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Systematic Review

The second victim phenomenon´s impact in male and female healthcare workers: a scoping review

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Abstract

Background: The second-victim phenomenon occurs when a healthcare provider experiences trauma after being profoundly affected by a negative medical event. As a work-related phenomenon, it may be influenced by sex and gender-related factors, particularly since women constitute 70% of the health and social sector workforce. This study aims to describe the impact of the second-victim phenomenon on male and female healthcare professionals, identifying differences in their experiences. It also identifies differences in the reactions and behavior of supervisors, colleagues, patients, and their relatives to errors made by male and female healthcare workers.

Methods: A scoping review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension guidelines. Comprehensive searches were performed in the electronic databases BDENF, ProQuest, PsycInfo, PubMed, Scopus, and Web of Science, without filters or time limits. Original articles in Portuguese, English, Spanish, or German that mentioned any aspects concerning differences between male and female healthcare workers in relation to the second-victim phenomenon were selected.

Results: Twenty-seven articles were included, most of which were cross-sectional studies from the USA, China, Germany, and Spain, conducted among physicians and nurses. The findings highlighted that women experienced more intense anxiety responses in the aftermath of severe adverse events than men. Male healthcare workers were more resistant to seeking support compared to their female counterparts. Gender-based discrimination against women was identified in both education and practice, further exacerbating the second victim syndrome experienced by female healthcare professionals.

Conclusion: Understanding male/female differences is essential for comprehending the second-victim phenomenon and designing effective measures to mitigate its impact. Women may be more psychologically affected by adverse events than men. They are judged more negatively than men after making an error and are more likely to seek help.

Keywords: healthcare system; human factors; healthcare worker; gender issues; patient safety; second victim

Introduction

Healthcare workers include all individuals engaged in activities primarily aimed at enhancing health outcomes, such as doctors, nurses, technicians, and therapists. By 2030, the global health workforce is expected to reach 84 million workers, driven by ongoing job creation in the health sector [1]. A sufficiently large, diverse, and resilient workforce is essential for achieving population health objectives, universal health coverage, and the health-related targets of the United Nations Sustainable Development Goals [1].

To provide optimal care, healthcare professionals require knowledge, skills, development opportunities, a proactive service attitude, and appropriate equipment [2]. They also need the capacity to cope with highly stressful events that can emotionally and physically affect them and potentially deter them from engaging in safe and high-quality care practices.

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Preventing and addressing the impact of these highly stressful events, which can lead to the second-victim phenomenon, is crucial [2]. A second victim refers to "any healthcare worker, directly or indirectly involved in an unanticipated adverse patient event, unintentional healthcare error, or patient injury, who becomes victimized in the sense that the worker is also negatively impacted" [2].

Typically, second victims experience self-doubt about their professional competence, feelings of guilt, heightened anxiety, and affective symptoms [3]. These emotional and psychological responses often lead to changes in behavior and clinical decision-making, which can compromise patient safety, affect the quality of care, and hinder the achievement of optimal health outcomes [4]. If not properly addressed, these impacts may contribute to defensive medicine, decreased professional performance, and an increased risk of further errors, ultimately affecting both the healthcare professional and future patients [5].

Women constitute 70% of the workforce in the health and social sector [6]. The active involvement of women as healthcare providers is widely acknowledged as essential for positive outcomes at the individual, family, community, and healthcare system levels [7, 8]. However, women often face challenges in reaching their full potential due to barriers such as professional hierarchies and gender-based sociocultural norms within both the family and the healthcare system [9, 10]. The World Health Organization (WHO) recognizes the presence of systemic challenges, gender biases, and inequalities within the global health and social care workforce [11].

The impact of the second-victim phenomenon on men and women has rarely been analyzed separately, considering social, educational, genetic, and biological factors. In understanding this phenomenon, it is crucial to consider differences in anxiety and depression between men and women, which are influenced by both biological and psychosocial factors. Research consistently indicates that women exhibit higher levels of anxiety than men, a difference attributed to genetic predisposition, hormonal fluctuations, and variations in brain structures that regulate stress and fear responses [12]. Additionally, psychosocial factors such as gender role socialization play a key role. Women are more likely to be encouraged to express fear and anxiety, while men are often socialized to suppress these emotions and adopt problem-solving strategies [13].

Furthermore, studies suggest that masculinity traits (e.g. assertiveness and control) may serve as protective factors against anxiety, whereas femininity traits (e.g. emotional expressivity and dependency) have been linked to higher anxiety vulnerability [12]. These differences not only impact how healthcare professionals experience stress and errors but may also influence how they cope with adverse events in clinical settings. Moreover, genetic studies on depression and anxiety comorbidity have found that women tend to have both shared and specific genetic factors contributing to their risk, whereas in men, genetic influences on depression are largely shared with anxiety-related traits [14]. Gender equality at every level is crucial for reshaping the allocation of opportunities, resources, and choices for both men and women, aiming for sustainable development and the empowerment of women across all sectors [15], especially in healthcare [10].

Given that the second-victim phenomenon involves heightened emotional distress after adverse medical events, understanding these sex-based and gender-related differences in anxiety and depression is fundamental to designing targeted support interventions for male and female healthcare professionals. Addressing both social and biological determinants can enhance personalized coping strategies, mental health interventions, and workplace policies aimed at mitigating the long-term consequences of this phenomenon and ensuring a safer and more resilient healthcare environment. This scenario raises questions such as how healthcare workers experience the second-victim phenomenon and how supervisors, colleagues, patients, and their relatives react to errors made by men and women in healthcare settings. Understanding the sex and gender-related dimensions of the second victim phenomenon is crucial for developing tailored, effective support mechanisms and fostering a safer, more equitable just culture in healthcare settings.

The main aim of this study was to describe the impact of the second victim phenomenon on male and female healthcare professionals, identifying differences in their experiences. The secondary objective was to identify potential differences in the reactions and behavior of supervisors, colleagues, patients, and their relatives to errors made by male and female healthcare workers.

Method

The Joanna Briggs Institute's (JBI) methodology for scoping reviews [16], following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) guidelines [17], was adopted for this study. The protocol was registered in OSF Registries under the number 8F4Q9 (https://osf.io/8f4q9).

The research question was formulated using the PCC framework (Population, Concept, and Context) proposed by JBI [16, 18], which in this study consisted of: Population—male and female healthcare workers who have experienced the second-victim phenomenon and their frequent symptoms; Concept—the relationship between healthcare workers' sex or gender and the second-victim phenomenon, including the reactions and behavior of supervisors, colleagues, patients, and their relatives to errors made by men and women; and Context—the healthcare settings where this population works.

Eligibility criteria

Original articles in Portuguese, English, Spanish, or German that addressed healthcare workers' gender in the context of the second victim phenomenon were included. Articles without data or discussions related to male/female differences were excluded, and articles that did not present data disaggregated or analyzed according to the sex or gender of the participants were not included.

Search strategy

Comprehensive searches were conducted in BDENF, ProQuest, PsycInfo, PubMed, Scopus, and Web of Science. Reference lists of the selected articles were also checked for additional relevant studies. Since "second victims" is a well-established and widely used term to describe the emotional

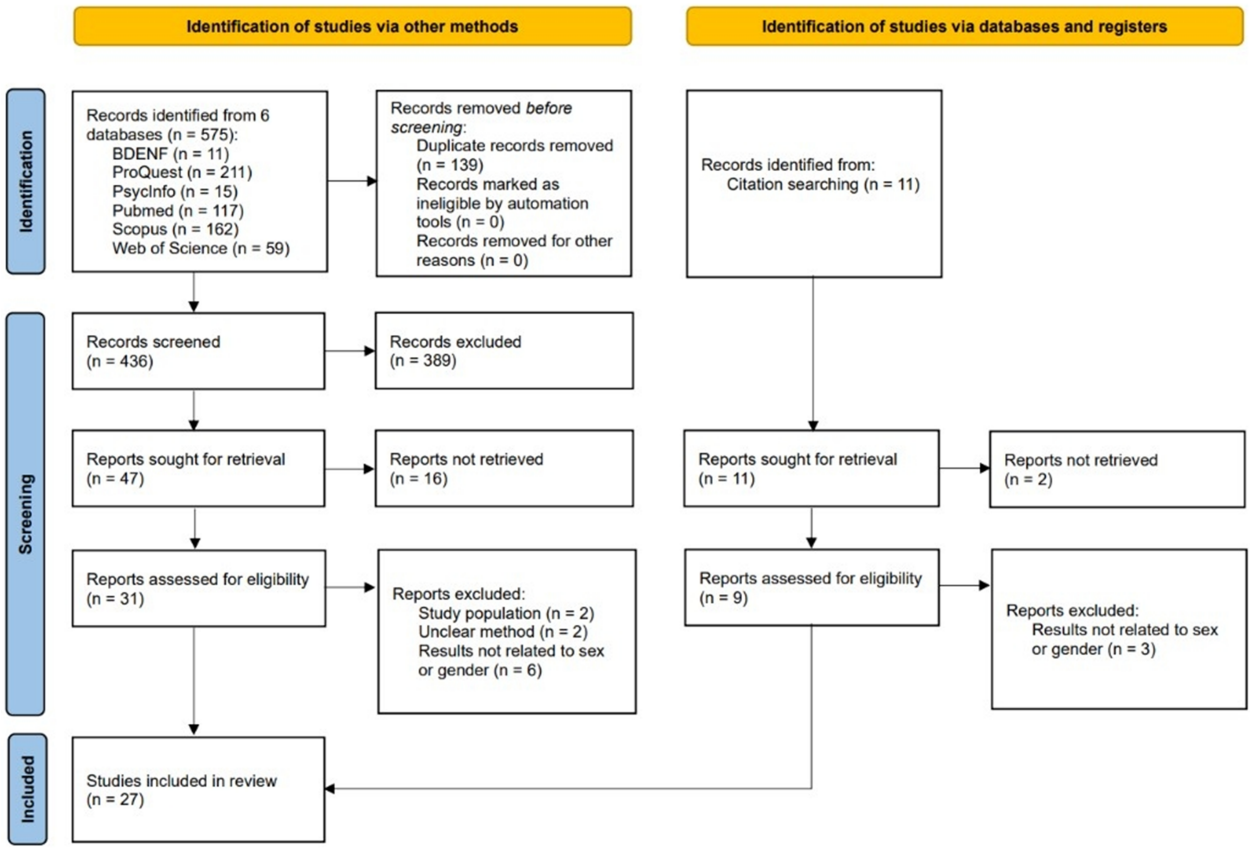

Figure 1 PRISMA flow diagram, showing that 575 records were identified from six databases: BDENF ($n = 11$), ProQuest ($n = 211$), PsycInfo ($n = 15$), Pubmed ($n = 117$), Scopus ($n = 162$), and Web of Science ($n = 59$). Before the screening phase, 139 duplicate records were removed. During the screening phase, 436 records were analyzed, and 389 were excluded. The remaining 47 records were sought for retrieval, with 16 excluded. The 31 remaining reports were assessed for eligibility, and 10 were excluded due to study population ($n = 2$), unclear method ($n = 2$), and results not related to gender ($n = 6$). Additionally, 11 records were identified from citation searching and sought for retrieval, with two not retrieved during the screening phase. Therefore, nine records were assessed for eligibility, and three were excluded due to results not related to gender. After this selection process, 27 studies were included in the review.

and behavioral reactions of healthcare professionals in the aftermath of a severe adverse event, this term was used in the search strategy along with its combination with other relevant thesauri as follows: "'second victim' AND (man OR men OR woman OR women OR male OR female OR gender OR sex)." This strategy was used in all databases, without filters or time limits, to maximize the chances of identifying relevant studies.

Selection process

After screening the titles, relevant publications were exported to Rayyan software [19] by one of the authors (V.R.N.), where two independent reviewers (V.P.J. and J.J.M.) assessed the abstracts for inclusion. Another researcher (R.S.) resolved any disagreements. All selected articles were then read in full by the other authors, and those deemed relevant by the majority of reviewers were included. The selection process is illustrated in the PRISMA flow diagram (Fig. 1).

Data collection process and data items

A data extraction form was created in Microsoft Excel, containing the variables: title, authors, journal, year of publication, country of origin, language, objectives, methods, and gender-related results and conclusions. The 27 included articles were shared between two researchers (V.R.N. and L.M.C.), who independently extracted data and completed Table 2. The complete table was reviewed by the remaining authors, who reached a consensus on its contents. Additional relevant data items were not identified during the iterative extraction process.

Synthesis methods

A descriptive quantitative analysis of the included articles was conducted, encompassing aspects such as year, country, language, design, setting, and sample (Table 1). The variables, results, and conclusions of studies that addressed the impact of the second victim phenomenon on man and women were identified and presented in Table 2. These findings were grouped based on similarity and thematic relevance, resulting in the categories: "How men and women recognize and are exposed to the second victim phenomenon," "Male/female differences in being a second victim," and "Healthcare work and experiences of men and women as second victims."

Study risk of bias assessment

JBI critical appraisal tools [20] were used by two independent reviewers (G.C.S.G. and P.B.D.) to assess the risk of bias in the included studies, considering their study designs (Tables 3

Table 1. Characteristics of the included studies ($n = 27$).

First author name, year, country, and language	Objectives	Study design	Setting	Sample	Citations (14/5/2024)
Waterman, 2007 USA and Canada English	To determine how physicians experience with medical errors and disclosure affected their job-related stress, which physicians are most affected, and how they could be better supported after errors occur.	Cross-sectional (survey study)	USA: 13 BJC HealthCare hospitals (St. Louis); University of Washington; Seattle Children's Hospital and Regional Medical Center; and Group Health Permanente (Seattle). Canada: Canadian Medical Directory	3171 (2203 male and 968 female) physicians in the USA and Canada	347
Mankaka, 2014 Switzerland English	To qualitatively explore the experience of female residents with respect to medical errors, and the coping mechanisms displayed after an error.	Qualitative study (phenomenology)	Internal Medicine Department of a University Hospital in Switzerland	Eight female residents specializing in general internal medicine	18
Dhillon, 2015 USA English	To assess the proportion of US anesthesiologists who have experienced catastrophic perioperative events and bring into focus the association between event details, respondent characteristics, and utilization of formal support with recovery time; and to ascertain the current state of post event formal support and opinions for ideal event handling across the anesthesiology practice.	Cross-sectional (survey study)	American Society of Anesthesiologists (ASA)	289 anesthesiologist members of ASA	10
McLennan 2015 Switzerland English	To examine how medical errors impact anesthesiologists in key work and life domains; anesthesiologists' attitudes regarding support after errors; and which anesthesiologists are most affected by errors.	Cross-sectional (survey study)	Five university hospitals' departments of anesthesia in Switzerland	281 (157 male and 124 female) clinically active anesthesiologists	24
Mira, 2015 Spain English	To assess the impact of adverse events in primary care and hospitals in Spain on second victims.	Cross-sectional (survey study)	Hospitals and PC health centers in health services of Andalusia, Aragón, Castilla La Mancha, Castilla y León, Cataluña, Valencia, Madrid and the Basque Country	1087 doctors and nurses (610 from PC and 477 from hospitals)	77
Van Gerver 2016 Belgium English	To examine individual, situational and organizational aspects that influence psychological impact and recovery of a patient safety incident on physicians, nurses and midwives.	Cross-sectional (survey study)	33 Belgian hospitals	913 clinicians (186 physicians, 682 nurses, 45 midwives) involved in a patient safety incident (253 men and 660 women)	70
Gupta, 2019 USA English	To characterize events contributing to the second victim effect among a diverse sample of physician mothers; to describe the impact on both provider and patient; and to determine the association between experiencing an error and burnout.	Mixed-methods study (cross-sectional survey and qualitative coding)	The Physician Moms Group (online)	5782 physician members who identify as mother	23
Johnson 2019 USA English	To determine the willingness of medical physicists to access social support in times of stress, including medical error, as a first step toward understanding and addressing workplace-associated stress.	Cross-sectional (survey study)	American Association of Physicists in Medicine (AAPM)	1001 (307 female and 687 male) medical physicists, members of the Professional Council of AAPM	10
Lu, 2019 USA English	To examine drivers behind burnout and career dissatisfaction in female and junior surgical faculty, with specific attention given to gender based differences.	Qualitative study (ground theory)	An academic surgery center	19 female and 9 male full-time faculty members in surgery who had been in practice at least 1 year	48

(continued)

Table 1. (Continued)

First author name, year, country, and language	Objectives	Study design	Setting	Sample	Citations (14/5/2024)
Shaw, 2019 Sri Lanka English	To analyze medical students' narratives of professionalism dilemmas and to explore their experiences of gender bias in hospital settings.	Qualitative study (social constructionism)	An anonymous medical school in Sri Lanka	72 students (32 men and 40 women) who participated in 12 group interviews	10
Humayun, 2020 Pakistan English	To determine the frequency of medical errors made by doctors and the prevalence of second victim phenomenon in a tertiary care hospital, and to find out the effects of the error on the second victim's life.	Cross-sectional (survey study)	Tertiary care hospital of Islamabad	200 male and female doctors	1
Lai, 2020 China English	To assess the magnitude of mental health outcomes and associated factors among health care workers treating patients exposed to COVID-19 in China.	Cross-sectional (survey study)	34 Chinese hospitals (Wuhan, Hubei province outside Wuhan, or outside Hubei province)	1257 healthcare workers (physicians or nurses) stationed in these hospitals to take care for fever or COVID-19 patients	4327
Jain 2021 India English	To assess second victim syndrome prevalence and impact among the surgeons from South Asia, as well as available support systems.	Cross-sectional (survey study)	South Asia	658 surgeons, known to authors, across various specialties	4
Strametz, 2021a Germany English	To understand the second-victim phenomenon better in a sample of young ($\leq$ 35 years) German physicians.	Cross-sectional (survey study)	German Society of Internal Medicine (DGIM)	491 (361 female and 194 male) physicians, members of the DGIM	31
Strametz, 2021b Germany English	To investigate second-victim phenomena in German nurses regarding prevalence, causes, and predisposition compared to a preceding study on German physicians (Second Victims in Deutschland/SeViD-I).	Cross-sectional (survey study)	German Nurses Association (DBfK)	332 (245 female, 82 male and 5 diverse) nurse members of DBfK	23
Ben Saida, 2022 Tunisia English	To describe the profile, the types and the severity of medical errors, and to explore the psychological impact on second victims to better understand how they cope.	Cross-sectional (survey study)	Two tertiary university hospitals (Farhat Hached and Sahloul Hospitals, Sousse)	393 (148 male and 245 female) senior and junior physicians from different departments	1
Huang, 2022 China English	To investigate the experience and support of nurses as second victims in adverse events and explore factors.	Cross-sectional (survey study)	Six tertiary comprehensive hospitals in three provinces in Mainland China.	2897 (122 male and 2775 female) registered nurses who had experienced adverse events	4
Tejedor-Romero, 2022 Spain Spanish	To know the emotional overload of workers in intensive care units during SARS-CoV-2 epidemic in a tertiary hospital in the Community of Madrid.	Cross-sectional (survey study)	Tertiary hospital in the Community of Madrid	52 intensive care and reanimation unit workers (physicians, nurses, assistant nursing care technicians and orderlies)	1
Andraska, 2023 USA English	To investigate gender-based disparities in perceived competence and professionalism as documented in an institutional electronic risk management reporting system.	Qualitative study (qualitative coding)	An electronic institutional risk management database used by hospital staff to document complaints against physicians	207 anonymous entries reported to the system (31 women, 52 men and 124 unidentified)	2

(continued)

Table 1. (Continued)

First author name, year, country, and language	Objectives	Study design	Setting	Sample	Citations (14/5/2024)
Goncharuk, 2023 Croatia English	To measure the depth of the second victim problem by identifying the most vulnerable groups of medical staff in need of priority support	Cross-sectional (survey study)	Seven departments of the University Hospital Centre Zagreb: Psychiatry, Microbiology, Gynecology, Anesthesiology, Intensive Care Unit for COVID-19, Emergency Medicine, COVID-19 Unit, and Orthopaedic Surgery	93 nurses and doctors working at the clinical departments	0
Gonzáles-Gonzáles, 2023 Spain Spanish	To analyze the occupational and psychological consequences suffered by healthcare workers who are considered second victims.	Cross-sectional (survey study)	Medical and surgical units of a university hospital	Nursing (94) and medical (113) professionals working in the university hospital	0
Marung, 2023 Germany English	To identify the prevalence of the second- victim phenomenon among emergency medical services physicians in Germany.	Cross-sectional (survey study)	German Prehospital Emergency Physician Association (BAND)	401 (277 male and 124 female) emergency physicians	12
Mousa, 2023 Saudi Arabian English	To investigate the second victim phenomenon among healthcare providers, exploring its prevalence, symptoms, associated factors, and support strategies.	Cross-sectional (survey study)	Four major public hospitals: King Faisal General Hospital, Bin Jalawi Hospital, King Fahad Hofuf Hospital, and Maternity and Children's Hospital (MCH) Hospital	321 (52 male and 269 female) registered healthcare providers in the Saudi Commission for Health Specialties with more than six months of work experience in hospitals	0
Potura, 2023 Austria English	To investigate the frequency and severity of the second victim phenomenon among Austrian pediatricians.	Cross-sectional (survey study)	Austrian Association for Pediatric and Youth Medicine (ÖGKJ)	414 (124 male and 290 female) pediatricians	5
Kang, 2024 South Korea English	To predict factors affecting clinical nurses' work-life balance due to patient safety incidents.	Cross-sectional (survey study)	Acute general hospitals with a capacity of over 100 beds in South Korea	372 (14 male and 358 female) clinical nurses providing direct patient care, each with over three months of nursing service experience	0
Tang, 2024 China English	To examine the present condition of nurses' experiences and support as second victims, and to explore the factors associated with it in nursing.	Mixed-methods study (cross-sectional survey and qualitative interviews)	Seven large tertiary general hospitals, each with over 800 beds, located across Eastern, Central, and Western China	406 nurses (385 women and 21 men) who have worked for at least 1 year and have experienced patient safety events 8 female nurses were interviewed	0
Yaow, 2024 Singapore English	To investigate the prevalence and repercussions of adverse events among surgeons, the factors influencing their reactions and perceived support structures.	Cross-sectional (survey study)	Four large teaching and academic tertiary hospitals in Singapore	196 (127 male and 69 female) surgeons from several specialties	0

Table 2. Variables, results, and conclusions related to gender in the included studies ($n = 27$).

First author name and year of publication	Variables related to gender, measurement, and analysis performed	Gender-related results	Gender-related conclusions
Waterman, 2007	Factors Associated with Increased Distress Following Errors Among Physicians Involved in Either Near Misses/Minor Errors or Serious Error. [OD. 95% IC]	Female: 1.92. IC= 1.21, 3.02	Female physicians have a higher probability of reporting stress following serious errors compared to other physicians.
Mankaka, 2014	Gender-specific experiences in relation to errors [Thematic analysis]	Male residents perceived as more confident and less affected by errors. Perceptions that sexist attitudes among male supervisors can occur.	Female residents, after experiencing a medical error, report a high level of emotional distress. Additionally, gender-based discrimination may exacerbate this already difficult experience. It is suggested that there may be gender differences in the use of coping mechanisms and attitudes displayed after an error, but further research directly comparing female and male residents is necessary to explore this.
Dhillon, 2015	Time to recovery from a catastrophic perioperative event. Four units of analysis: few days or less (<24 h combined with few days), 1 week, 1 month, and 1 year or more (1 year combined with > 1 year). A shorter recovery time was considered an 'improved' recovery experience. Chi-squared test was used to identify an association between select categorical variables and response time.	Male few days: 84 (51%) 1 week: 13 (8%) 1 month: 28 (17%) ≥1 year: 39 (24%) Female ≤few days: 20 (38%) 1 week: 5 (9%) 1 month: 8 (15%) ≥ 1 year: 20 (38%)	Gender was not linked to the time it took for recovery from a catastrophic perioperative event.
McLennan, 2015	Anxiety about future errors. [OD] Confidence in ability as a doctor. [OD]	Sex univariate model: 0.513 Sex multivariate model: 0.274 Sex univariate model: 0.688 Sex multivariate model: 0.597	Women's anxiety of future errors was higher than that of men, whereas for confidence in ability as a doctor, differences between sexes were either absent (multiple regression) or present but of small magnitude (univariate and penalized regression).
Mira, 2015	Emotional responses after an adverse event. [Student's t-tests $P < .05$]	Female doctors reported more intense emotional responses compared to male doctors: guilt (t-test 3.0, $P = .003$), anxiety (t-test 2.5, p = 0.01), re-living the event (t-test 3.3, $P = .001$), tiredness (t-test 2.8, $P = .006$), insomnia (t-test 2.7, $P = .007$), persistent doubts about clinical decisions (t-test 4.3, $P < .001$) difficulties concentrating in work (t-test 3.1, $P = .002$).	After an adverse event, women's emotional responses were more negative compared to men.
Van Gerven, 2016	Individual and situational characteristics and Impact of Event Scale score. [No. Scoring EIS: 0–75. Probable post-traumatic stress disorder (PTSD): IES-R > 19)	Male: 253. 15.34 Female: 660. 18.63	Psychological impact is higher when the degree of harm for the patient is more severe, when healthcare professionals feel responsible for the incident and among female healthcare professionals.

(continued)

Table 2. (Continued)

First author name and year of publication	Variables related to gender, measurement, and analysis performed	Gender-related results	Gender-related conclusions
Gupta, 2019	Association between experiencing an error and burnout among physician mothers. Survey about being involved in an error and the personal repercussions of the error (participants could provide more than one response: shame, guilt, loss of confidence, sadness, anger, difficulty sleeping, need to take leave from work, need for counseling/mental health support, permanent reduction in clinical role, end to clinical work or other). The Mini Z Burnout Survey was used to assess burnout, and a logistic regression model was employed to estimate the relationship between burnout and error	Burnout: 1175 (53%) Adverse personal outcome: 1607 (56%)	Negative feelings, including guilt, loss of confidence, and shame, are common among physician mothers who report involvement in medical errors. However, the study does not analyze how gender and family responsibilities affect these outcomes because similar data are not available for male physician parents or non-parent physicians.
Johnson, 2019	Willingness to seek help for medical error. [OD. *P*-value]	Male (vs. Female): 0.6. $P = .003$	Male medical physicists (vs female) were unwilling to seek social support after a medical error.
Lu, 2019	Gender bias in the workplace. [Thematic analysis] Prevalence of second victim syndrome. [Thematic analysis]	Female participants consistently described gender bias as impactful in their professional lives, indicating that it negatively affects their work experience. Male participants more prominently expressed feelings of guilt and emotional conflicts associated with complications than their female counterparts.	Female participants consistently described gender-based biases as negatively impacting their work life; however, there was a higher prevalence of second victim syndrome among male participants.
Shaw, 2019	Students' narratives of gender bias against female students	Situations where female educators or consultants discriminated against female students, especially during learning activities. Female students were often placed at a disadvantage, such as being positioned at the back while male students were given priority at the front. In some cases, educators provided guidance to male students when they made errors but belittled female students, even when they answered correctly Women were the perpetrators of these abuses	The findings highlight concerns about the development of professionalism in medical students and suggest that gender bias is deeply rooted in certain medical systems. The socio-cultural values that perpetuate discrimination against women may also explain why some female perpetrators engage in such behavior, as they attempt to navigate and overcome their subordinate roles within the field of medicine.
Humayun, 2020	Prevalence of second victims [*N*. (%)]	Male: 76. (80.6%) Female: 76. (71.7%)	The application of the Chi-square test indicates that the *P*-value is .139, which is greater than the significance level of .05. Therefore, there is no statistically significant evidence to conclude that there is a significant difference in the occurrence of medical errors between male and female doctors in this tertiary care hospital.
Lai, 2020	Depression symptoms [*N* (%)] Anxiety symptoms [*N* (%)] 3. Distress symptoms [*N* (%)]	Men: 30 (10.2%) Women: 156 (16.2%) Men: 66 (22.5%) Women: 299 (31.1%) Men: 83 (28.3%) Women: 237 (37%)	Being a woman and having an intermediate professional title were associated with severe symptoms of depression, anxiety, and distress. It is recommended that special attention be paid to the mental well-being of women, nurses and frontline workers involved in the treatment of COVID-19 patients.
Jain, 2021	Second-victim syndrome	Prevalence differences among the two genders: $P > .05$	Majority respondents were man; however, prevalence of being second victim was similar among the two genders.

(continued)

Table 2. (Continued)

First author name and year of publication	Variables related to gender, measurement, and analysis performed	Gender-related results	Gender-related conclusions
Strametz, 2021a	Risk factors for being a second victim (Gender). [OD. *P*-value] Factors influencing the symptom load of second victim. [OD. *P*-value]	Female: 2.5. *P* = .00 Female: 2.0. *P* = .01	The results indicate that women are more likely to experience second victim incidents and to suffer a higher symptom burden compared to men.
Strametz, 2021b	Risks Factors for Being a Second Victim (Gender). [OD. *P*-value] Factors influencing the symptom load of second victims (Gender). [OD. *P*-value]	Male: 0.76. *P* = .39 Male: 0.83. *P* = .67	The second-victim phenomenon is highly prevalent among German nurses, yet gender was not identified as a risk factor.
Ben Saida, 2022	Association of gender and levels of harm. [*N* (%)] Score of the Impact of Event Scale-Revised (IES-R) [Scoring: 0–88. Probable post-traumatic stress disorder (PTSD): IES-R > 33.) Factor associated with PTSD among physicians involved in medical errors. [*N*. (%)]	Minor harm (*n* =139) Male: 54 (38.8%) Female: 85 (61.2%) Serious harm (*n* =114) Male: 42 (36.8%) Female: 72 (63.2%) Male: 15 (0–59) Female: 20.5 (1–69) Female: No PTSD: 118 (57.6%) Probable PTSD: 48 (76.2%)	There were no statistically significant differences in sex between serious and minor medical errors; however, female physicians reported more serious medical errors. Female respondents reported much more distress than males, with reference to the total score of the IES-R. Female sex and serious medical errors were identified as predictors of post-traumatic stress disorder.
Huang 2022	Socio-demographic characteristics and univariate analysis of the SVEST scores. (SVEST score: 29–145) [No. Mean SVEST]	Male: 122. 93.6 Female: 2775. 90.6	Male nurses significantly differed in second-victim reactions. Male nurses had higher levels of self-reported psychological distress than female nurses
Tejedor-Romero, 2022	Emotional overload in workers caring for critical COVID-19 patients. [EASE COVID-19 Scale: <10 points reflects emotional adjustment, between 10–14 points, emotional stress, from 15–25 points moderate to high emotional overload, and > 25 points reflects extreme acute stress.]	Male: 10.6 points Female: 10.03 points	There were no significant differences in the average score of the questionnaire between men and women. Both groups showed similar levels of emotional adjustment, emotional stress, and emotional overload.
Andraska, 2023	Anonymous reports about physician trainees submitted by hospital staff to an electronic institutional risk management database. Themes were determined from event indicator codes (EIC)	52 entries identified men (25%) 31 entries identified women (15%) Complaints about men were physician related (*n* = 12, 23%) Complaints about women were communication related (n = 7, 23%). Women identified by their name only (n = 8, 26% vs. n = 3, 6%; p < 0.001) Lack of professionalism was most frequently cited in entries involving women (*n* = 29, 94%)	Gender-based differences influence how hospital staff perceive the actions and attitudes of trainees. These disparities impact training methods, perceptions of clinical competence, physician burnout, and ultimately, patient outcomes.

(continued)

Table 2. (Continued)

First author name and year of publication	Variables related to gender, measurement, and analysis performed	Gender-related results	Gender-related conclusions
Goncharuk, 2023	Perception of adverse events, measured by a questionnaire and analyzed using the ANOVA method and the Pearson correlation coefficient	Greater tendency for males to withdraw from friends and social activities after adverse events compared to females: F = 0.17 Males experienced adverse events slightly more frequently than females: 37.5% Turn to someone for help Males: 0 Females: more than 10% Receive training to enhance psychological preparedness for coping with adverse events Males: 16.8% Females: 0 Agree on the necessity to receive training to enhance coping with adverse events: Males: 87.5% Females: 72.7%	Female members of the medical staff are more likely to ask for assistance from psychologists, supervisors, and colleagues rather than opting for specialized training. Male members of the medical staff are prepared to handle and address their psychological challenges independently, without seeking help from supervisors, colleagues, or specialists. Males are slightly more susceptible to experiencing such adverse events in their work compared to female medical staff. There are no significant differences in their perception of adverse events.
Gonzáles-Gonzáles, 2023	Knowledge of the concept of second victims and its meaning. Characteristics that determine the self-perception as second victims of healthcare professionals who have been involved in some adverse event, measured by a questionnaire and the "Escala Revisada de Impacto del Estresor, versión espanola ˜ Post-traumatic stress in professionals with second victim syndrome. [OD. IC95%]	Female: 28. 20.6% Male: 15. 21.1% Female: 85. 63.0% Male: 46. 64.8% Female: 2.4. IC: 1.5–4.0	There is no statistical difference between man and women regarding the knowledge of the concept of second victim and the self-perception as second victim. Women with second victim syndrome have a significantly higher incidence of post-traumatic stress than men.
Marung, 2023	Risk factors for becoming a second victim and the impact of gender on symptom load	Risk factors for becoming a second victim: $P = .75$ Impact of gender on symptom load: $P = .09$ Gender as a factor with impact on symptom load: $P = .18$	Gender was not a statistically significant risk factor for becoming a second victim, and there was no impact of gender on symptom load
Mousa, 2023	Impact of gender on the second victims' symptom load, measured by the German standardized questionnaire SeViD-I survey and a binary logistic regression model	Association between men and high symptom loads: odds ratio = 1.4, $P = .03$	Only men presented a high symptom load, and statistically significant risk factors for being second victims were exclusively observed among men.
Potura, 2023	Likelihood of becoming a second victim based on gender [*P*-value] and the correlation between gender and symptom load	Likelihood of becoming a second victim: $P = .68$ Correlation between gender and symptom load: $r = -0.04$	There was no statistically significant likelihood of becoming a second victim based on gender, nor a significant correlation between gender and symptom load in the second victim phenomenon

(continued)

Table 2. (Continued)

First author name and year of publication	Variables related to gender, measurement, and analysis performed	Gender-related results	Gender-related conclusions
Kang, 2024	Second victim experience (psychological and physical distress, and professional self-efficacy); second victim support (colleague, supervisor, institutional, and non-work-related support); and third victim experience (turnover intentions and absenteeism), measured by Second Victim Experience and Support Tool (SVEST) Work-life balance (family, leisure, growth, and general), measured by Work-life Balance Scale (WLB)	Second victim experience Gender differences: t = -2.091, $p = 0.037$ Male score: 2.9 ± 0.93 Female score: 3.34 ± 0.75 Second victim support Gender differences: $t = -0.296$, $P = .767$ Male score: 3.13 ± 0.53 Female score: 3.17 ± 0.53 Third victim experience Gender differences: t = −1.585, $P = .114$ Male score: 2.38 ± 1.02 Female score: 2.72 ± 0.79 Work-life balance Gender differences: $t = -0.53$, $P = .958$ Male score: 2.88 ± 0.26 Female score: 2.90 ± 0.70	Female second victims experience significantly more intense psychological and physical distress, as well as lower professional self-efficacy. However, there were no gender differences observed in second victim support from colleagues, supervisors, institutions, or non-work-related support systems, nor in factors such as work-life balance and experiences as third victims, including turnover intentions and absenteeism.
Tang, 2024	Psychological, physical, and practice distress, and management, colleague, and nonwork-related support, measured by Chinese version of the Second Victim Experience and Support Questionnaire (SVEST). Perceptions and needs of nurses regarding patient safety events, the psychological, physical, and professional distress experienced by nurses after such events, as well as the coping styles adopted by nurses and hospitals, were identified through interpretative phenomenological analysis of interviews conducted with female nurses.	Psychological distress Gender differences: $t = -2.113$, $P = .035$ Male score: 13.81 ± 4.09 Female score: 15.57 ± 3.71 Management support Gender differences: $t = 2.106$, $P = .036$ Male score: 16.52 ± 5.62 Female score: 13.92 ± 5.51 Colleague support Gender differences: $t = 2.033$, $P = .043$ Male score: 7.57 ± 2.69 Female score: 6.49 ± 2.35 Nonwork-related support Gender differences: t = 2.762, $p = 0.006$ Male score: 5.48 ± 2.09 Female score: 4.29 ± 1.90	In the psychological distress data, female nurses scored higher. Male nurses received less management, colleague and non-work-related support. Female nurses interviewed reported a superficial understanding of security incidents and expressed a hope that their surroundings could offer emotional support following such events. Additionally, these nurses mentioned experiencing anxiety, fear, temporary sleep disturbances, increased caution at work, professional uncertainty, concerns about their career, seeking support from colleagues, engaging in self-focused behavioral coping, and adopting a positive coping style after such incidents.

(continued)

Table 2. (Continued)

First author name and year of publication	Variables related to gender, measurement, and analysis performed	Gender-related results	Gender-related conclusions
Yaow, 2024	Adverse events reporting, emotional and psychological impact of event, physical impact of event, and perceived support systems, measured by a questionnaire and analyzed by frequencies, percentages and statistical significance.	Incidence of adverse events in the past 12 months: $P = .28$ One adverse event: 46 (34%) Two to five adverse events: 2 (2%) More than five adverse events: 30 (22%) Physical impact: $P = .46$ Headache: 25 (13%) Weight gain: 10 (5%) Weight loss: 9 (5%) Nausea: 9 (5%) Abdominal pain: 5 (3%) No physical impact: 70 (52%) Emotional impact: $P = .37$ Guilt: 104 (53%) Anxiety: 89 (45%) Sadness: 70 (52%) Embarrassment: 41 (21%) Insomnia: 41 (21%) Positive effect experienced after an adverse event: $P = 1.00$ Improved vigilance to errors: 89 (45%) Gain new insight: 54 (28%) Advocate for patient safety: 22 (11%)	There was no significant difference between male and female staff in the incidence of adverse events in the past 12 months, physical impact, emotional impact or positive effects experienced after an adverse event.

and 4). Studies that did not meet at least 60% of the criteria were considered to have a high risk of bias. Despite this risk, all records were retained in this scoping review to provide a comprehensive overview of the available research on the topic and to assess the quality of these studies. Additionally, the number of citations for each article was considered a measure of publication quality (Table 1) [21].

Results

The database search resulted in 575 records, with 139 duplicates removed. From the remaining 436 records, 389 were excluded based on their titles and abstracts. Forty-seven full-text articles were reviewed, and 21 were included in the final analysis. Six additional articles were identified through reference review, resulting in a total of 27 included articles (Fig. 1).

As shown in Table 1, six articles (22%) originated from the USA, with one also conducted in Canada, followed by China ($n = 3$, 11%), Germany ($n = 3$, 11%), Spain ($n = 3$, 11%), and Switzerland ($n = 2$, 7%). The remaining studies ($n = 10$, 37%) were from Austria, Belgium, Croatia, India, Pakistan, Saudi Arabia, Singapore, South Korea, Sri Lanka, and Tunisia. Most were written in English ($n = 25$, 93%), with only two in Spanish ($n = 2$, 7%). No studies in Portuguese or German were identified. The included studies were published between 2007 and 2024, with a peak in 2023 ($n = 6$, 22%) and a regular distribution in 2019 ($n = 4$, 14%), 2015 ($n = 3$, 11%), 2021 ($n = 3$, 11%), 2022 ($n = 3$, 11%), and 2024 ($n = 3$, 11%). The most common study design was cross-sectional ($n = 21$, 78%), with a smaller number of qualitative ($n = 4$, 14%) and mixed-methods ($n = 2$, 7%) studies. Hospitals were the most common setting ($n = 18$, 67%), followed by professional groups or associations ($n = 7$, 26%). The samples were composed mainly of physicians ($n = 20$, 74%), with notable representation from surgeons ($n = 3$, 11%), anesthesiologists ($n = 2$, 7%), and nurses ($n = 11$, 41%). Most studies ($n = 21$, 78%) demonstrated good methodological quality (Tables 3 and 4).

How men and women recognize and are exposed to the second victim phenomenon

The results showed no statistical difference between men and women in knowledge of the second-victim phenomenon, self-perception as second victims [22], or perceptions of adverse events [23]. However, in one study, female nurses reported a superficial understanding of safety incidents [24].

Regarding susceptibility to becoming a second victim, two studies [25, 26] found no gender differences, while one Arabic study reported that only male healthcare workers had statistically significant risk factors for becoming second victims [27]. German [28] and Tunisian [29] studies found that female physicians were more likely to experience the second victim phenomenon. In the USA, the prevalence was higher among male surgeons [30], while male and female doctors in India and Pakistan showed similar rates [31, 32]. German nurses were more frequently affected, although gender was not found to be a risk factor [33].

Male/female differences in being a second victim

Most studies highlighted that women are more psychologically affected by adverse events [22, 24, 28, 29, 34–39], reporting symptoms such as guilt [35, 40], loss of confidence, shame [40], emotional distress [22, 24, 29, 34, 37–39, 41], anxiety [24, 35, 38], depression [38], insomnia [24, 35], reliving the event, tiredness, persistent doubts about clinical decisions, concentration difficulties [35], and fear [24].

Three articles reported that men exhibited high symptom loads [27, 30, 42], characterized by guilt, emotional conflicts [30], and psychological distress [42]. Four studies found similar emotional impacts for men and women [25, 26, 43, 44]. In terms of physical impact, a study with Singaporean surgeons [44] revealed no significant differences between men and women. However, Kang [34] reported more intense physical distress in South Korean nurses.

While an American study found no differences in recovery time between men and women [45], many studies indicated that male healthcare professionals were less likely to seek psychosocial support after a medical error [23, 24, 46]. Male Chinese nurses received less support from management and colleagues, while male Croatian physicians preferred to handle psychological challenges independently [23, 24]. Conversely, female Chinese nurses expressed hope that their surroundings would offer emotional support following such events and mentioned seeking support from colleagues, engaging in self-focused behavioral coping [24]. Female Croatian physicians were more likely to seek assistance from psychologists, supervisors, and colleagues rather than opting for specialized training [23].

With respect to the positive effects experienced after an adverse event, no differences were found among male and female surgeons in Singapore [44], whereas female Chinese nurses were more likely to adopt a positive coping style after such events [24].

Healthcare work and experiences of men and women as second victims

Gender-based discrimination has been identified as a factor exacerbating the second victim phenomenon [41]. For instance, a Sri Lankan study with medical students found that male students were given active instruction after making errors, while female students were demeaned even when their answers were correct. Additionally, many of the reported episodes of discrimination against female students were committed by women [47].

In one American hospital's risk management system, male physicians were criticized for being "abrupt" and "mean," while female physicians were described as "inappropriate" and "condescending," indicating different patient expectations based on gender [48].

Asian studies found no gender differences in work-life balance, turnover, or absenteeism intentions after experiencing the second victim phenomenon [41]. However, women reported lower self-efficacy, increased caution, and professional uncertainty following errors [24, 34].

Discussion

Statement of principal findings

The majority of studies included in this scoping review highlighted that women are more psychologically affected by adverse events. Gender-based discrimination against women was identified in both education and practice, exacerbating the second-victim experience. Moreover, other differences persist. Male healthcare workers are more resistant to

Table 3. Quality assessment of selected cross-sectional studies ($n = 23$).

Criteria First author	1	2	3	4	5	6	7	8	Total (%)	Overall quality
Waterman, 2007	No	Yes	No	No	NA	NA	No	Yes	33,4	Low
Dhillon, 2015	Yes	Yes	Yes	Yes	NA	NA	Yes	Yes	100	High
McLennan, 2015	No	Yes	No	No	NA	NA	No	Yes	33,4	Low
Mira, 2015	Yes	Yes	Yes	No	NA	NA	Yes	Yes	83,5	High
Van Gerven, 2016	Yes	Yes	Yes	Yes	NA	NA	Yes	Yes	100	High
Gupta, 2019	No	No	No	Yes	NA	NA	Yes	Yes	50	Medium
Johnson, 2019	No	No	No	No	NA	NA	No	Yes	16,7	Low
Humayun, 2020	No	Yes	No	No	NA	NA	Yes	Yes	50	Medium
Lai, 2020	Yes	Yes	Yes	Yes	NA	NA	Yes	Yes	100	High
Jain, 2021	No	Yes	Yes	No	NA	NA	Yes	No	50	Medium
Strametz, 2021a	Yes	Yes	Yes	No	NA	NA	Yes	Yes	83,5	High
Strametz, 2021b	Yes	Yes	Yes	No	NA	NA	Yes	Yes	83,5	High
Ben Saida, 2022	Yes	Yes	Yes	Yes	NA	NA	Yes	Yes	100	High
Huang, 2022	Yes	Yes	Yes	Yes	NA	NA	Yes	Yes	100	High
Tejedor-Romero, 2022	Yes	Yes	Yes	Yes	NA	NA	Yes	Yes	100	High
Goncharuk, 2023	Yes	Yes	Yes	No	NA	NA	Yes	Yes	83,5	High
Gonzáles-Gonzáles, 2023	No	No	Yes	Yes	NA	NA	Yes	Yes	66,8	Medium
Marung, 2023	Yes	Yes	Yes	Yes	NA	NA	Yes	Yes	100	High
Mousa, 2023	Yes	Yes	Yes	No	NA	NA	Yes	Yes	83,5	High
Potura, 2023	Yes	Yes	Yes	Yes	NA	NA	Yes	Yes	100	High
Kang, 2024	Yes	Yes	Yes	Yes	NA	NA	Yes	Yes	100	High
Tang, 2024	Yes	Yes	Yes	No	NA	NA	Yes	Yes	83,5	High
Yaow, 2024	Yes	Yes	Yes	Yes	NA	NA	Yes	Yes	100	High

Criteria mentioned in this table:
1. Clear inclusion criteria
2. Detailed description of subjects and setting
3. Exposure measured in a valid and reliable way
4. Standard criteria used for measurement of the condition
5. Confounding factors identified (NA: not applicable)
6. Strategies to address confounding factors (NA: not applicable)
7. Outcomes measured in a valid and reliable way
8. Appropriate statistical analysis

Table 4. Quality assessment of selected qualitative studies (n = 4).

Criteria First author	1	2	3	4	5	6	7	8	9	10	Total (%)	Overall quality
Mankaka, 2014	Yes	Yes	Yes	Yes	No	Yes	Ok	Yes	Yes	Yes	90	High
Lu, 2019	Yes	Yes	Yes	Yes	Yes	Yes	Ok	Yes	Yes	Yes	100	High
Shaw, 2019	Yes	Yes	Yes	Yes	Yes	Yes	Ok	Yes	Yes	Yes	100	High
Andraska, 2023	Yes	Yes	Yes	Yes	Yes	Yes	Ok	Yes	Yes	Yes	100	High

Criteria mentioned in this table:
1. Congruity between philosophical perspective and methodology
2. Congruity between methodology and objectives
3. Congruity between methodology and methods used to collect data
4. Congruity between methodology and representation and analysis of data
5. Congruity between methodology and interpretation
6. Statement locating the researcher culturally or theoretically
7. Influence of the researcher on the research
8. Participants adequately represented
9. Ethical research
10. Conclusions from the data analysis

seeking support compared to their female counterparts. No male/female differences were found in the recognition and understanding of the second victim phenomenon.

Strengths and limitations

Despite a comprehensive search strategy across six major databases, some relevant studies may have been overlooked. Selection bias was minimized through independent reviewer evaluation. However, language restrictions were applied, and most of the included studies did not directly address male/female differences in experiencing the second victim phenomenon, limiting the generalizability of the findings. Additionally, the majority of studies were conducted in high-income countries, potentially reducing applicability to low- and middle-income countries.

Interpretation within the context of the wider literature

Most of the studies were conducted in the USA, where the safety culture is more developed, as well as in European countries, where concern for second victims is beginning to take root. In studies from these countries (USA, Switzerland, Spain, Belgium, and Germany), women exhibited greater emotional distress after making a mistake. However, differences emerged in countries where cultural expectations may pressure men to hide their emotions for fear of being perceived as weak (e.g. studies from India or Saudi Arabia) and in more punitive systems, such as some Asian countries, where professionals—particularly women—may face greater stigma. In these contexts, men showed higher manifestations of distress. In Sri Lanka, the same authors suggested that their results might be influenced by socio-cultural values that perpetuate discrimination against women, which could also explain the findings.

Recognizing and understanding the second-victim phenomenon is crucial for its prevention. Prevention is a primary objective of patient safety, and interventions should address both collective factors, such as workplace pressures, and individual factors, including healthcare workers' resilience and vulnerability [49]. The results indicate that women experience a greater psychological impact as second victims compared to men, influenced by structural and cultural factors that affect their professional lives. These gender differences should be considered when designing and implementing second victim support programs. Preventive actions specifically tailored for women should focus on stress reduction, problem-solving coping strategies, emotional management, guilt processing, and fostering a work environment that actively mitigates gender disparities.

Sex and gender differences in mental health are well-documented, with women showing higher rates of mood and anxiety disorders and developing schizophrenia later in life. Several factors contribute to these disparities, including biological influences (e.g. sex hormones) and environmental stressors (e.g. childhood trauma, socialization processes that reinforce discrimination patterns, and broader gender inequalities) [13, 50–53]. However, comprehensive research on the second victim phenomenon remains limited.

Many studies emphasized that women are more psychologically affected by adverse events, highlighting the importance of considering sex and gender factors in

understanding healthcare workers' experiences during crises. Structural inequalities, such as the underrepresentation of women in decision-making roles, place significant pressure on women in healthcare settings [54, 55]. These pressures can be related to the emotional burden reported by women in relation to the second-victim phenomenon.

Differences in how male and female healthcare professionals cope and seek support were also noted, corroborating a study that investigated gender differences in coping strategies and psychological adaptation during the COVID-19 pandemic in the USA. The study found that women tend to use more passive and avoidant coping strategies in response to stressful situations, whereas men are more likely to employ problem-focused strategies. These findings suggest that gender differences in coping strategies may influence psychological adaptation, with women showing greater vulnerability to anxiety symptoms due to their predominant use of emotion-focused coping strategies [53]. Additionally, male resistance to seeking help is a significant issue that could be mitigated through leadership and institutional initiatives aimed at changing this culture. Healthcare organizations should provide accessible and effective support systems that promote well-being by fostering open discussions on errors and emotional distress [56].

Social support is a key coping strategy, but gender-based expectations often influence both the likelihood of seeking help and the type of care received [57]. Men may hesitate to seek help due to social expectations, such as toxic masculinity, which discourages vulnerability and fosters fear of being perceived as "weak" or "not very manly" [58]. Increasing social support for all healthcare workers could reduce the negative impact of the second victim phenomenon [59, 60].

Gender-based discrimination against female students was identified in two articles included in this scoping review [41, 47]. Both racial and gender discrimination can significantly increase psychological distress [54]. Sexism and sexual harassment experienced during medical studies at a Swiss university were strongly associated with negative mental health outcomes, primarily affecting non-male students during their clinical rotations [61]. After experiencing discrimination, junior doctors in NHS England hospitals reported feelings of fear, lack of confidence, and a sense of being undermined. When these experiences are chronic, they can lead to mental health issues such as depression and anxiety. Multiple barriers at individual, interpersonal, organizational, and societal levels hinder efforts to challenge discrimination, further exacerbating psychological distress [62] and making healthcare workers more vulnerable to the second victim phenomenon.

The difference in criticism directed toward men and women in healthcare settings, identified in one of the selected studies [48], was also reported in another study that highlighted the severity of gender discrimination among female healthcare workers [63]. Factors such as younger age, race, marital status, occupation, greater social support needs, lower team cohesion, and childcare responsibilities were associated with increased gender discrimination. Women reported experiences of belittlement by colleagues, gendered workload distributions, unequal opportunities for career advancement, communication expectations, objectification, expectations of motherhood, and mistreatment by patients as discriminatory situations. These findings emphasize the need to prioritize gender equity programs within the health system to improve the workplace environment [55, 63], which could also help mitigate the impact of the second-victim phenomenon on female healthcare workers and enhance their ability to cope.

Regarding work-related changes after experiencing the second-victim phenomenon, a study on sickness absence rates in European countries found significant gender disparities. Women accounted for a larger proportion of absences due to factors such as the risk of poverty or social exclusion, chronic illness or health problems, and the need to maintain social protection benefits. In contrast, men consider job satisfaction and health-related benefits when deciding to avoid absenteeism, often improving their performance through physical activity [64]. This suggests that women face greater challenges in maintaining their work activities after experiencing the effects of the second-victim phenomenon. Furthermore, a study linking self-reported second-victim distress to negative worker outcomes demonstrated that, regardless of gender, organizational support is essential for improving professionals' well-being and reducing second victim-related trauma, ultimately decreasing turnover intentions and absenteeism [65].

Hypervigilance and temporary feelings of professional inadequacy were reported by nursing and medical students and residents after experiencing the second-victim phenomenon [66, 67], along with doubts about their ability to continue their studies or competence in their field. These findings align with the results of this scoping review. However, positive behavioral changes also emerged, such as seeking more advice, paying closer attention to details, and adjusting work methods, which positively affected emotions and reduced the likelihood of future errors [67]. While research on gender bias in these factors is limited, reports suggest that women exhibit certain traits after legal claims related to errors, which positively impact their professional practice and reduce the risk of future claims [68].

Another practice commonly adopted by doctors after experiencing the second-victim phenomenon is defensive medicine. This involves deviating from standard medical practice, primarily due to fear of liability claims. A doctor's stance on defensive medicine influences the extent to which they stray from evidence-based practices, potentially leading to unnecessary tests and procedures or the avoidance of high-risk patients and services [69, 70]. There is no consensus on the role of gender in adopting defensive medicine; some studies suggest that women are more likely to engage in this practice [71], while others indicate no gender influence [72].

Implications for policy, practice, and research

It is essential to review internal protocols related to performance evaluation and feedback after adverse events. Evidence suggests that feedback and criticism toward women's errors tend to be harsher and disproportionately severe compared to their male counterparts. Adjusting these protocols will help establish objective, gender-neutral criteria to ensure fair and unbiased evaluations of healthcare professionals.

Another crucial aspect is designing awareness campaigns on the second victim phenomenon, with a targeted approach to encourage psychological help-seeking among men. Research indicates that men are more reluctant to seek emotional support, which hinders their recovery and

well-being. To address this resistance, campaigns should include messages that normalize vulnerability and reinforce the importance of self-care without it being perceived as a sign of weakness.

Similarly, psychological support programs should be tailored to differences in emotional responses between men and women. While women tend to use more emotion-focused coping strategies and seek support from colleagues, men usually adopt problem-solving strategies and avoid sharing their emotions. Therefore, interventions should facilitate access to safe emotional support spaces while providing structured tools for managing errors and psychological impact.

Additionally, peer supporters should receive specific training on gender differences in coping strategies. Professionals providing support must understand the unique barriers and needs of each gender to deliver effective and personalized interventions.

Finally, leadership strategies should be established to promote equity within healthcare teams, ensuring that all healthcare professionals receive appropriate support based on their specific needs.

Implementing these measures will help strengthen the Organizational Safety Culture, fostering a more equitable and resilient work environment that is better prepared to address the challenges posed by the second-victim phenomenon in clinical practice.

Conclusions

This study identified differences between male and female healthcare workers in how the second-victim phenomenon affects their work, although this discussion remains ongoing. Effective interventions and support programs must account for these differences, creating an environment where healthcare workers feel comfortable seeking help without fear of judgment. The design of support programs should consider that men tend to be more resistant to seeking support, while women may be more vulnerable and benefit from trained peers to assist them in these situations.

Gender differences in the reactions and behavior of supervisors, colleagues, patients, and their relatives were found only in studies involving students, highlighting the need for further research focused on healthcare workers. Future studies should also explore how peer supporters can be trained to recognize gender differences and effectively fulfill their roles, including addressing stereotypes related to women who make clinical errors.

Notably, only studies regarding men and women were identified, underscoring the invisibility of other genders in research on second victims. Additionally, comparative studies on sex and gender differences in second victim experiences are lacking, revealing a gap that should be addressed in future research.

Conflict of interest

None declared.

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Data Availability

The data underlying this article are available in the article and in its online supplementary material.

Author contributions

Vanessa Ribeiro Neves (Conception of the scoping review, Search, Review, Selection, and Synthesis of included articles, Drafting of the manuscript),

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(Review, Selection and Quality assessment of included articles, Manuscript review),

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(Review, Selection and Resolution of disagreements regarding included articles, Drafting of the manuscript, Manuscript review).

Paulo Jorge Sousa (Review and selection of included articles, Drafting of the manuscript; Manuscript review), Susanna Tella (Review and selection of included articles, Drafting of the manuscript, Manuscript review), and

José Joaquín Mira (Conception of the scoping review, Review and selection of included articles, Drafting of the manuscript, Manuscript review).

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