Bakker AB, Heuven E. Emotional dissonance, burnout, and in-role performance among nurses and police officers. *International Journal of Stress Management*. 2006;13(4):423-40. Doi:10.1037/1072-5245.13.4.423
- 68 Basinska BA, Wiciak I, Dąderman AM. Fatigue and burnout in police officers: The mediating role of emotions. *Policing*. 2014;37(3):665-80. Doi:10.1108/PIJPSM-10-2013-0105

- 69 Euwema MC, Kop N, Bakker AB. The behaviour of police officers in conflict situations: How burnout and reduced dominance contribute to better outcomes. *Work and Stress*. 2004;18(1):23-38. Doi:10.1080/0267837042000209767
- 70 Dudek B, Merecz D, Makowska Z. Sense of personal control and the level of occupational stress and related effects. *Medycyna pracy*. 2001;52(6):451-7.
- 71 Tang CSK, Lau BHB. Gender role stress and burnout in Chinese human service professionals in Hong Kong. *ANXIETY STRESS AND COPING*. 1996;9(3):217-27. Doi:10.1080/10615809608249403
- 72 Santa Maria A, Wolter C, Gusy B, Kleiber D, Renneberg B. The Impact of Health-Oriented Leadership on Police Officers' Physical Health, Burnout, Depression and Well-Being. *POLICING-A JOURNAL OF POLICY AND PRACTICE*. 2019;13(2):186-200. Doi:10.1093/police/pay067
- 73 Hu Q, Schaufeli WB, Taris TW. How are changes in exposure to job demands and job resources related to burnout and engagement? A longitudinal study among Chinese nurses and police officers. *Stress and Health*. 2017;33(5):631-44. Doi:10.1002/smi.2750
- 74 Beltran CA, Moreno MP, Estrada JGS, Lopez TMT, Rodriguez MGA. Social Support, Burnout Syndrome and Occupational Exhaustion among Mexican Traffic Police Agents. *SPANISH JOURNAL OF PSYCHOLOGY*. 2009;12(2):585-92. Doi:10.1017/S1138741600001955
- 75 Farfán J, Peña M, Topa G. Lack of group support and burnout syndrome in workers of the state security forces and corps: Moderating role of neuroticism. *Medicina (Lithuania)*. 2019;55(9). Doi:10.3390/medicina55090536
- 76 Hills H, Norvell, N. An examination of hardiness and neuroticism as potential moderators of stress outcomes. *Behavioral medicine (Washington, DC)*. 1991;17(1):31-8.
- 77 Ricca D. Emotional intelligence, negative mood regulation expectancies, and professional burnout among police officers: ProQuest Information & Learning; 2004.
- 78 Thomas M. Emotional intelligence and its effect on police officer burnout: ProQuest Information & Learning; 2021.
- 79 Davidson K, MacGregor MW. A critical appraisal of self-report defense mechanism measures. *Journal of Personality*. 1998;66:965-92. Doi:10.1111/1467-6494.00039
- 80 Azam K, Khan A, Alam MT. Causes and Adverse Impact of Physician Burnout: A Systematic Review. *J Coll Physicians Surg Pak*. 2017;27(8):495-501.
- 81 Singh P, Aulak DS, Mangat SS, Aulak MS. Systematic review: factors contributing to burnout in dentistry. *Occup Med (Lond)*. 2016;66(1):27-31. Doi:10.1093/occmed/kqv119
- 82 Yates M, Samuel V. Burnout in oncologists and associated factors: A systematic literature review and meta-analysis. *Eur J Cancer Care (Engl)*. 2019;28(3):e13094. Doi:10.1111/ecc.13094

- 83 Aguayo R, Vargas C, Cañadas GR, De la Fuente EI. Are socio-demographic factors associated to burnout syndrome in police officers? A correlational meta-analysis. *Anales de Psicología/Annals of Psychology*. 2017;33(2):383-92. Doi:10.6018/analesps.33.2.260391
- 84 Maslach C, Schaufeli WB, Leiter MP. Job burnout. *Annu Rev Psychol*. 52. 2001/01/10 ed2001. p. 397-422.
- 85 Purvanova RK, Muros JP. Gender differences in burnout: A meta-analysis. *Journal of Vocational Behavior*. 2010;77(2):168-85. Doi:<https://doi.org/10.1016/j.jvb.2010.04.006>
- 86 Dowden C, Tellier C. Predicting work-related stress in correctional officers: A meta-analysis. *Journal of Criminal Justice*. 2004;32(1):31-47. Doi:<https://doi.org/10.1016/j.icrimjus.2003.10.003>
- 87 Lawrence JA, Davis BA, Corbette T, Hill EV, Williams DR, Reede JY. Racial/Ethnic Differences in Burnout: a Systematic Review. *J Racial Ethn Health Disparities*. 2022;9(1):257-69. Doi:10.1007/s40615-020-00950-0
- 88 Maslach C, Leiter MP. Burnout. *Stress: Concepts, Cognition, Emotion, and Behavior*. 2016:351-7. Doi:10.1016/b978-0-12-800951-2.00044-3
- 89 Sherwood L, Hegarty, Siobhan, Vallieres, Frederique, Hyland, Philip, Murphy, Jamie, Fitzgerald, Geraldine, Reid, Tracey. Identifying the Key Risk Factors for Adverse Psychological Outcomes Among Police Officers, A Systematic Literature Review. *Journal of traumatic stress*. 2019;32(5):688-700. Doi:<https://dx.doi.org/10.1002/jts.22431>
- 90 Acquadro Maran D, Magnavita N, Garbarino S. Identifying Organizational Stressors That Could Be a Source of Discomfort in Police Officers: A Thematic Review. *Int J Environ Res Public Health*. 2022;19(6). Doi:10.3390/ijerph19063720
- 91 Nieuwenhuijsen K, Bruinvels D, Frings-Dresen M. Psychosocial work environment and stress-related disorders, a systematic review. *Occup Med (Lond)*. 2010;60(4):277-86. Doi:10.1093/occmed/kqq081
- 92 Larsson G, Berglund AK, Ohlsson A. Daily hassles, their antecedents and outcomes among professional first responders: A systematic literature review. *Scand J Psychol*. 2016;57(4):359-67. Doi:10.1111/sjop.12303
- 93 Mona GG, Chimbari MJ, Hongoro C. A systematic review on occupational hazards, injuries and diseases among police officers worldwide: Policy implications for the South African Police Service. *Journal of Occupational Medicine and Toxicology*. 2019;14(1):2. Doi:10.1186/s12995-018-0221-x
- 94 Alarcon G, Eschleman KJ, Bowling NA. Relationships between personality variables and burnout: A meta-analysis. *Work & Stress*. 2009;23:244-63. Doi:10.1080/02678370903282600
- 95 Naczenski LM, Vries JD, Hooff M, Kompier MAJ. Systematic review of the association between physical activity and burnout. *J Occup Health*. 2017;59(6):477-94. Doi:10.1539/joh.17-0050-RA
- 96 Warburton DE, Nicol CW, Bredin SS. Health benefits of physical activity: the evidence. *Cmaj*. 2006;174(6):801-9. Doi:10.1503/cmaj.051351

- 97 Saxena S, Van Ommeren M, Tang KC, Armstrong TP. Mental health benefits of physical activity. *Journal of Mental Health*. 2005;14:445-51. Doi:10.1080/09638230500270776
- 98 Queirós C, Passos F, Bártolo A, Marques AJ, da Silva CF, Pereira A. Burnout and Stress Measurement in Police Officers: Literature Review and a Study With the Operational Police Stress Questionnaire. *Frontiers in Psychology*. 2020;11. Doi:10.3389/fpsyg.2020.00587
- 99 Wright TA, Huang CC. The many benefits of employee well-being in organizational research. *Journal of Organizational Behavior*. 2012;33(8):1188-92.
- 100 Cho JT, Park J. Exploring the effects of various types of stressors on the physical and mental health symptoms of police officers in South Korea. *International Journal of Law, Crime and Justice*. 2021;67:100494. Doi:10.1016/j.ijlcj.2021.100494
- 101 Violanti JM, Steege A. Law enforcement worker suicide: an updated national assessment. *Policing*. 2021;44(1):18-31. Doi:10.1108/pijpsm-09-2019-0157
- 102 Heinemann LV, Heinemann T. Burnout Research: Emergence and Scientific Investigation of a Contested Diagnosis. *SAGE Open*. 2017;7(1):2158244017697154. Doi:10.1177/2158244017697154
- 103 Maslach C, Leiter M. It's time to take action on burnout. *Burnout Research*. 2015;33. Doi:10.1016/j.burn.2015.05.002
- 104 Demou E, Hale H, Hunt K. Understanding the mental health and wellbeing needs of police officers and staff in Scotland. *POLICE PRACTICE AND RESEARCH*. 2020;21(6):702-16. Doi:10.1080/15614263.2020.1772782
- 105 Karaffa KM, Koch JM. Stigma, Pluralistic Ignorance, and Attitudes Toward Seeking Mental Health Services Among Police Officers. *Criminal Justice and Behavior*. 2015;43(6):759-77. Doi:10.1177/0093854815613103
- 106 Jetelina KK, Molsberry RJ, Gonzalez JR, Beauchamp AM, Hall T. Prevalence of Mental Illness and Mental Health Care Use Among Police Officers. *JAMA Network Open*. 2020;3(10):e2019658-e. Doi:10.1001/jamanetworkopen.2020.19658
- 107 Soares R, Pinto da Costa M. Experiences and Perceptions of Police Officers Concerning Their Interactions With People With Serious Mental Disorders for Compulsory Treatment. *Frontiers in Psychiatry*. 2019;10. Doi:10.3389/fpsyg.2019.00187
- 108 Fiske ZR, Songer DM, Schriver JL. A national survey of police mental health training. *Journal of police and criminal psychology*. 2021;36(2):236-42.
- 109 Booth A, Scantlebury A, Hughes-Morley A, Mitchell N, Wright K, Scott W, et al. Mental health training programmes for non-mental health trained professionals coming into contact with people with mental ill health: a systematic review of effectiveness. *BMC Psychiatry*. 2017;17(1):196. Doi:10.1186/s12888-017-1356-5

APPENDIXES

Appendix I – Quality assessment of the included studies

Author, year	Ratings	SECTION A: Study validity								SECTION B: Results precision			SECTION C: Contribution to local context		
		1. Did the study address a clearly focused issue?	2. Was the cohort (sample) recruited in an acceptable way?	3. Was the exposure accurately measured to minimise bias?	4. Was the outcome accurately measured to minimise bias?	5. (a) Have the authors identified all important confounding factors?	5. (b) Have they taken account of the confounding factors in the design and/or analysis?	6. (a) Was the follow up of subjects complete enough?	6. (b) Was the follow up of subjects long enough?	7. What are the results of this study?	8. How precise are the results?	9. Do you believe the results?	10. Can the results be applied to the local population?	11. Do the results of this study fit with other available evidence?	12. What are the implications of this study for practice?
CROSS-SECTIONAL STUDIES															
Backteman-Erlanson et al. (2013)	YES CAN'T TELL NO	YES	YES	YES	YES	NO	YES	N/A	N/A	extracted data table	Accurate	YES	YES	YES	YES
Baka (2015)	YES CAN'T TELL NO	YES	YES	YES	YES	NO	YES	N/A	N/A	extracted data table	Accurate	YES	YES	YES	YES
Bakker & Heuven (2006)	YES CAN'T TELL NO	YES	YES	YES	YES	NO	CAN'T TELL	N/A	N/A	extracted data table	Accurate	YES	YES	YES	YES
Baruch-Feldman et al. (2002)	YES CAN'T TELL NO	YES	YES	YES	YES	NO	YES	N/A	N/A	extracted data table	Accurate	YES	YES	YES	NO
Basinska et al. (2014)	YES CAN'T TELL NO	YES	CAN'T TELL	YES	YES	NO	NO	N/A	N/A	extracted data table	Accurate	YES	YES	YES	YES
Bawa & Kaur (2011)	YES CAN'T TELL NO	YES	CAN'T TELL	YES	YES	NO	YES	N/A	N/A	extracted data table	Accurate	YES	CAN'T TELL	YES	NO
Beltran et al. (2009)	YES CAN'T TELL NO	YES	CAN'T TELL	YES	YES	NO	NO	N/A	N/A	extracted data table	Accurate	YES	YES	NO	NO
Brady (2017)	YES CAN'T TELL NO	YES	YES	YES	YES	YES	YES	N/A	N/A	extracted data table	Accurate	YES	YES	YES	YES
Burke & Mikkelsen (2006)	YES CAN'T TELL NO	YES	YES	YES	YES	NO	YES	N/A	N/A	extracted data table	Accurate	YES	YES	YES	YES
Burke et al. (2006)	YES CAN'T TELL NO	YES	YES	YES	YES	NO	NO	N/A	N/A	extracted data table	Accurate	YES	YES	YES	NO

Appendix I – Quality assessment of the included studies

Author, year	Ratings	SECTION A: Study validity								SECTION B: Results precision			SECTION C: Contribution to local context		
		1. Did the study address a clearly focused issue?	2. Was the cohort (sample) recruited in an acceptable way?	3. Was the exposure accurately measured to minimise bias?	4. Was the outcome accurately measured to minimise bias?	5. (a) Have the authors identified all important confounding factors?	5. (b) Have they taken account of the confounding factors in the design and/or analysis?	6. (a) Was the follow up of subjects complete enough?	6. (b) Was the follow up of subjects long enough?	7. What are the results of this study?	8. How precise are the results?	9. Do you believe the results?	10. Can the results be applied to the local population?	11. Do the results of this study fit with other available evidence?	12. What are the implications of this study for practice?
CROSS-SECTIONAL STUDIES															
De la Fuente et al. (2013)	YES									extracted data table					
	CAN'T TELL														
	NO	YES	YES	YES	YES	NO	YES	N/A	N/A		Accurate	YES	YES	YES	YES
Dudek et al. (2001)	YES									extracted data table					
	CAN'T TELL														
	NO	YES	CAN'T TELL	YES	YES	NO	NO	N/A	N/A		Accurate	YES	YES	YES	NO
Durán et al. (2006)	YES									extracted data table					
	CAN'T TELL														
	NO	YES	YES	YES	YES	NO	YES	N/A	N/A		Accurate	YES	YES	YES	NO
Euwema et al. (2004)	YES									extracted data table					
	CAN'T TELL														
	NO	YES	CAN'T TELL	YES	YES	NO	CAN'T TELL	N/A	N/A		Accurate	YES	YES	YES	YES
Farfán et al. (2019)	YES									extracted data table					
	CAN'T TELL														
	NO	YES	CAN'T TELL	YES	YES	NO	NO	N/A	N/A		Accurate	YES	YES	YES	YES
Fedorenko et al. (2020)	YES									extracted data table					
	CAN'T TELL														
	NO	YES	CAN'T TELL	YES	YES	NO	NO	N/A	N/A		Accurate	CAN'T TELL	CAN'T TELL	YES	NO
Fyhn et al. (2016)	YES									extracted data table					
	CAN'T TELL														
	NO	YES	YES	YES	YES	YES	YES	N/A	N/A		Accurate	YES	YES	YES	YES
Garbarino et al. (2013)	YES									extracted data table					
	CAN'T TELL														
	NO	YES	YES	YES	YES	YES	YES	N/A	N/A		Accurate	YES	YES	YES	NO
Garcia-Rivera et al. (2020)	YES									extracted data table					
	CAN'T TELL														
	NO	YES	YES	YES	YES	NO	YES	N/A	N/A		Accurate	YES	YES	YES	YES
Hills & Norvell (1991)	YES									extracted data table					
	CAN'T TELL														
	NO	YES	CAN'T TELL	YES	YES	NO	NO	N/A	N/A		Accurate	YES	NO	YES	NO

Appendix I – Quality assessment of the included studies

Author, year	Ratings	SECTION A: Study validity								SECTION B: Results precision			SECTION C: Contribution to local context		
		1. Did the study address a clearly focused issue?	2. Was the cohort (sample) recruited in an acceptable way?	3. Was the exposure accurately measured to minimise bias?	4. Was the outcome accurately measured to minimise bias?	5. (a) Have the authors identified all important confounding factors?	5. (b) Have they taken account of the confounding factors in the design and/or analysis?	6. (a) Was the follow up of subjects complete enough?	6. (b) Was the follow up of subjects long enough?	7. What are the results of this study?	8. How precise are the results?	9. Do you believe the results?	10. Can the results be applied to the local population?	11. Do the results of this study fit with other available evidence?	12. What are the implications of this study for practice?
CROSS-SECTIONAL STUDIES															
Hu et al. (2016)	YES	YES	YES	YES	YES	NO	NO	N/A	N/A	extracted data table	Accurate	YES	YES	YES	YES
	CAN'T TELL														
	NO														
Kepple (2018)	YES	YES	YES	YES	NO	YES	N/A	N/A	extracted data table	Accurate	YES	YES	YES	YES	YES
	CAN'T TELL														
	NO														
Kula (2017)	YES	YES	YES	YES	NO	YES	N/A	N/A	extracted data table	Accurate	YES	YES	YES	YES	YES
	CAN'T TELL														
	NO														
Kumar & Kamalanabhan (2017)	YES	YES	NO	YES	YES	NO	NO	N/A	N/A	extracted data table	Accurate	YES	YES	YES	YES
	CAN'T TELL														
	NO														
Martinussen et al. (2007)	YES	YES	YES	YES	NO	YES	N/A	N/A	extracted data table	Accurate	CAN'T TELL	YES	YES	NO	NO
	CAN'T TELL														
	NO														
Medina (2007)	YES	YES	YES	YES	YES	YES	YES	N/A	N/A	extracted data table	Accurate	YES	YES	YES	YES
	CAN'T TELL														
	NO														
Mella & Boutin (2013)	YES	YES	NO	YES	YES	NO	YES	N/A	N/A	extracted data table	Accurate	YES	NO	YES	NO
	CAN'T TELL														
	NO														
Mike (2021)	YES	YES	YES	YES	NO	NO	N/A	N/A	extracted data table	Accurate	YES	YES	YES	YES	YES
	CAN'T TELL														
	NO														
Miller et al. (2017)	YES	YES	YES	YES	YES	YES	YES	N/A	N/A	extracted data table	Accurate	YES	YES	YES	YES
	CAN'T TELL														
	NO														
Mostert & Rothmann (2006)	YES	YES	YES	YES	YES	NO	YES	N/A	N/A	extracted data table	Accurate	YES	YES	YES	YES
	CAN'T TELL														
	NO														

Appendix I – Quality assessment of the included studies

Author, year	Ratings	SECTION A: Study validity								SECTION B: Results precision			SECTION C: Contribution to local context		
		1. Did the study address a clearly focused issue?	2. Was the cohort (sample) recruited in an acceptable way?	3. Was the exposure accurately measured to minimise bias?	4. Was the outcome accurately measured to minimise bias?	5. (a) Have the authors identified all important confounding factors?	5. (b) Have they taken account of the confounding factors in the design and/or analysis?	6. (a) Was the follow up of subjects complete enough?	6. (b) Was the follow up of subjects long enough?	7. What are the results of this study?	8. How precise are the results?	9. Do you believe the results?	10. Can the results be applied to the local population?	11. Do the results of this study fit with other available evidence?	12. What are the implications of this study for practice?
CROSS-SECTIONAL STUDIES															
Nascimento et al. (2020)	YES CAN'T TELL NO	YES	YES	YES	YES	NO	YES	N/A	N/A	extracted data table	Accurate	YES	YES	YES	NO
Padyab et al (2016)	YES CAN'T TELL NO	YES	YES	YES	YES	NO	YES	N/A	N/A	extracted data table	Accurate	YES	YES	YES	NO
Ricca (2004)	YES CAN'T TELL NO	YES	NO	YES	YES	NO	NO	N/A	N/A	extracted data table	Accurate	YES	YES	YES	YES
Richardson et al. (2006)	YES CAN'T TELL NO	YES	CAN'T TELL	YES	YES	NO	YES	N/A	N/A	extracted data table	Accurate	YES	YES	YES	YES
Santa Maria et al. (2019)	YES CAN'T TELL NO	YES	YES	YES	YES	NO	NO	N/A	N/A	extracted data table	Accurate	YES	YES	YES	YES
Smoktunowicz et al. (2015)	YES CAN'T TELL NO	YES	YES	YES	YES	NO	YES	N/A	N/A	extracted data table	Accurate	YES	YES	YES	NO
Tang & Lau (1996)	YES CAN'T TELL NO	YES	CAN'T TELL	YES	YES	NO	YES	N/A	N/A	extracted data table	Accurate	YES	YES	YES	NO
Valieiev et al. (2019)	YES CAN'T TELL NO	YES	YES	YES	YES	NO	NO	N/A	N/A	extracted data table	Accurate	YES	YES	YES	NO
Violanti et al. (2018)	YES CAN'T TELL NO	YES	YES	YES	YES	NO	YES	N/A	N/A	extracted data table	Accurate	YES	YES	YES	YES
Yang et al. (2019)	YES CAN'T TELL NO	YES	YES	YES	YES	NO	YES	N/A	N/A	extracted data table	Accurate	YES	YES	YES	YES
LONGITUDINAL STUDY															
Hu et al. (2017)	YES CAN'T TELL NO	YES	CAN'T TELL	YES	YES	NO	YES	NO	YES	extracted data table	Accurate	YES	YES	YES	YES

Appendix II – Justifications for exclusion of full-text screened studies

AUTHORS	TITLE	REASONS FOR EXCLUSION
Adams & Mastracci (2019)	Police body-worn cameras: Effects on officers' burnout and perceived organisational support	Partial use of burnout's sub-scale items
Andreescu & Vito (2021)	Strain, negative emotions and turnover intentions among American police managers	Partial use of burnout's sub-scale items
Argentero & Setti (2008)	Job perception, work conditions and burnout in emergency workers	Does not meet research question
Baek et al. (2021)	The Impact of Social Support and Occupational Stress on Burnout in the Trinidad and Tobago Police Service	Partial use of burnout's sub-scale items
Bakker et al. (2006)	Crossover of Burnout and Engagement in Work Teams	Not Police Officers
Bannerman (1997)	Female police officers: The relationship between social support, interactional style, and occupational stress and strain	Does not meet research question
Buerger et al. (1999)	Extending the police role: Implications of police mediation as a problem-solving tool	Not a primary study
Burke (1994)	Stressful events, work-family conflict, coping, psychological burnout, and well-being among police officers	Burnout was approached as an independent variable.
Burke et al. (1984)	Career Orientations and Burnout in Police Officers	Does not meet research question
Burke & Deszca (1986)	Correlates of psychological burnout phases among police officers	Burnout was approached as an independent variable.
de Haas et al. (2009)	Sexual Harassment and Health Among Male and Female Police Officers	Partial use of burnout's sub-scale items
Denton (2017)	The issue of burnout among police officer: The influence of job satisfaction, education and advancement	Burnout's definition is divergent from the WHO's definition
Esnard et al. (2009)	Effect of representations and conditions of activities on professional exhaustion in French police in a context of reforms	Partial use of burnout's sub-scale items
Fortune et al. (2018)	Supporting law enforcement personnel working with distressing material online	Does not meet research question
Garbarino (2016)	Work-related stress, shift and night work in the Police force	Not a primary study
Gershon et al. (2002)	Work stress in aging police officers	Partial use of burnout's sub-scale items
Griffin & Sun (2018)	Do Work-Family Conflict and Resiliency Mediate Police Stress and Burnout: a Study of State Police Officers	Partial use of burnout's sub-scale items
Houdmont (2013)	UK police custody officers' psychosocial hazard exposures and burnout	Not Police Officers
Kumar & Narula (2021)	Quantitative Demands, Burnout, and Allied Outcomes for Indian Police Officers	Partial use of burnout's sub-scale items
Kwak et al. (2018)	Emotional Labor, Role Characteristics, and Police Officer Burnout in South Korea: The Mediating Effect of Emotional Dissonance	Partial use of burnout's sub-scale items

Appendix III – PRISMA checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Cover page
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Page IV
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Page 1,2
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Page 1,2
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Page 3
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Page 2,3
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Page 2,3
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Page 3
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Page 4
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Page 3
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Page 3
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	Page 4
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	N/A
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	N/A
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	N/A
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Page 4
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	N/A

Appendix III – PRISMA checklist

Section and Topic	Item #	Checklist item	Location where item is reported
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	N/A
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	N/A
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	Page 4
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	N/A
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Page 4-6; Figure 1
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Appendix 2
Study characteristics	17	Cite each included study and present its characteristics.	Page 4-21
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Appendix 1
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	N/A
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	N/A
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	N/A
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	N/A
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	N/A
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	N/A
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	N/A
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Page 21-26
	23b	Discuss any limitations of the evidence included in the review.	Page 24
	23c	Discuss any limitations of the review processes used.	Page 24
	23d	Discuss implications of the results for practice, policy, and future research.	Page 24-26
OTHER INFORMATION			

Appendix III – PRISMA checklist

Section and Topic	Item #	Checklist item	Location where item is reported
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Page 2,3
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Page 2,3
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	N/A
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Page 27
Competing interests	26	Declare any competing interests of review authors.	Page 27
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	Table 1

Appendix IV – CASP checklist for systematic reviews



CASP Checklist: 10 questions to help you make sense of a **Systematic Review**

How to use this appraisal tool: Three broad issues need to be considered when appraising a systematic review study:

- ▶ Are the results of the study valid? (Section A)
- ▶ What are the results? (Section B)
- ▶ Will the results help locally? (Section C)

The 10 questions on the following pages are designed to help you think about these issues systematically. The first two questions are screening questions and can be answered quickly. If the answer to both is “yes”, it is worth proceeding with the remaining questions. There is some degree of overlap between the questions, you are asked to record a “yes”, “no” or “can’t tell” to most of the questions. A number of italicised prompts are given after each question. These are designed to remind you why the question is important. Record your reasons for your answers in the spaces provided.

About: These checklists were designed to be used as educational pedagogic tools, as part of a workshop setting, therefore we do not suggest a scoring system. The core CASP checklists (randomised controlled trial & systematic review) were based on JAMA ‘Users’ guides to the medical literature 1994 (adapted from Guyatt GH, Sackett DL, and Cook DJ), and piloted with health care practitioners.

For each new checklist, a group of experts were assembled to develop and pilot the checklist and the workshop format with which it would be used. Over the years overall adjustments have been made to the format, but a recent survey of checklist users reiterated that the basic format continues to be useful and appropriate.

Referencing: we recommend using the Harvard style citation, i.e.: *Critical Appraisal Skills Programme (2018). CASP (insert name of checklist i.e. Systematic Review) Checklist. [online] Available at: URL. Accessed: Date Accessed.*

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Appendix IV – CASP checklist for systematic reviews



Paper for appraisal and reference:

Section A: Are the results of the review valid?

1. Did the review address a clearly focused question?

Yes	<input checked="" type="checkbox"/>
Can't Tell	<input type="checkbox"/>
No	<input type="checkbox"/>

HINT: An issue can be 'focused' in terms of

- the population studied
- the intervention given
- the outcome considered

Comments:

The research question formulated for this review was constructed based on the PICO'S framework which allows to remember and focus on the key components of a clinical question.

2. Did the authors look for the right type of papers?

Yes	<input checked="" type="checkbox"/>
Can't Tell	<input type="checkbox"/>
No	<input type="checkbox"/>

HINT: 'The best sort of studies' would

- address the review's question
- have an appropriate study design (usually RCTs for papers evaluating interventions)

Comments:

A rigorous search strategy was developed to identify all possible studies that would address the research question of this review. Details are available in the study.

Is it worth continuing?

3. Do you think all the important, relevant studies were included?

Yes	<input checked="" type="checkbox"/>
Can't Tell	<input type="checkbox"/>
No	<input type="checkbox"/>

HINT: Look for

- which bibliographic databases were used
- follow up from reference lists
- personal contact with experts
- unpublished as well as published studies
- non-English language studies

Comments:

Four reliable databases were searched for possible studies. The search strategy was constantly tested and improved until it was not possible to obtain further studies concerning the topic under research. No language or timeline restrictions were made, increasing the width and sensitivity of the review's search.

Appendix IV – CASP checklist for systematic reviews



4. Did the review's authors do enough to assess quality of the included studies?

Yes	<input checked="" type="checkbox"/>
Can't Tell	<input type="checkbox"/>
No	<input type="checkbox"/>

HINT: The authors need to consider the rigour of the studies they have identified. Lack of rigour may affect the studies' results ("All that glisters is not gold" Merchant of Venice – Act II Scene 7)

Comments: Quality assessment of the included studies was addressed using a validated tool (CASP checklist for cohort studies). Four researchers approached this task in which two attributed ratings independently and other two supervised and solved any disagreements.

5. If the results of the review have been combined, was it reasonable to do so?

Yes	<input checked="" type="checkbox"/>
Can't Tell	<input type="checkbox"/>
No	<input type="checkbox"/>

HINT: Consider whether

- results were similar from study to study
- results of all the included studies are clearly displayed
- results of different studies are similar
- reasons for any variations in results are discussed

Comments: The aim of this review was to identify any factors that could be associated with burnout in a positive or negative way. Most of the studies included revealed similar results between them. As for those that showed different conclusions, a discussion was carried out to find justifications for such results. The literature provides evidence for such differences and other reviews also report similar results.

Section B: What are the results?

6. What are the overall results of the review?

HINT: Consider

- If you are clear about the review's 'bottom line' results
- what these are (numerically if appropriate)
- how were the results expressed (NNT, odds ratio etc.)

Comments: It was found that occupational and social factors seem to have a greater impact over burnout development. Individual factors such as personality traits and coping strategies also revealed to be important in this matter. On the other hand, socio-demographic factors do not seem to play a big role in the development of burnout in police officers.

Appendix IV – CASP checklist for systematic reviews



7. How precise are the results?

HINT: Look at the confidence intervals, if given

Comments: This systematic review does not report confidence intervals as the research question was focusing only in the identification of factors associated with burnout, and not in the estimation of effect of a certain intervention. The interpretation of the findings was conducted in a narrative way.

Section C: Will the results help locally?

8. Can the results be applied to the local population?

Yes	<input checked="" type="checkbox"/>
Can't Tell	<input type="checkbox"/>
No	<input type="checkbox"/>

HINT: Consider whether

- the patients covered by the review could be sufficiently different to your population to cause concern
- your local setting is likely to differ much from that of the review

Comments: The included studies were conducted in different countries across the world, in different police institutions and under different socio-cultural and crime contexts which makes this review representative.

9. Were all important outcomes considered?

Yes	<input checked="" type="checkbox"/>
Can't Tell	<input type="checkbox"/>
No	<input type="checkbox"/>

HINT: Consider whether

- there is other information you would like to have seen

Comments: This review proposed the identification of risk and protective factors associated with police officer burnout. There are no other findings of interest related to the aim of this research.

10. Are the benefits worth the harms and costs?

Yes	<input checked="" type="checkbox"/>
Can't Tell	<input type="checkbox"/>
No	<input type="checkbox"/>

HINT: Consider

- even if this is not addressed by the review, what do **you** think?

Comments: Having this kind of knowledge is of great importance, as this is the only way to design prevention and intervention strategies for these professionals and to raise awareness among policy makers to change the way burnout and possibly mental health in general is approached in this occupational sector.

Appendix V – Presentations and publications linked with this study

- 1.** Oral communication of this study's project to the students of the second year of the MSc in Legal Medicine on April 2nd, 2022.
- 2.** Training session on how to prepare a systematic review of literature to the students of the second year of the MSc in Legal Medicine on November 11th, 2021 and November 12th, 2022.
- 3.** Oral communication of the theme “Psychosocial risk and protective factors associated with burnout in police officers: a systematic review” in the IJUP (Investigação Jovem da Universidade do Porto) congress on May 4th, 2022.
- 4.** The article by Lucas Alves, Lee Abreo, Eleni Petkari and Mariana Pinto da Costa with the title “Psychosocial risk and protective factors associated with burnout in police officers: a systematic review” was submitted for publication (under review).