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Assessing Research Trajectories in Border Services Personnel's Safety, Health, and Well-Being: An Integrated Scientometric and Scoping Analysis (2000–2025)

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ARTICLE INFO	ABSTRACT
	This review provides the first integrated scientometric–scoping synthesis of global research on the safety, health, and well-being of border services personnel from 2000 to 2025. Using ScientoPy and VOSviewer, publication trends and thematic evolutions were mapped from Scopus and Web of Science, while a SPIDER-guided scoping analysis consolidated empirical insights across high-risk border environments. This dual-lens approach uncovers a previously unreported shift in the field: research has moved decisively from traditional clinical and health-service perspectives toward psychologically driven, behaviour-based models centred on mental health, stress, and adaptive well-being. A key contribution of this review is the identification of the Theory of Planned Behaviour (TPB) as an emergent, dominant framework shaping contemporary scholarship, highlighting a new paradigm that emphasises attitudes, subjective norms, and perceived behavioural control in explaining safety and mental health behaviours among border personnel. The review also proposes a forward-looking research agenda addressing overlooked areas, including social support systems, organisational climate, cultural influences, and resilience-building interventions. By establishing the intellectual evolution, exposing critical blind spots, and proposing a behavioural-science–anchored research direction, this review offers a novel roadmap for advancing evidence-based strategies to strengthen the operational readiness and well-being of border services personnel.

1. Introduction

Border services personnel stand at one of the most complex intersections of modern governance—where human mobility, national security, public health, and cultural diversity meet. Their work is far more than checking passports or enforcing immigration laws; it involves managing the fluid dynamics of migration, interpreting ever-changing policies, and interacting daily with people from a wide range of cultural and social backgrounds. Much of this work happens behind the scenes. Mobility intermediaries such as local guides, agents, and administrative brokers often bridge

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travellers with border bureaucracies, but it is frontline personnel who ultimately navigate opaque procedures and restrictive regimes [1]. The COVID-19 pandemic further magnified the visibility and vulnerability of border services. The use of "border hotels" as quarantine and detention sites highlighted how border spaces became extensions of public health governance and political control [2]. In Malaysia, digitalisation rapidly accelerated; contact-tracing applications and technological monitoring tools were introduced at border entry points, reflecting the country's innovation in managing a global health crisis [3]. At the same time, border enforcement increasingly extended inland as national security concerns reframed migration control as an integrated component of homeland policing [4]. Together, these developments underscore the strategic importance of border personnel who must maintain security, uphold legal processes, and respond to emerging public health threats, all while mediating the cultural and communicative challenges of diverse populations [5].

Yet, behind these demanding responsibilities lies an occupational reality that is often overlooked. Border personnel routinely face potentially traumatic encounters—interactions with criminal networks, exposure to distressing events, and high-stakes decision making—placing them at elevated risk of stress and post-traumatic stress injuries [6,7]. Interventions such as Emotional Resilience Skills Training (ERST) show promise in strengthening coping capacity, but the broader psychosocial environment also matters. Job satisfaction, self-efficacy, and supportive organisational cultures contribute significantly to psychological well-being and operational readiness [8,9]. Their role in border health control—crucial for preventing infectious disease spread—adds another layer of pressure, requiring constant vigilance and specialised training [10]. Compounding these challenges are environmental, operational, and organisational risks. Border officers are exposed to heat, carbon monoxide, infectious agents, and hazardous working conditions that heighten both physical and mental strain [11,12]. Poor management practices, fatigue, stigma, inadequate resources, and negative public attitudes further contribute to a cycle of occupational stress and diminished resilience [13]. In short, the border environment is a high-demand ecosystem where safety, health, and well-being are constantly negotiated but not always protected.

Despite the intensity of these challenges, the literature addressing the safety and well-being of border personnel remains surprisingly limited. Much of what is known comes indirectly from research on migrant workers, farm workers, humanitarian responders, or maritime workers—groups who face similar stressors but operate in different contexts [6,14,15]. Studies on the psychological effects of border closures during COVID-19 reveal widespread distress, yet they mainly focus on travellers or the general public, not the personnel enforcing these measures [16]. This mismatch highlights a significant gap: we know a great deal about those who cross borders, but far less about those who guard them. Given these gaps, there is a clear need to systematically map how research on border personnel has evolved, what themes dominate the field, and where critical blind spots remain. Integrating scientometric and scoping approaches provides a way to achieve this. Scientometric analysis offers quantitative insight into publication trends, influential works, and emerging concepts, while a scoping review allows a deeper qualitative understanding of the lived experiences, conceptual frameworks, and methodological patterns present in literature. Together, these complementary lenses allow for a comprehensive, interdisciplinary view of the landscape—one that not only charts what is known but also illuminates what has been overlooked and what urgently requires future investigation.

2. Methodology

2.1 Scientometric Analysis

Scientometric analysis serves as a recognised method for the examination and understanding of extensive scientific data. This method facilitates a comprehensive understanding of developmental pathways within specific domains [17]. The use of scientometric metrics to assess the quality of research output is increasing. Researchers employ scientometric analysis for various purposes, such as identifying emerging trends and evaluating journal performance [18]. This method is employed to analyse collaboration patterns and research components [19], evaluate publication trends in specific fields, and explore the intellectual framework of certain domains via published literature [20]. This study utilises scientometric analysis to identify patterns in research publications concerning safety, health, and well-being among border services personnel, pinpoint countries that are actively contributing to this field, and analyse the themes and sub-themes reflected in authors' keywords.

2.2 Scoping Analysis

The primary objective of scoping reviews is to systematically collect and document a comprehensive array of available evidence [21]. Consequently, this study aims to conduct a thorough analysis of the key factors pertaining to safety, health, and well-being among border services personnel, while also synthesising the extant research in this domain. This scoping review was undertaken to identify areas requiring further exploration and to highlight gaps in the current body of knowledge. The study adhered to the established five-step scoping review framework developed by Arksey and O'Malley [22].

1) Establish the research question.
2) Identify relevant studies.
3) Select studies.
4) Chart the data.
5) Report the results.

2.3 Establishing the Research Question

The research question presented below serves as the basis for the scoping analysis carried out in this study:

> 1) Employing the SPIDER (Sample, Phenomenon of Interest, Design, Evaluation, Research Type) framework as outlined by Cooke et al. [23], what are the key findings from the current literature concerning safety, health, and well-being among border services personnel?

2.4 Identifying Relevant Studies
2.4.1 Database

Accessing scientific journal publications, institutional repositories, archives, and other collections necessitates the use of databases and search engines. In this study, we utilised the Scopus and Web of Science (WoS) databases to analyse scientometric and scoping indicators. These databases were selected due to their superior focus on document citations compared to other resources [24]. To enhance the validity of our coverage analysis, we implemented several improvements, including

refining metadata accuracy, categorising document types, and assigning relevant disciplines. Consequently, Scopus and WoS emphasise these aspects.

2.4.2 Search strategy

Subsequent to the selection of keywords, an encyclopaedia was consulted to identify synonymous terms.Table 1 delineates the search phrases employed to generate publication listings from the Scopus and WoS databases.The search was conducted in July2025 and encompassed titles, abstracts, and keywords from both databases. No limitations were imposed on the acquired data, including criteria related to date, publication type, or language.

Table 1
Search strategy for data extraction from the Web of Science and Scopus databases

Database	Search Strategy	Records
Web of Science	Topic: ("safety" OR "security" OR "protection" OR "risk") AND ("health" OR "well-being" OR "wellness" OR "fitness") AND ("border services" OR "customs" OR "immigration" OR "frontier" OR "border military" OR "border police") AND ("personnel" OR "staff" OR "employees" OR "workers") AND ("stress" OR "mental health" OR "psychological" OR "emotional") AND ("training" OR "support" OR "intervention" OR "resources")	58
Scopus	Article Title, Abstract, Keywords: ("safety" OR "security" OR "protection" OR "risk") AND ("health" OR "well-being" OR "wellness" OR "fitness") AND ("border services" OR "customs" OR "immigration" OR "frontier" OR "border military" OR "border police") AND ("personnel" OR "staff" OR "employees" OR "workers") AND ("stress" OR "mental health" OR "psychological" OR "emotional") AND ("training" OR "support" OR "intervention" OR "resources")	180

2.4.3 Software

ScientoPy and VOSviewer are two prominent research tools widely used in academic environments. ScientoPy, implemented as a Python script, retrieves relevant information from research papers, including key subjects, authors, countries, and related documents. It utilises keywords provided by authors to generate insights and address potential biases that may arise from isolated studies. However, it is essential to acknowledge that evaluating papers based on author names may still introduce bias, particularly when names are similar. Furthermore, ScientoPy's analysis is restricted to theories explicitly mentioned in abstracts, keywords, and titles, which suggests that theories not acknowledged by previous authors may go unrecognised [25]. Identifying these overlooked ideas can yield new insights into topics and highlight relevant areas for further investigation. VOSviewer, is a software tool designed for co-occurrence studies of terms, particularly in relation to sensation seeking in driving behaviour. It employs advanced mapping methodologies to transform CSV data into visually meaningful graphs or clusters [26]. These mapping methodologies provide significant advantages for researchers aiming to study specific data points, such as authors' keywords [25].

2.5 Selecting Studies
2.5.1 Merging Publications and Removing Duplicates

Data from both databases were aggregated and analysed using ScientoPy.In this step, the data were standardised by replacing commas in authors' names with semicolons, removing periods and distinctive formatting, and eliminating duplicate entries with identical titles and authors.This methodological approach enhances the accuracy and reliability of the datasets.Diagram 1 illustrates the outcomes of the preprocessed data.
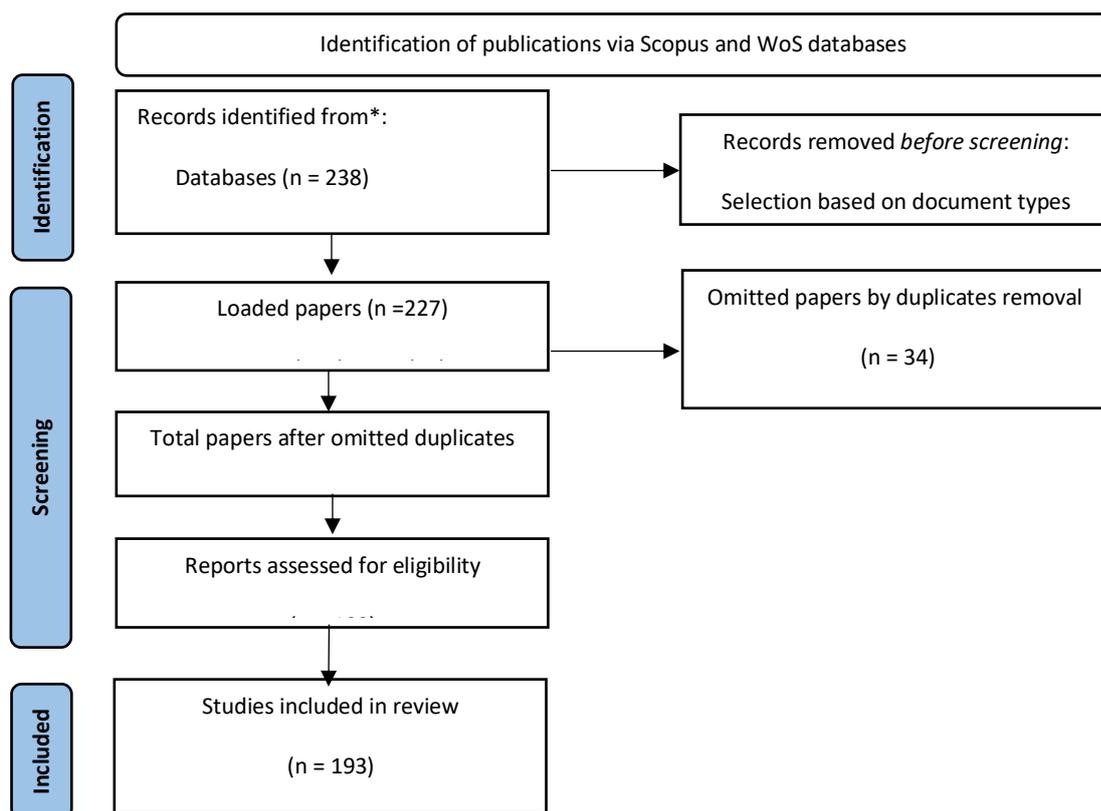

Fig. 1. Flow diagram of research of databases and registers

The preprocessing script employed in ScientoPy places a greater emphasis on documents obtained from the WoS in comparison to those from Scopus. Figure 1 illustrates the initial document screening and deduplication process for literature concerning safety, health, and well-being among border services personnel. This study utilises two main databases: Scopus and WoS. Scopus initially provided a greater quantity of loaded documents; however, approximately 20% of these were identified as duplicates and subsequently eliminated during the deduplication process. In contrast, WoS provided a smaller dataset, with no duplicates detected. This suggests that Scopus offers wider coverage while exhibiting considerable overlap with WoS, underscoring the importance of meticulous deduplication to prevent bias and redundancy in scientometric and scoping analyses. The figure highlights the necessity of integrating various databases to attain thorough coverage, while methodically eliminating duplicates to guarantee precision in evaluating research trajectories within this field.

Figure 1 illustrates that the source dataset consists of 238 papers obtained from the WoS and Scopus databases. ScientoPy categorises these publications into various classifications, including

conference papers, essays, reviews, proceedings papers, and press releases. As a result, two documents, which include books, letters, and errata, were excluded from the analysis. This study utilised a total of 193 items from both databases, comprising 58 papers from WoS and 135 from Scopus, after data reconciliation. Additionally, 34 duplicate entries from Scopus and one from WoS were removed.

2.6 Data Charting

The publication growth graph illustrates the evolution of publishing within the Scopus and WoS databases, which is essential for comprehending overarching publication trends. To further refine our analysis of the articles identified in the preceding phase, we will examine the evolution graph of the top ten authors' keywords and analyse the co-occurrence of these keywords.

2.7 Reporting Results

In accordance with the study's objectives, a concise summary and report of the findings were prepared. ScientoPy was employed to analyse publication growth, identify active countries, and examine keywords. VOSviewer served as a descriptive tool to assess the co-occurrence of authors' keywords, noting that a minimum of two keywords is required to generate co-occurrence results in the software. Additionally, thesaurus files were carefully reviewed and modified in accordance with the recommendations of Abdullah *et al*., [26] to prevent the duplication of authors' keywords.

The methodology for this study is a scoping review, designed to provide a comprehensive overview of existing research within a specific field. A primary objective of conducting a scoping study is to identify gaps or deficiencies in the current literature. This investigation aimed to systematically examine and characterise the existing research on safety, health, and well-being among border services personnel and to identify areas where the literature is lacking. To facilitate this analysis, articles sourced from Scopus and WoS were pre-processed using ScientoPy. The specific inclusion criteria for this scoping review are detailed in Table 2.

1) Composed in the English language.
2) Publications from 2010 onwards.
3) Discuss original research.
4) Include the term 'well-being' in the authors' keywords.

3. Results
3.1 Scientometric Outcomes
3.1.1 Publication growth

Figure 2 illustrates the growth in publications pertaining to safety, health, and well-being among border services personnel, comparing outputs from Scopus and Web of Science (WoS) from 2001 to 2025. The graph reveals initially low and intermittent publication patterns across both databases, with Scopus consistently producing a slightly higher number of documents than WoS until approximately 2019. Notably, from 2020 onwards, a substantial and sustained increase is observed in both databases, peaking dramatically in recent years (2022–2025) with up to 10 documents published annually. This surge in scholarly interest is likely driven by global issues such as the COVID-19 pandemic, heightened migration pressures, and increased attention to personnel welfare. Although both databases reflect similar growth trajectories, Scopus demonstrates earlier and more

consistent coverage, whereas WoS exhibits sharper fluctuations. These findings underscore a pronounced recent emphasis on research aimed at comprehensively understanding and enhancing the occupational safety, health, and psychological well-being of border personnel.

The increasing volume of research concerning the safety, health, and well-being of border services personnel is driven by several factors, including heightened global security concerns, escalating migration flows, and intensified border operations due to geopolitical tensions. These factors contribute to the occupational hazards and mental health risks faced by frontline border workers. Research indicates that border security personnel are frequently exposed to traumatic events, such as interactions with criminals and witnessing tragedies related to trafficking, which significantly impact their mental health and well-being [6]. The COVID-19 pandemic further exacerbated these challenges, as strict border closures resulted in elevated levels of psychological distress among individuals affected by these measures, indicating broader mental health implications of border operations [16]. Frontline workers, including those in border services, have reported experiencing stress, anxiety, depression, and burnout due to direct exposure to COVID-19, isolation, and limited resources, underscoring the need for targeted mental health support [27,28]. Moreover, the workplace environment itself poses various hazards, including organisational risk factors that can affect workers' safety and well-being [13]. Addressing these issues necessitates fostering a supportive organisational culture, reducing mental health stigma, and encouraging help-seeking behaviours to enhance resilience among border security personnel [6]. Overall, the recognition of these occupational hazards and mental health risks is crucial for developing effective interventions and policies to support the well-being of border services personnel in the face of ongoing global challenges.

3.1.2 The most influential academic works

Figure 2 provides an overview of the most influential academic institutions contributing to research on safety, health, and well-being among border services personnel, highlighting the distribution of their publications before and after 2024. Harvard Medical School and Massachusetts General Hospital (USA), Texas A&M University (USA), and the University of Turin (Italy) have shown significant recent activity, with 50% of their contributions published between 2024 and 2025. This trend suggests that these institutions are at the forefront of emerging research trajectories, likely due to targeted funding, increased scholarly interest, or a focus on issues related to border personnel. In contrast, Pompeu Fabra University (Spain), the University of Melbourne (Australia), the University of Miami (USA), the University of Montreal (Canada), the University of Regina (Canada), and Western University (Canada) reported no recent publications (0% between 2024 and 2025), indicating that their contributions occurred earlier, likely establishing foundational frameworks or pioneering initial investigations within this research area. This distribution highlights the emergence of institutional leadership alongside well-established contributions, shaping the academic landscape regarding the well-being of border personnel.
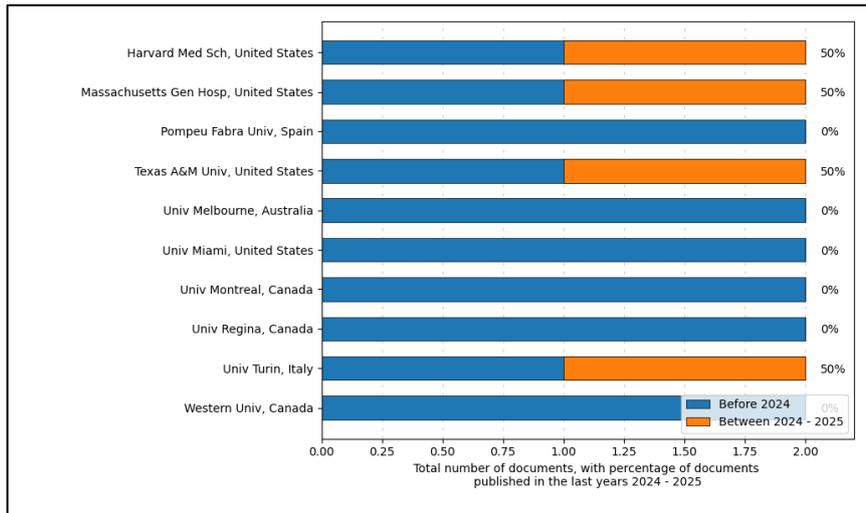
Fig. 2. Institution bar trends graph

3.1.3 Authors' keywords

Figure 3 provides a comprehensive overview of the authors' keywords employed in publications pertaining to safety, health, and well-being among border services personnel. It delineates both the total document counts and recent publication trends for the years 2024–2025. Mental health emerges as the most frequently utilised keyword, with over 20 publications and a significant recent increase of 19%. This trend indicates a sustained and expanding scholarly interest in the psychological challenges confronted by border personnel. Other noteworthy keywords include COVID-19, which has experienced a marked recent rise in research (22%), underscoring the ongoing impact of the pandemic on border staff. Furthermore, keywords such as qualitative research (40%), well-being (33%), and immigration (33%) demonstrate considerable recent engagement, suggesting a shift towards more nuanced, qualitative examinations of personnel experiences and the challenges associated with immigration-related pressures. In contrast, keywords like social support and culture have not yielded any new publications during the recent period, indicating potential gaps or saturation in those areas. These findings highlight a clear shift towards mental health, qualitative approaches, and immigration contexts, emphasising human-centred perspectives in contemporary research on border services personnel.
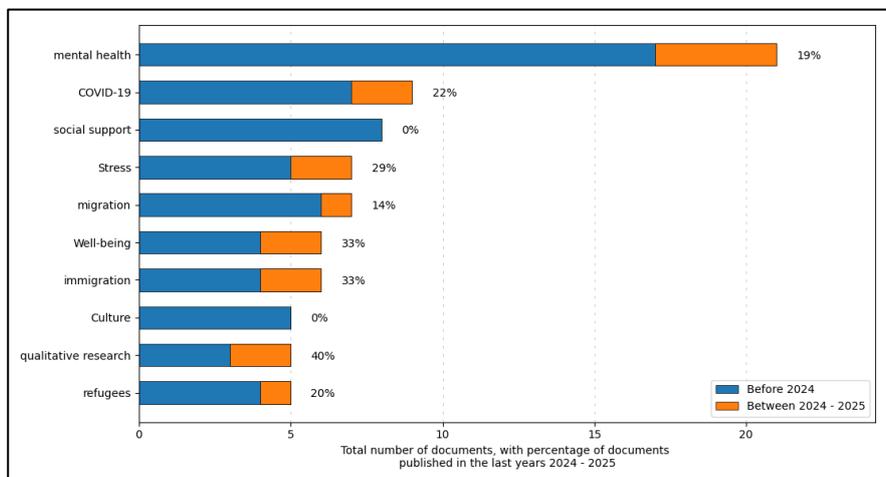

Fig. 3. The bar-trend graph of research themes and topics emerging (Source: Author, using ScientoPy 2.1.3).

Figure 4 presents an overlay visualisation of keyword co-occurrence related to safety, health, and well-being among border services personnel, employing temporal colouring to illustrate the evolution of research focus from 2016 to 2022. The central and most prominent keyword is "mental health," which serves as the primary node linking to several key themes such as "stress," "social support," "COVID-19," "migration," "culture," "immigration," and "well-being." Early-stage research (indicated in blue to light blue), such as studies on "culture," "social support," and "migration," reflects foundational work exploring sociocultural dimensions and adjustment stressors. As the timeline progresses towards green and yellow hues, a shift is observable towards "stress," "well-being," and "immigration," signifying a growing concern with psychosocial impacts and adaptation. The most recent contributions (orange to red) cluster around "COVID-19" and its direct associations with "mental health" and "stress," suggesting that the pandemic has intensified scholarly focus on the psychological toll experienced by border personnel. Notably, "qualitative research" and "refugees" are closely linked to "well-being," representing an increasing interest in lived experiences and humanitarian dimensions. This visual network highlights how research has evolved from general socio-psychological themes towards acute, event-driven concerns, with mental health consistently anchoring the scholarly discourse over time.
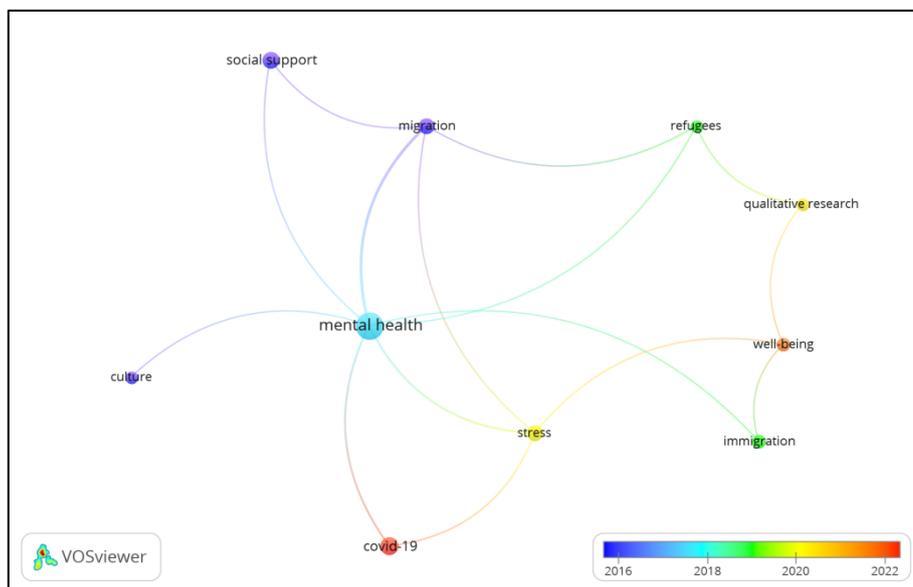

Fig. 4. Co-occurrence of authors' keywords

3.1.4 Foundational theories

Figure 5 illustrates the foundational theories underpinning research on safety, health, and well-being among border services personnel, highlighting both historical and contemporary theoretical applications. The data reveals that the Theory of Planned Behaviour (TPB) has notably emerged in the most recent research period (2024–2025), accounting for 100% of its associated publications. This indicates a growing scholarly inclination towards understanding behavioural intentions, attitudes, and perceived control in shaping safety and health practices among border staff. In contrast, nursing theory, which was applied in earlier literature, has shown 0% usage in the latest period, suggesting a shift away from clinical or health service delivery frameworks towards psychologically driven, decision-based models. This trend reflects an increased interest in behavioural science approaches to occupational safety and well-being in high-stakes border environments, aligning with broader efforts to incorporate psychosocial dynamics and proactive

behaviour models into organisational safety strategies. The exclusive rise of TPB also highlights an evolving research agenda that values individual agency, cognitive processes, and motivational factors in managing stress, promoting mental health, and ensuring compliance with safety protocols in border service contexts.
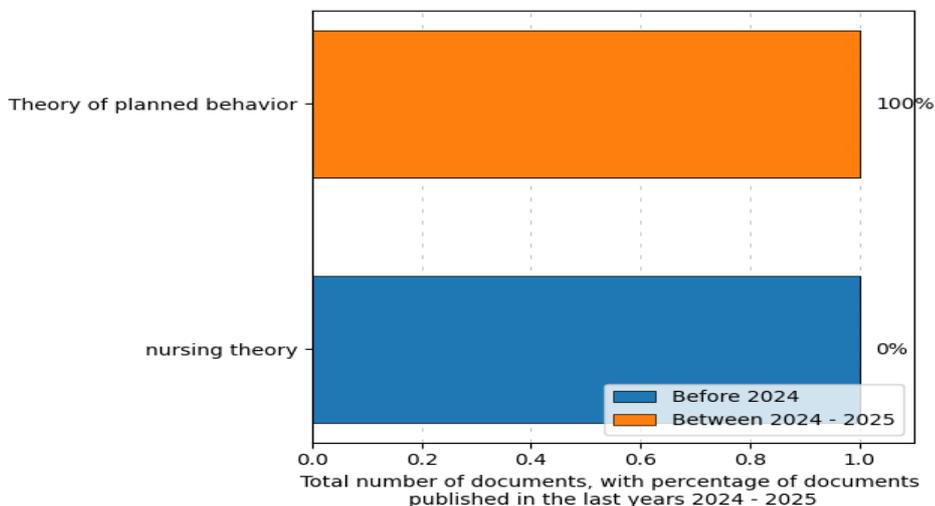

Fig. 5. The bar-trend graph of foundational theories (Source: Author, using ScientoPy 2.1.3).

3.2 Scoping Outcomes

This section offers a thorough examination of how well-being is addressed in the literature concerning safety, health, and well-being among border services personnel. This analysis serves as a crucial initial step in identifying knowledge gaps and guiding future research, ultimately enhancing the existing body of knowledge and best practices. To conduct this scoping analysis, qualitative research questions were formulated, and the SPIDER tool was utilised as the search strategy. Table 2 presents publications based on extended author keywords sourced from ScientoPy, which includes a total of five documents. It is important to note that this study specifically focuses on the scoping analysis of research articles, six papers were excluded because they were non-empirical (commentaries, conceptual articles, or editorials). The final five studies therefore accurately represent the small but current evidence base available in this underexplored field.

4. Discussions

The findings of this study illustrate a complex relationship between the mental health of border services personnel and the evolving psychosocial, cultural, and pandemic-related stressors. This is evidenced by the keyword and thematic analyses, which highlight the interconnected themes of stress, well-being, migration, and COVID-19 over time. The COVID-19 pandemic has intensified mental health challenges for individuals affected by border closures. For instance, in Australia, individuals unable to cross borders for personal or economic reasons reported high levels of psychological distress and poor mental well-being [16]. Similarly, stranded immigrants in Mexico faced significant mental health challenges due to prolonged uncertainty and fear of violence, further exacerbated by the pandemic's impact [34]. In Portugal, migrants experienced increased anxiety and sadness, with vulnerability noted among women and those with insecure income or residence status [35]. Frontline healthcare workers at entry points in Pakistan also reported heightened levels of depression, anxiety, and stress due to the demands and risks associated with the pandemic [36].

Refugees in Australia encountered unique stressors, with COVID-19 serving as a reminder of past traumas, resulting in increased health anxiety and post-traumatic stress disorder [37]. Collectively, these studies underscore the intricate interplay of stress, well-being, migration, and COVID-19, highlighting the need for targeted mental health interventions for border services personnel and other vulnerable groups.

The topic of well-being is of significant academic interest, particularly concerning the mental health of border services personnel, and warrants further exploration. The demanding and high-risk nature of border services work substantially impacts personnel well-being, primarily through stress and burnout. These individuals are frequently exposed to traumatic events, such as encounters with criminals and witnessing tragedies associated with trafficking, which exacerbate their mental health challenges [6]. Identified stressors include poor management, inadequate staffing, and negative public attitudes, all of which are further complicated by the moral dilemmas unique to their roles [6]. The severity of stress among Border Guard officers is influenced by their perceived control over their work, the rewards they receive, and their workload. These factors account for a significant portion of the variability in stress levels [38]. Furthermore, psychological well-being is associated with professional self-acceptance, satisfaction with achievements, and positive workplace relationships, all of which can enhance resilience and reduce burnout [8]. However, barriers to seeking help, such as concerns regarding trust and confidentiality, limit the utilisation of internal support systems, leading personnel to rely on colleagues for support during high-stress periods [39]. Addressing these issues through the promotion of supportive organisational cultures and the reduction of stigma surrounding help-seeking can improve the mental health and well-being of border service personnel.

To gain a deeper understanding of how psychosocial, cultural, and occupational stressors impact the mental health and overall well-being of border services personnel, this study employs keyword and thematic analyses. This approach highlights the shift in research focus from sociocultural factors and support systems to the psychological challenges driven by the pandemic. Traditionally, stressors faced by border security personnel include poor management, fatigue, negative public attitudes, inadequate resources, and exposure to moral dilemmas. While these issues are common in law enforcement, they are particularly pronounced in border security roles due to their unique challenges [6]. The pandemic has introduced additional stress, particularly through strict border closures, which have led to increased psychological distress among affected individuals, including border personnel. This distress is marked by heightened levels of anxiety and a decline in mental well-being, as shown in studies of those impacted by border restrictions in Australia [16]. Moreover, the pandemic has intensified existing mental health challenges for frontline workers, including healthcare personnel, who have experienced rising anxiety, fear, and economic repercussions. These factors highlight the necessity for resilience and social support systems to cope with these stressors [40]. During the pandemic, the broader research focus has shifted towards understanding these psychological challenges, with significant attention given to the mental health of medical staff, the effects of isolation, and the role of telehealth. This underscores the need for targeted interventions and support systems to enhance resilience among affected groups. The evolving research landscape emphasises the importance of addressing both traditional and pandemic-specific stressors to effectively support the mental health and well-being of border services personnel.

The theoretical implications are framed through the Theory of Planned Behaviour (TPB), which provides a foundational perspective on how the attitudes, subjective norms, and perceived behavioural control of border personnel collectively influence their intentions and actual practices related to safety compliance, mental health management, and overall well-being in high-pressure operational environments. Border personnel often encounter unique stressors, such as exposure to traumatic events and moral dilemmas, which can adversely affect their mental health and well-being

[6]. The TPB framework can be instrumental in designing interventions that target these specific stressors by fostering supportive organisational cultures and encouraging help-seeking behaviours, thereby enhancing resilience [6]. Furthermore, behavioural interventions that consider social and cognitive mechanisms can create ripple effects, improving not only psychological but also physical and social health outcomes [41]. The integration of the TPB with person-environment fit theory, particularly in managing work and non-work boundaries, underscores the importance of aligning individual preferences with actual behaviours to enhance well-being [42]. This approach can be particularly beneficial for border personnel, who may experience high expectations of availability and require effective boundary management strategies. Additionally, understanding the connections between work organisation, occupational stress, and mental health is crucial for developing targeted interventions that address the specific needs of border personnel, similar to strategies employed in other high-stress occupations [43]. By leveraging the TPB framework, interventions can be tailored to meet the unique challenges faced by border personnel, ultimately supporting their overall well-being and mental health.

A scoping analysis reveals that five studies published in journals indexed by Scopus and WoS from 2010 to 2025 focus on well-being among border service personnel. The findings indicate that research on safety, health, and well-being in this sector predominantly emphasises the psychosocial and occupational determinants of stress and well-being. The primary psychosocial factors affecting stress and well-being in these groups are multifaceted, encompassing both work-related and personal dimensions. The COVID-19 pandemic has exacerbated stress levels, particularly for those impacted by international border closures. High psychological distress has been reported due to separation from family and partners, as well as disruptions to employment and study plans [16]. Emergency service workers, including ambulance personnel, face unique challenges as their work often involves exposure to traumatic events and insufficient organisational support, which significantly impacts their mental health and can lead to conditions such as PTSD, depression, and anxiety [44]. The psychosocial safety climate (PSC) within organisations plays a crucial role; lower PSC levels are correlated with increased job stress and psychological distress, highlighting the need for supportive organisational policies [45]. Furthermore, during the COVID-19 pandemic, healthcare workers experienced heightened stress due to high-risk clinical exposure and inadequate family-supportive behaviours from supervisors, which were linked to higher rates of anxiety, depression, and burnout [46]. In rural health services, factors such as community relations, the nature of the workplace, and public health measures have influenced staff well-being, emphasising the importance of community engagement and effective leadership in promoting mental health [47]. Collectively, these studies underscore the necessity of comprehensive strategies that address both organisational and personal factors to enhance the well-being of border and related service personnel.

The phenomenon of interest centres on understanding how occupational stressors, psychosocial factors, and individual perceptions of well-being influence the health, safety, and psychological outcomes of personnel operating in high-demand or migration-related environments, such as border control, military, police, and healthcare services. Within the British police force, work characteristics exert both direct and indirect effects on psychological well-being through perceived job stress, with physical activity serving as a moderating factor. This suggests that interventions aimed at stress appraisal and the promotion of physical activity could enhance overall well-being [48]. Organisational stressors, including a lack of support and extended working hours, are strongly correlated with mental health issues, such as emotional exhaustion and psychological distress among police officers. This correlation indicates that policy changes targeting these stressors could lead to improvements in officer well-being and organisational effectiveness [49]. Border security personnel encounter distinctive stressors, such as negative public attitudes and moral dilemmas, which are exacerbated

by insufficient resources and support. This highlights the necessity for supportive organisational cultures and the reduction of mental health stigma to foster resilience [6]. In military settings, resilience is vital for mitigating the adverse effects of stress and presenteeism. Structural equation modelling suggests that the cultivation of resilience could enhance work capacity and diminish stress-related impacts [49]. Military personnel report higher levels of job stress compared to civilians, with a significant proportion experiencing emotional distress attributable to work-related stress. This underscores the necessity for targeted interventions to address these occupational health hazards [50]. Collectively, these findings underscore the importance of addressing both organisational and individual factors to improve the health and safety outcomes of personnel in these high-demand roles.

5. Future Research Direction

Future research on the safety, health, and well-being of border services personnel must move beyond the fragmented and indirect evidence currently available and begin treating border personnel as a distinct occupational group with unique psychological, environmental, and organisational stressors. Empirical studies—especially longitudinal or cohort-based—are needed to capture the cumulative effects of trauma exposure, shift work, operational pressures, and cross-cultural interactions. While the Theory of Planned Behaviour (TPB) has recently gained traction, researchers should broaden the theoretical landscape by testing models such as the Job Demands–Resources (JD-R) model, Psychosocial Safety Climate (PSC), Self-Determination Theory (SDT), and Conservation of Resources (COR) theory to better explain resilience, safety behaviour, and mental health outcomes in high-risk border environments. Equally important is the integration of often-overlooked determinants such as social support, organisational climate, and cultural influences—factors that are central to well-being but seldom measured in border research. There is also a strong need to design and evaluate evidence-based interventions tailored to real-world border operations, including digital mental health tools, fatigue-management systems, resilience training, and enhanced OSH protocols for biohazard and pandemic-related duties. Cross-border and regional comparative studies, particularly within ASEAN and other migration hotspots, would enable researchers to identify shared vulnerabilities and best practices while strengthening the foundation for regional policy development. Finally, as border work becomes increasingly digitalised through biometric systems, surveillance technologies, and health-monitoring applications, future studies must address emerging challenges related to techno-stress, privacy, monitoring fatigue, and autonomy. Together, these directions form a comprehensive agenda for advancing behavioural science, occupational health, and organisational policy to better support the operational readiness and holistic well-being of border services personnel.

6. Conclusion

This study employed an integrated scientometric and scoping analysis to comprehensively assess research trajectories concerning the safety, health, and well-being of border services personnel between 2000 and 2025. Using ScientoPy and VOSviewer, data were extracted from the Scopus and Web of Science (WoS) databases to identify publication growth, thematic clusters, and theoretical underpinnings, while the SPIDER framework guided the synthesis of qualitative and quantitative findings from five key studies. The scientometric results revealed a substantial increase in research output since 2020, largely influenced by the COVID-19 pandemic, which intensified academic and institutional attention to occupational stress, mental health, and adaptive well-being practices. The

keyword and co-occurrence analyses demonstrated that mental health, stress, well-being, and immigration form the dominant research foci, reflecting a progressive shift from earlier socio-cultural and clinical perspectives toward psychologically driven, behaviour-oriented frameworks. The Theory of Planned Behaviour (TPB) emerged as the most recent and influential theoretical model, highlighting the importance of attitudes, subjective norms, and perceived behavioural control in shaping personnel's safety behaviour, resilience, and mental health management. Collectively, these findings underscore the critical need for behaviour-based and psychosocial interventions to strengthen the well-being and operational readiness of border personnel in high-stakes, dynamic environments.

7. Contribution to the Body of Knowledge and Practices

This study contributes significantly to the existing body of knowledge by providing the first integrated scientometric–scoping synthesis that maps the intellectual evolution, methodological diversity, and theoretical orientation of research on border personnel's safety, health, and well-being. Empirically, it identifies a clear transition from clinical and health-service paradigms to psychological and behavioural frameworks, emphasizing the centrality of mental health, psychosocial stressors, and organizational resilience in contemporary scholarship. Theoretically, it positions the TPB as a dominant explanatory model, offering a robust lens for understanding how cognitive, attitudinal, and social factors influence safety compliance and well-being practices among border staff. Methodologically, the combination of quantitative scientometric mapping and qualitative scoping synthesis enhances research transparency and enables the identification of neglected themes such as social support, culture, and cross-border trauma. Practically, the study underscores the need for evidence-based interventions, organizational policy reforms, and mental health programs tailored to the unique occupational demands of border services. By illuminating emerging trends and research gaps, this study lays the groundwork for future investigations into resilience-building, behavioural change, and cross-sectoral occupational safety strategies, advancing both theoretical understanding and professional practice in the field.

Acknowledgement

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