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REVIEW ARTICLE

Patient Safety Attitude among Healthcare Workers and Its Determinants: A Systematic Review

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ABSTRAK

Anggota penjagaan kesihatan yang mempunyai sikap positif terhadap keselamatan pesakit menunjukkan budaya keselamatan yang kukuh dalam institusi mereka. Penggabungan amalan keselamatan ke dalam aliran kerja harian dapat membantu meminimumkan kesilapan perubatan, meningkatkan hasil pesakit dan memaksimumkan kecekapan sumber. Pemupukan budaya keselamatan yang kukuh adalah penting untuk memberikan penjagaan yang lebih baik Oleh itu, kajian ini bertujuan untuk menilai sikap keselamatan pesakit merentasi domain tertentu serta mengenal pasti faktor-faktor berkaitan dalam kalangan anggota penjagaan kesihatan berdasarkan dapatan daripada Soal Selidik Sikap Keselamatan (SAQ). Kami menjalankan carian elektronik menggunakan Ovid dan PubMed dengan menggunakan istilah khusus yang berkaitan dengan penilaian, persepsi keselamatan pesakit dan anggota penjagaan kesihatan. Kami memasukkan kajian yang menggunakan SAQ sebagai alat penilaian untuk mengukur budaya keselamatan pesakit di institusi penjagaan kesihatan masing-masing. Kami telah mengesahkan secara meluas bahawa kajian-kajian tersebut memenuhi kriteria inklusi dan menilai kualitinya secara kritikal. Sebanyak 15 kajian memenuhi kriteria inklusi kami. Antara enam dimensi SAQ, kepuasan kerja mempunyai sikap positif purata yang tertinggi, iaitu antara 60 hingga 81.3, manakala kerja berpasukan mempunyai skor purata terendah, iaitu antara 48.9 hingga 77.2. Skor purata untuk sikap positif terhadap persepsi pengurusan pula berada di antara 45.2-69.6. Terdapat hubungan yang signifikan antara ciri-ciri kakitangan penjagaan kesihatan (umur, jantina, jawatan, pengalaman kerja dan sejarah latihan keselamatan) dengan sikap keselamatan pesakit. Penemuan ini memberikan pandangan berharga untuk membangunkan dasar keselamatan pesakit dan memberi tumpuan kepada bidang tertentu untuk meningkatkan keselamatan pesakit serta memperbaiki hasil klinikal dalam organisasi penjagaan kesihatan. Galakkan budaya keselamatan pesakit adalah penting untuk memajukan piawaian keselamatan pesakit di peringkat global. Kerjasama antara pembuat dasar, profesional penjagaan kesihatan dan pendidik perubatan adalah penting untuk memupuk budaya keselamatan yang kukuh.

Kata kunci: *Budaya keselamatan pesakit; penilaian keselamatan pesakit; sikap keselamatan pesakit*

ABSTRACT

Healthcare providers with positive attitudes toward patient safety demonstrate a robust safety culture within their institutions. Embedding safety practices into daily workflows can help to minimise medical

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errors, enhance patient outcomes and maximise resource efficiency. Fostering a strong safety culture is vital for delivering superior care; therefore this study aimed to evaluate patient safety attitudes across specific domains and to identify associated factors among healthcare providers, based on findings from the Safety Attitudes Questionnaire (SAQ). We conducted electronic searches using Ovid and PubMed, utilising precise terms pertinent to evaluation, patient safety perceptions and healthcare professionals. We incorporated studies that utilised the SAQ as a metric to evaluate the patient safety culture inside their healthcare organisations. We thoroughly confirmed that the studies satisfied the inclusion criteria and rigorously evaluated their quality. Fifteen studies met our inclusion criteria. Among the six dimensions of SAQ, job satisfaction had the highest mean positive attitude, ranging from 60 to 81.3, while teamwork had the lowest mean score, ranging from 48.9 to 77.2. The mean score for positive attitude, which ranged from 45.2 to 69.6, pertained to the perception of management. Based on review, there was a significant relationship between the characteristics of the healthcare personnel (age, gender, job position, work experience and history of safety training) and patient safety attitude. The findings provide valuable insights for developing patient safety policies and focusing on specific areas to enhance patient safety and improve clinical outcomes in healthcare organisations. Promotion a culture of patient safety is essential for advancing global patient safety standards. Collaboration among policymakers, healthcare professionals and medical educators is crucial for fostering a strong safety culture.
Keywords: Patient safety assessment; patient safety attitude; patient safety culture

INTRODUCTION

The World Health Organisation (WHO) provides a widely recognised and utilised definition of patient safety, defining it as the lack of avoidable injury to a patient during healthcare delivery (World Health Organisation n.d.). Sutker (2008) describes patient safety as the absence of unintended injuries caused by healthcare processes. Beyond the anticipated risks related to a patient's illness, additional challenges emerge from professional, organisational, and system-level factors (Sutker 2008).

The Institute of Medicine defines patient safety as the absence of unintentional harm. Ensuring patient safety requires implementing systems and processes designed to reduce the chance of incidents and increase the possibility of detecting and addressing them upon occurrence (Institute of Medicine Committee on Quality of Health Care 2000). The Lithuanian Health Care Ministry views patient safety as encompassing healthcare structures and processes aimed at minimising adverse events caused by the healthcare system's operations (Jakusovaite et al. 2005).

According to Emanuel et al. (2008), patient safety is a specialised field within healthcare that utilises safety science methods to build a reliable healthcare delivery system. It is regarded as a characteristic of healthcare systems, designed to diminish the occurrence and consequences of bad occurrences while improving recovery initiatives (Emanuel et al. 2008). Drawing from previous literature, we can summarise patient safety as the implementation of safe, evidence-based procedures which is followed by medical personnel in a trustworthy healthcare system (such as an institution or unit) and the prevention of avoidable harm to patients during care delivery. While patient safety has been a key focus for more than ten years, it remains essential for researchers and healthcare professionals to clearly identify the definition of patient safety they adopt in their studies or clinical practice (Emanuel et al. 2008).

The Hippocratic Oath emphasises the principle of 'first, do no harm' in medical practice. However, in the 1999 Institute of Medicine (IOM) report, To Err Is Human: Building a Safer Health System, highlighted the significant harm caused by medical errors. This widely referenced report estimated that approximately 98,000 deaths occur annually due to such errors (Institute of Medicine Committee on Quality of

Health Care 2000). While healthcare facilities have traditionally implemented error-monitoring systems, these systems have primarily focused on incident reporting after errors have been detected.

By design, this was a retroactive strategy that frequently placed blame on specific people while doing nothing to examine systems, spot patterns, or offer suggestions for general enhancements. As media coverage and public knowledge of medical mistakes grew, it became evident that the existing monitoring system was insufficient. For many healthcare institutions, patient safety has since become a primary focus, leading to the introduction of various innovative initiatives to oversee safety and mitigate faults. Strategies such as the adoption of new technologies, automation, system redundancies, event simulation and enhanced staff training have all been implemented to help to reduce error rates (Institute of Medicine Committee on Quality of Health Care 2000).

Patient Safety Culture

One of the researchers' most recognised and utilised definitions of a safety culture is defined as the culmination of individual and collective beliefs, attitudes, perceptions, competencies and behavioural patterns that shape an organisation's dedication to health and safety management, as well as its methodologies and proficiencies (Nieva & Sorra 2003; Sexton et al. 2006). Safety climate represents healthcare providers' attitudes toward patient safety (Thomas et al. 2013). A meta-analysis of safety culture has been performed to provide a conceptual framework for safety culture, accompanied by a corresponding typology that delineates seven subcultures of patient safety culture: (i) leadership; (ii) teamwork; (iii) evidence-based; (iv) communication; (v) learning; (vi) just; and (vii) patient-centered (Sammer et al. 2010).

In addition, patient safety culture is not only a key area of research but also a critical concern for hospital managers, who can utilise valuable research on how to enhance particular elements of patient safety culture (such as safety climate, stress recognition, teamwork climate, etc.) within their institutions. However, there is a perception that hospitals lack a culture devoid of punitive measures, with healthcare professionals still experiencing a blame-orientated environment in their workplaces (Wang et al. 2014)

Because of overlapping and different definitions, the previous literature is often confusing. Many authors utilise the terms safety climate or safety culture in their studies on patient safety. Nonetheless, 'culture' and 'climate' are frequently used interchangeably. Several psychometric tools were created to gauge patient safety culture within organisations, and their strengths and limitations were examined (Lee et al. 2010).

Patient Safety Attitude

Examining the underlying causes of incidents reveals that a significant portion of mishaps are caused by managerial failings and human error. Therefore, merely utilising advanced management systems and technology are not enough to control these factors and create a safe and acceptable environment; rather, enhancing employees' safe behaviors, values, beliefs and views which are referred as "safety culture", is necessary to prevent accidents (Sammer et al 2010).

Attitudes are preformed responses shaped by individuals' experiences with similar situations. Put another way, attitude can sometimes be understood as a tendency to behave in a certain way, either positively (acceptance) or negatively (disagreement), towards specific people, objects and situations. Therefore, how the employees feel about many aspects of their jobs, including safety concerns, stems from their experiences both inside and outside the workplace (Modak et al. 2007). A positive attitude toward safety is considered a key component of a strong safety culture in the workplace.

Each person's views and sentiments regarding safety issues are addressed by their safety

attitude, which also symbolise their sense of personal responsibility and dedication to safety issues. It also signifies an individual's assurance in norms, policies, regulations, processes and safety precautions (Jafari et al. 2015). A positive employee safety attitude boosts safety in the workplace, enhances safe practices and diminishes workplace accidents and near-misses. An individual's safety attitude reflects their prior preparedness to react either favourably or unfavourably to the events that are happening around them while also combining safe thinking with appropriate actions (Pettker et al. 2011).
Assessing individuals' safety attitudes can help to predict whether they will engage in safe or dangerous behaviours in the future because a person's attitude determines his behaviour, and unsafe acts are often the result of negative and weak attitudes. Additionally, by implementing effective control measures, the occurrence of workplace accidents can be reduced and workplace safety can be improved (Henning et al. 2009).

By evaluating and assessing the safety attitudes of employees and implementing targeted safety training, we can effectively reduce incidents, minimise unsafe behaviours, decrease human errors and improve cost-effectiveness. Given the importance and significance of assessing safety culture and attitudes as a primary strategy for patient safety, as well as the difficulties of implementing clinical governance systems and conducting structured safety research, this study assessed safety attitudes and identified individual and organisational predictors.

Safety Attitude Questionnaire

Likert Scale were used in all existing instruments and primarily to assess individual attitudes considering 4 to 20 components of patient safety culture. The efficacy of these tools differed, although only the Safety Attitude Questionnaire (SAQ) demonstrated a correlation with patient outcomes: Positive SAQ scores correlated with a reduction in medication mistakes, decreased incidence of ventilator-associated pneumonia, reduced bloodstream infections and abbreviated lengths of stay in the critical care unit (Sexton et al. 2006).

Moreover, the validity and reliability of the SAQ have been established in the United States of America (USA) (English version) (Modak et al. 2007), United Kingdom (UK) (Sexton et al. 2006) and Norway (Norwegian version) (Henning et al. 2009). The research findings from Lebanese nurses' SAQ questionnaire provide crucial insights for policymakers to enhance patient safety, reduce incidents and promote a more cohesive safety culture (Tirgar et al. 2018). Statistics indicate that all countries have implemented numerous measures concerning patient safety.

Implementing patient safety programs present numerous problems, as safety involves cultural, behavioural, technical, clinical and psychological domains. Transforming the safety culture necessitates its recognition and comprehension. To identify the predictive elements that affect patient safety attitudes, it is crucial to assess the patient safety attitude. Most researchers attempt to understand the safety culture within their organisation by using safety attitude assessment tools in surveys (Nieva & Sorra 2003).

These instruments were utilised to evaluate the correlations between safety attitude dimensions and the determinant factors. A strong patient safety culture in healthcare institutions is evidenced by the favourable patient safety attitudes of healthcare professionals (Sexton et al. 2006). A safety-oriented culture aims at minimising errors can be systematically integrated into daily work routines. In conclusion, enhancing safety culture in healthcare facilities will diminish medical errors, yielding improved treatment outcomes for patients and conserve expenditures.

A systematic study of patient safety attitudes among healthcare practitioners would elucidate variances in strengths and areas for potential improvement, identify respondent characteristics and highlight variables contributing to a positive safety attitude. This would assist us in identifying the correlation between patient safety attitudes

and the characteristics of healthcare personnel. This systematic review aimed to discover methods for enhancing treatment quality and lowering patient safety occurrences, hence highlighting information gaps for future study.

The objective of this study was to evaluate the patient safety attitude according to its domain and the associated factors among healthcare providers based on findings of the SAQ.

MATERIALS AND METHODS

We carried out an extensive search for pertinent published articles between January 2006 and December 2023 from two major search engines, namely PubMed and Ovid. We conducted electronic searches using Ovid and PubMed as these databases comprehensively covered high-quality, peer-reviewed medical and healthcare research. These databases were chosen for their extensive indexing of patient safety literature, ensuring a robust and diverse range of studies. We utilised precise terms pertinent to evaluation, patient safety perceptions and healthcare professionals. This study did not require a review by the Research Ethics Board, as it did not involve living subjects. For the workflow of our article search, we used the PRISMA checklist. The workflow was depicted in Figure 1. The keywords that we used were "assessment" OR "evaluation" AND "patient safety attitude" OR "patient safety culture" AND "healthcare workers" OR "healthcare personnel" AND "safety attitude questionnaire.

The articles identified from two electronic databases, namely PubMed and Ovid, were then retrieved and screened for eligible criteria based on inclusion and exclusion criteria. Eligible

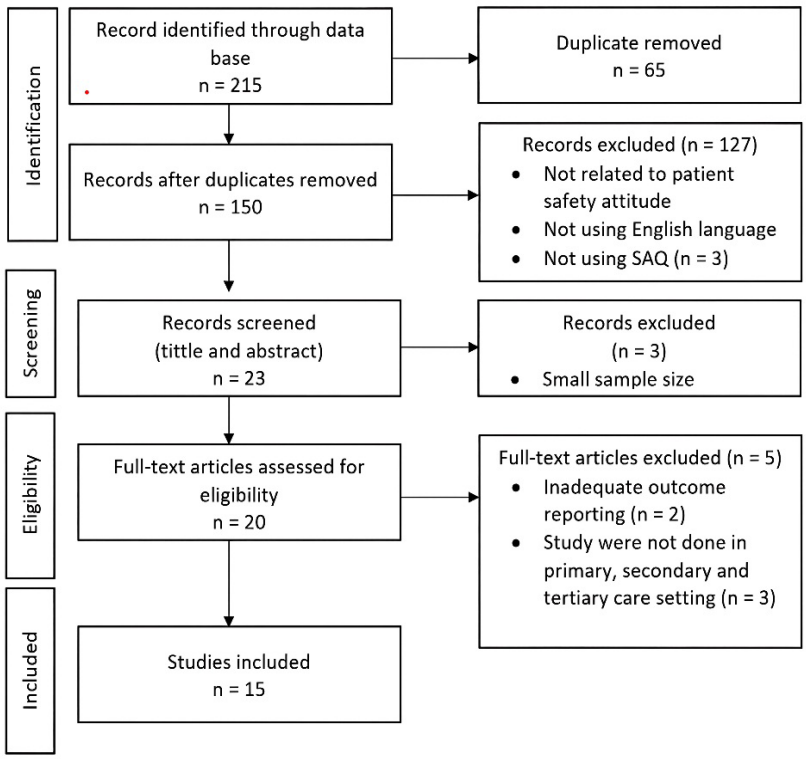

FIGURE 1: Workflow diagram (PRISMA)

articles were retrieved only if they were available as free full-text articles. The searches of the two electronic databases yielded a total of 215 articles for further review, excluding duplicates and irrelevant titles. Finally, only 15 articles were selected after screening and assessing the inclusion and exclusion criteria.

Inclusion Criteria

We incorporated papers that fulfilled the subsequent criteria: (i) utilised the SAQ as a tool for evaluating patient safety attitudes; (ii) were published in the English language; and (iii) were done in primary, secondary or tertiary care settings.

Exclusion Criteria

We excluded research according to the following criteria: (i) studies using instruments other than the SAQ to maintain methodological consistency, we included studies utilising the SAQ, ensuring comparability across findings; (ii) research that took place in residential care facilities because the focus of our study was on specific healthcare setting, such as hospitals and primary care, which differed in structure, staffing and patient interactions from residential care settings; (iii) studies that involve patients; since our research focused on specific population which was healthcare professionals, including patient studies would introduce variability in perspectives and outcomes; and (iv) studies with less than 50 participants. A minimum sample size of 50 was set to enhance the statistical power and generalisability of our findings, reducing the risk of small-sample bias. Figure 1 depicted our selecting procedure through a flow chart.

Data Extraction

We extracted data concerning the study environment, participant characteristics and quantity; composite scores for each SAQ category; and the study's provenance.

Data Synthesis

Following the screening and eligibility assessment process, a total of 15 studies were included in the final review. Data were synthesised narratively due to heterogeneity in study designs, settings, sample sizes and outcome measures.

Relevant data were extracted systematically from each included study using a predefined data extraction form. The extracted information included author(s), year of publication, study design, study setting, sample characteristics, patient safety domains assessed, instruments used (including the SAQ), key interventions, and main findings related to patient safety attitudes.

The synthesis focused on identifying recurring patterns, similarities, and differences across studies. Findings were grouped thematically according to key aspects of patient safety attitudes, including training initiatives, organisational support, safety culture practices, and outcomes related to quality of care and incident prevention. This approach allowed for a comprehensive understanding of how various interventions and contextual factors influence nurses' patient safety attitudes across different healthcare settings.

RESULTS

Fifteen articles satisfied the inclusion criteria. The country with the highest number of studies was Brazil (four studies) and the USA (three studies), while the rest were distributed as followed: Malaysia (two studies), China (two studies), Palestine (one study), Norway (one study), Denmark (one study), the UK (one study), New Zealand (one study) and Iran (one study). Of the 15 papers, 10 studies were done among hospital professionals, while two papers took place in a primary care context, one paper was in a nursing home and the other one paper was conducted in both a hospital and a primary care setting. Collectively, the studies included a total of 62,072 participants. A response rate of more than 60% was achieved in every single one of the studies that were chosen.

Type of Participants

We noted considerable diversity among the participants in the research we analysed. The majority of studies had encompassed various healthcare practitioners. Among these investigations, three papers had incorporated non-clinical personnel (e.g. administrative and managerial staff). Two studies had only surveyed nurses.

Characteristic of Participants

Based on the review, a substantial correlation existed between the attributes of healthcare staff and attitudes towards patient safety. In Tirgar et al. (2018), the odds ratio for male nurses was 40.9% lower than that of female nurses for positive attitudes towards safety ($p = 0.024$). In line with research conducted in the USA involving 187 operating room nurses, it indicated a much more favourable safety attitude among women compared to men. Bondevik et al. (2017) indicated a substantial correlation between increased age/job position and elevated scores for patient safety issues.

Other than that, safety attitude was also influenced by education level. For instance, Tirgar et al. (2018) discovered that nurses possessing educational qualifications above a bachelor's degree were 30.3 times more likely to develop a safety attitude in comparison to those with only a bachelor's degree. Furthermore, it was determined that employees' perceptions of patient safety attitudes along with their work experience were identified. Luiz et al. (2015) demonstrated in their study that professionals with 21 or more years of experience displayed higher positive judgments of safety attitudes than their less experienced peers. On working area, most selected studies indicated significant associations in the domain of unit and hospital management perception, with non-care professionals achieving higher scores than those engaged in direct care.

The study by Tirgar et al. (2018) identified that training for nurses served as a predictive factor in their safety attitudes. Specifically, nurses who did not complete personnel and patient safety courses exhibited a 49.4% lower likelihood of developing positive safety attitudes compared to their trained counterparts (Tirgar et al. 2018). A recent study by Lousada et al. (2020) found significant differences in SAQ domains based on gender, with men reporting higher scores in the areas of safety climate, stress recognition and perception of management compared to women. Home care providers rated all domains superior to primary care practitioners, with the exception of perception of stress. Furthermore, professionals with 3 to 4 years of experience assigned better scores to the domains of safety climate, job satisfaction, teamwork climate and total SAQ score ($p < 0.001$). Male workers from the home care groups possessed 3-4 years of work experience, assessing the workplace safety culture more favourably (Lousada et al. 2020).

Strengths and Area of Potential Improvement

The studies revealed significant differences among participants in their positive responses to various survey items. There was a notable consistency in studies regarding perceptions of patient safety culture. Table 1 showed six safety attitude dimensions scored by all selected studies. A study in Rio, Brazil, indicated the highest mean score for job satisfaction, while a study in Taiwan, China, reported the lowest ranking for perceived working conditions. Most studies indicated that working conditions (eight studies), stress recognition (four studies) and perception of management (three studies) were the lowest positively ranked areas, irrespective of participant type or study setting.

This composite measured the degree to which employees perceived the absence of appropriate channels for addressing patient safety issues, challenges in discussing errors and a deficient work environment culture that inhibited learning from mistakes. Additionally, working conditions were associated with recruitment and training of new employees in the workplace. Conversely, the majority of the studies (eight studies) indicated

TABLE 1: Mean score of each dimension of patient safety attitude

First Author	SAQ version	Country	Safety Attitude Dimensions (mean score)					
			Teamwork	Safety Climate	Job Satisfaction	Stress Recognition	Perception of Management	Working Conditions
Elsous et al. (2016)	SAQ Short Form Version	Palestine	72.4	69.9	73.9	70.9	68.4	58.1
Ismail & Khalid (2022)	SAQ Short Form Version	Malaysia	69.2	69.4	76.5	62.8	64.87	62.3
Rotta et al. (2022)	SAQ Short Form Version	Brazil	70.8	64.3	80.0	75.0	54.16	58.3
Lousada et al. (2020)	SAQ Short Form Version	Brazil	75.8	68.6	80.4	64.1	57.9	57.3
Bondevik et al. (2017)	SAQ - Ambulatory Version	Norway	72.5	70.8	81.3	73.9	-	69.9
Profit et al. (2012)	SAQ – ICU Version	Texas, USA	76.7	77.1	79.8	58.7	65.4	67.6
Kristensen et al. (2014)	SAQ – Danish Version	Denmark	77.2	70.3	76.2	68.1	66.8	73.8
Modak et al. (2007)	SAQ - Ambulatory Version	USA	75.3	72.3	73.9	58.5	59.7	61.4
Samsuri et al. (2015)	SAQ – Pharmacy Version	Malaysia	67.6	66.8	67.3	73.0	62.2	54.8
Luiz et al. (2015)	SAQ Short Form Version	Brazil	68.3	63.5	80.5	64.9	52.4	53.5
Sexton et al. (2006)	SAQ Short Form Version	UK NZ USA	74.3 67.9 65.7	67.7 63.8 68.8	60.7 59.9 68.6	64.2 71.7 67.2	44.6 45.3 54.1	59.6 53.7 58.3
Tirgar et al. (2018)	SAQ Short Form Version	Iran	67.99	74.6	63.5	60.2	69.06	51.8
Toso et al. (2016)	SAQ Short Form Version	Rio, Brazil	76.0	73.0	88.0	59.0	65	80.0
Lee at al. (2010)	SAQ – Chinese Version	Taiwan, China	48.9	37.2	42.1	-	45.2	31.8
Cui et al. (2017)	SAQ – Chinese Versionn	China	74.9	73.8	72.4	44.5	69.64	68.6

that job satisfaction yielded the highest mean score. Four studies indicated that teamwork had the highest mean score, while one study identified safety climate as the best mean score. In contrast, a study conducted by Sexton et al. (2006) reported the highest mean scores for teamwork in the UK, stress recognition in New Zealand, and safety climate in the USA, as the research was carried out across three different countries.

Table 2 presented a summary of key strengths and areas for potential improvement for each country, highlighting three strengths and three areas needing improvement based on their maximum and minimum rankings, respectively. As indicated in Table 2, the strength domains included teamwork, job satisfaction and safety climate. Participants who ranked this area by the high score must value good teamwork, quality of collaboration and communication, feel proud to work in the working area, and have a positive view of their job and work environment. Studies conducted in primary care settings show higher mean scores for teamwork. The highest mean score for the teamwork domain was scored in Denmark and the USA. While the highest mean score for job satisfaction was scored in Brazil and Norway.

DISCUSSION

Evidence indicates a correlation between patient safety and a developed safety culture, with enhancements in an organisation's safety culture linked to better patient outcomes (Nieva & Sorra 2003). The SAQ serves to address the increasing need for assessing safety culture within clinical settings. The UK's Joint Commission on Accreditation recommended that hospitals need to routinely perform safety culture evaluations to facilitate safety enhancements. These medical domains evaluate their climate in comparison to other units within their institutions and to their previous performance (Profit et al. 2012).

Numerous hospitals in USA employed validated questionnaires to assess safety attitudes in clinical settings and to evaluate alterations in safety attitudes subsequent to evidence-based interventions (Profit et al. 2012). Hospital safety administrators can analyse patterns in cultural modifications within certain clinical areas or the institution as a whole. Strengths and weaknesses may be assessed in the specified clinical areas, followed by the implementation of suitable interventions. A suboptimal teamwork climate indicates the need for joint rounds, whereas a deficient safety climate necessitates leadership walk rounds or a thorough safety program centered on units (Ismail & Khalid 2022; Pronovost et al. 2006; Thomas et al 2005). The SAQ factors have shown sensitivity to quality improvement interventions at Kaiser Permanente when applied in a pre- and post-intervention framework, plus new data from Johns Hopkins Medical Centre indicates that climate can be effectively intended and enhanced (Sexton et al. 2006).

Furthermore, the review indicates a significant relationship between healthcare personnel' safety behaviours - such as collaboration, safety training, reporting bad events and safety culture, which are directly tied to patient safety (Ismail & Khalid 2022). The routine safety audit in clinical units and hospitals can serve as a primary indicator, to some degree, reflecting the clinical area's safety index and the probability of safety incidents. Hospital managers must review and respond appropriately to poor items based on the communal perceptions of healthcare workers regarding their work environments (Lee et al 2010).

Variation exists among nurses, physicians and other healthcare professionals, which those exhibiting a favourable attitude more probable to engage in effective cooperation with peers. According to one study done in Ireland, perceptions of safety attitude were more positive in smaller healthcare settings amongst nurses and healthcare assistants (Gleeson et al. 2023). The primary factor affecting patient safety was identified as job satisfaction, with teamwork and safety climate following closely behind.

Job satisfaction encompasses the comprehension of work value, as well as the emotional aspects and feelings associated with

TABLE 2: Summary of the reviewed studies (Strength and area of potential improvement)

No	First Author	Country	Setting	No of participants	Type of Participants	Strength	Area of Potential Improvement
1	Elsous et al. (2016)	Palestine	4 hospitals	339	Physicians Nurses	- job satisfaction - teamwork	- working condition
2	Ismail & Khalid (2022)	Malaysia	3 hospitals	1814	Healthcare providers	- job satisfaction	- working condition - stress recognition
3	Rotta et al. (2022)	Brazil	1 hospital	434	Nurses	- job satisfaction	- perception of management - working condition
4	Lousada et al. (2020)	Brazil	6 primary healthcare 1 homecare	147	Healthcare providers	- job satisfaction	- working condition
5	Bondevik et al. (2017)	Norway	5 nursing homes	288	Clinical and non-clinical staffs	- job satisfaction	- working condition
6	Profit et al. (2012)	Texas	12 NICU	547	Clinical and non-clinical staffs	- job satisfaction	- perception of management
7	Kristensen et al. (2014) Mcguire et al. (2013)	Denmark	1 hospital	1263	Healthcare providers	- teamwork - job satisfaction	- perception of management - stress recognition
8	Modak et al. (2007)	USA	Primary care	282	Healthcare providers	- teamwork	- stress recognition
9	Samsuri et al. (2015)	Malaysia	3 hospitals 27 health clinics	117	Pharmacists	- stress recognition	- working condition
10	Luiz et al. (2015)	Brazil	1 teaching hospital	556	Healthcare providers	- job satisfaction	- perception of management
11	Sexton et al. (2006)	UK NZ USA	203 clinical areas	10843	Healthcare providers	- value teamwork - stress recognition - safety climate	- perception of management
12	Tirgar et al. (2018)	Iran	6 hospitals	295	Nurses	- safety climate	- working condition
13	Toso et al. (2016)	Rio	2 hospitals	637	Nurses	- job satisfaction	- stress recognition
14	Lee at al. (2010)	Taiwan	200 hospitals	45242	Clinical and non-clinical staffs	- teamwork	- working condition
15	Cui et al. (2017)	China	5 hospitals	1663	Healthcare providers	- teamwork	- stress recognition

the job and their influence on employee attitudes. The favourable attitude towards job satisfaction suggests that participants exhibit a reasonable level of satisfaction with their employment, which may lead to their active engagement in embracing and executing forthcoming quality enhancement projects. Job satisfaction is crucial as it enhances employee enthusiasm and stimulates both productivity and work quality (Elsous et al 2016). Dissatisfaction can divert the attention of nurses and doctors from their patients, hinder the provision of adequate care and elevate turnover rates in the sector, potentially jeopardising patient outcomes.

The significance of teamwork must not be overlooked. The atmosphere of teamwork encompasses personnel interaction and communication, reflecting the levels of trust, respect and mutual cooperation among individuals. Numerous studies have established a significant relationship between communication and collaboration within unit teams and the teamwork climate, particularly in relation to patient safety. Research indicates that enhanced teamwork can lead to significant improvements in patient outcomes and a reduction in avoidable errors (Pettker et al. 2011; Pronovost et al. 2006)

In the contemporary medical landscape, healthcare providers recognise the significance of expertise and supplementary competencies, resource allocation among team members, establishment of effective collaborative and relationships with colleagues to enhance conflict management within the team, which ultimately aim at ensuring patient safety. There is a necessity to enhance reciprocal confidence among group members and improve bidirectional communication skills within the department, particularly in the context of identifying patient care issues. Effective communication is crucial for ensuring safety, effectiveness and quality of the patient's treatment (Abdou & Saber 2011).

The dimension of 'Working Conditions' exhibited the most significant weakness in the professional evaluations. Working conditions emphasise employees' perspectives on training, essential support for accountability, and the execution of work tasks. Nurses and physicians indicate that staffing levels are inadequate to manage the patient volume and the training for new staff is insufficiently developed. This may elevate the likelihood of occurrences that could endanger patients (Cui et al. 2017).

The perception of management has been identified as a weakness in many of the selected studies. Management perception, is defined as the attitude towards hospital administration and ward support for patient safety, which represents how staff members view management's assistance in allocating sufficient resources to create secure environments. Establishing a hospital safety culture requires intricate system engineering. This culture is initiated by upper management and is reinforced through enhanced leadership roles that promote organisational awareness and behavioural changes regarding safety recognition (Pronovost et al. 2006).

Recent years have seen increased focus on patient safety within both domestic and international medical sectors. Healthcare facilities in China are dedicated to enhancing patient safety and have achieved notable progress. Many patient safety initiatives concentrate on mitigating unsafe factors related to technology and procedures. Since 2007, hospitals in China have implemented reporting channels for patient safety events as a component of their risk management systems. However, the initiative and willingness of staff to report adverse events are influenced by a culture centered on punitive measures (Cui et al. 2017).

Furthermore, a robust safety culture has not been established due to the inability to collect suitable feedback on staff performance and the lack of facilitation for open discussions regarding errors and incidents within the department. Promotional actions concerning safety culture inside businesses are either not implemented or inadequately assimilated, and the attitudes of medical staff, mentalities, competencies and behavioural patterns connected to patient safety require enhancement (Sexton et al. 2006).

In relation to the other five dimensions examined in the study, stress recognition was reported as the best score in Malaysia and New

Zealand (Samsuri et al. 2015; Sexton et al. 2006) but perceived as the lowest score in Denmark, USA and Rio, Brazil (Kristensen et al. 2015; Modak et al. 2007; Profit et al. 2012; Toso et al. 2016). Gallego et al. (2012) asserted that stress recognition is distinct from other domains of the SAQ scale, as it necessitates the assessment of an individual's conduct at work, whereas the other aspects concentrate on the behaviour of others. The stress recognition domain does not function as intended inside the SAQ, and its designation 'stress recognition' may distort the interpretation of this scale's results (Samsuri et al. 2015).

We contend that recognising stress can result in advantageous outcomes if respondents recognise the stress's influence on their performance and associate it with a desire for enhanced performance (e.g. staffs with elevated stress recognition scores emphasised the necessity for augmented staffing); conversely, it can be detrimental when they interpret it as a metric of their stress levels and link it to inadequate performance (e.g., correlating it with heightened occurrences of medication errors). For instance, an increase in stress recognition has correlated with a rise in reported medication errors, necessitating further investigation into the underlying implications of this subscale (Taylor & Pandian 2013).

Research assessing the efficacy of safety culture enhancement initiatives via the SAQ revealed notable variations pre- and post-implementation of the improvement strategy, with the exception of the Stress Recognition score (Gallego et al. 2012). The origin of stress or source of pressure, is prevalent in both China and other countries; nevertheless, more severe issue identified in China due to the significant impact of insufficient human resources on the job performance of medical staff which is exacerbated by overwork, occupational stress, weariness and other variables (Lee et al 2010). Consequently, attention must be directed towards enhancing the medical environment and the coping abilities and response intensity of medical personnel in stressful situations. Job fatigue among medical personnel is escalating, while satisfaction and loyalty are diminishing, presenting critical challenges that require attention.

Factors Associated with the Safety Attitude

While the influence of gender and age on overall patient safety attitudes remains largely unexplored, the study by Siu et al. (2003) indicated that certain senior employees exhibit more favourable attitudes towards safety than their younger counterparts.

Rigobello and colleagues (2012) assert that there is no notable disparity between men and women regarding the sense of safety climate. Conversely, Brasaite et al. (2015) demonstrated that a study involving 756 nurses across three distinct hospitals in western Lithuania indicated a substantial correlation between gender and safety attitude. This study indicated that female nurses exhibited a more optimistic attitude than their male counterparts (Brasaite et al. 2015). One factor contributing to such varied outcomes can be linked to the involvement of male and female nurses. Women are typically more attuned to safety, quality of patient care and the application of safety concepts than men (Colet et al. 2015).

An elevated level of education was identified as a significant element in enhancing nurses' safety attitudes (Tirgar et al. 2018). This importance may arise from the influence of enhanced comprehension on educational development. Indeed, an elevated level of education correlates with an enhanced comprehension of patient safety among nurses and a more favourable disposition towards it; hence, the incidence of risky practices will decrease. Individuals with better education would acquire greater understanding regarding safety issues and comprehend patient safety training more effectively. They comprehend and execute the patient safety protocols in hospitals more effectively (Brasaite et al. 2015; Deilkås & Hofoss 2008).

Conversely, there were significant discrepancies in scores among various types of providers. Only a small number of physicians held favourable evaluations of management, in sharp contrast to the proportion of managers

who viewed themselves positively. Another statistically significant conclusion indicated that nurses exhibited the greatest stress recognition scores, whereas medical assistants had the lowest. Elevated stress recognition scores signify an increased awareness of stress's impact on the provider's capacity to give safe care effectively. Despite lacking statistical significance, the highest safety attitude scores were recorded among managers and nurses. This aligns with the majority of studies indicating more favourable opinions among individuals at the upper echelons of organisational hierarchies. Although positive attitudes can benefit leaders, they may be a problem if such attitudes represent an inaccurate perspective on the profession or significantly diverge from those of others (Thomas et al. 2005).

The notable correlation between increased age and employment position and elevated ratings in patient safety aspects such as teamwork climate, safety climate, job satisfaction and working circumstances allows for several interpretations. This may be associated with a greater level of workplace connection among more seasoned and career-focused employees. In the nursing home clinical setting, elderly participants and individuals with extended work hours may experience more comfort (Bondevik et al. 2017). Conversely, younger personnel may more readily identify potential hazards or risks. They have received more current training and are presumably more familiar with the subject of patient safety than their elder counterparts. This may have heightened awareness of patient safety, as evidenced by the lower scores in this group, and may elucidate why many patient safety characteristics among younger personnel were perceived as inferior (Emanuel et al. 2008).

An essential correlation existed between job experience and the impression of patient safety attitudes. Numerous further studies involving nurses corroborate the matter, which chiefly pertains to acquiring greater work experience and fostering a strong safety culture and attitude throughout their careers (Smits et al. 2017). As job experience increases, individuals will gain greater insights into patient safety and closely monitor safety issues pertaining to patients. There is also influence of cultural and systemic differences toward patient safety attitude. According to Noort et al. (2016), national cultural tendencies for uncertainty avoidance are negatively associated with safety culture. This indicates that employee safety-related attitudes and practices may be influenced by national culture, and thus factors outside the direct control of organisational management. The study examined the relationship between safety culture and national culture, and the implications of this relationship for international safety culture assessments (Noort et al. 2016).

Most research indicates a considerable correlation between safety attitudes and hospital wards. Consequently, the likelihood of a favourable safety attitude among nurses in the emergency department was reported to be greater than that of nurses in normal hospital wards. In Egypt, no significant difference was discovered between the general score of nurses' safety attitude and all types of hospital units (Abdou & Saber 2011). Surveying the educational records of emergency department staff and implementing additional training programs, in conjunction with the specific requirements of this section, can provide a valid rationale. Another study demonstrated significant differences in patient safety attitudes among healthcare professionals based on their working units. Health care providers in psychiatric units demonstrated markedly diminished safety attitudes regarding job satisfaction, perceptions of management and working conditions compared to their counterparts in internal medicine, surgical, acute or other units (Brasaite et al. 2015).

Increase in self-reported error demonstrates that awareness of patient safety among healthcare workers is increasing. High awareness among professionals towards patient safety means they realise the importance of the events reporting system, and this reflects that they have a more positive attitude rather than those who refuse to report medical errors. It can be related to the research done by Brasaite et al. (2015), which revealed healthcare professionals who

documented a safety incident in the previous year exhibited substantially higher safety attitudes concerning their teamwork climate. Individuals without reported safety incidents in prior years exhibited more favourable attitude regarding stress recognition compared to those who had reported incidents (Brasaite et al. 2015).

Usually, safety attitude will come as a package together with safety knowledge. Healthcare providers typically gain their knowledge about patient safety by attending those trainings (safety workshops, continuous medical education and seminars). In western Lithuania, nurses who failed the patient safety training exhibited a more negative safety attitude, which elucidates the study findings (Brasaite et al. 2015). There is also influence across different healthcare systems. Universal healthcare systems can potentially exhibit distinct safety attitudes compared to private or mixed healthcare systems due to differences in staffing ratios, training practices and error-reporting policies, with variations in safety training, workload and regulatory environments significantly impact the results of any study comparing these systems (Lu et al. 2022). They also suggest that investing in patient safety culture can be regarded as the development of an organisational asset, advantageous for enhancing care quality and safeguarding staff well-being (Lu et al. 2022).

Donald (1994) indicates that safety training is a significant issue that should be incorporated into safety objectives. Another study found that attitudes were more positive following training, paralleling the improvements in knowledge reported by Brasaite et al. (2015). The study indicated that following a one-day training program on patient safety, senior physicians exhibited a significant improvement in safety attitudes, which were maintained according to their self-evaluations.

Implementing initiative programmes such as monitoring training needs and using these data to design personnel and patient safety courses has been shown to be effective. Training and workshops based on recent scientific evidence and research findings can enhance nurses' safety attitudes. These initiatives also contribute to improved quality of patient care and help prevent safety incidents within this professional group. (Arab et al. 2014; Brasaite et al. 2015).

Policy and Management Implications

Given the current findings, it is imperative to establish policies that address issues, such as enhancing working conditions, addressing perceived staff shortages, developing standards and criteria for patient safety systems and implementing interventions aim at mitigating the effects of these factors on the quality of hospital care. The disparity in safety culture perceptions across respondents may serve as guidance for management, whether at the hospital or unit level, to enhance safety culture and workforce perceptions of safety. Numerous research studies corroborate the correlation between enhancing organisational safety culture with improved patient safety and therapeutic results.

The United States Joint Commission on the Accreditation of Healthcare Organisations and The UK's National Patient Safety Association recommended frequent safety culture evaluations to enhance safety in hospitals (Pronovost et al. 2006). It emphasised the necessity of unit-based safety initiatives to enhance health care workers' sense of safety and to improve the safety climate. Examples of unit-based safety programs include the implementation of leadership work rounds, enhancement of communication, development of teamwork practices, provision of training for new personnel and ensuring proper staffing levels.

Intervention strategies grounded in leadership, teamwork and behavioural modifications have proven effective in enhancing safety and patient outcomes in industrialised nations; nevertheless, their implementation in China remains minimal (Morello et al. 2013; Nie et al. 2013). Executive Walk Rounds can include leadership in dismantling substantial obstacles to the discourse on human error in healthcare, so assisting hospitals in recognising possibilities to enhance care processes (Sexton et al. 2018). They reflect

the dedication of managers and the business to patient safety, potentially enhancing provider attitudes towards safety-related concerns (Thomas et al. 2005).

The Comprehensive Unit-based Safety Program is a comprehensive strategy encompassing safety training science, hazard identification, senior executive collaboration, defect analysis, enhanced team collaboration and interpersonal communication (Paine et al. 2010). The Triad for Optimal Patient Safety Project is anticipated to effectively improve communication and teamwork within the unit via interdisciplinary team training, the participation of a unit-based safety team to sustain safety-oriented collaboration, and the creation of a strategy for involving patients in the multidisciplinary team. The creation of a patient safety culture can be effectively integrated with targeted measures to facilitate the development of a multifaceted organisational patient safety intervention initiative (Benning et al. 2011).

CONCLUSION

A strong patient safety attitude requires targeted interventions addressing key factors such as job satisfaction, teamwork and managerial support. Healthcare organisations should implement structured safety training which is tailored to staff demographics, alongside interdisciplinary collaboration initiatives like team-based simulations and debriefings to enhance communication. Transparent feedback mechanisms can strengthen leadership support, while localised strategies, aligned with global best practices to ensure relevance across different healthcare settings. Standardised patient safety frameworks adapted to national contexts can drive consistency in improvements. Future research should assess the long-term impact of these strategies to ensure sustainable progress toward a resilient and proactive patient safety attitude.

Patient safety continues to be a global concern impacting both developed and developing nations. Healthcare organisations must prioritise the evaluation of patient safety culture, as it will yield fundamental insights into the safety-related perspectives of their personnel. Safety culture evaluation instruments can assist healthcare organisations in pinpointing areas for enhancement. It is crucial for policymakers to cultivate an equitable work environment that encourages workers to report bad occurrences, blunders, mishaps or near misses to facilitate the acquisition of lessons learned.

It is imperative that safety culture be evaluated regularly to determine the efficacy of patient safety programs and treatments. Healthcare officials, academics and policy makers must acknowledge that patient safety constitutes a significant public health issue that results in loss of life. This evaluation has determined that working conditions are perceived as a significant issue requiring enhancement, since healthcare personnel believe a 'culture of blame' persists, inhibiting incident reporting. Consequently, policymakers must assure the introduction of legislation and regulations that incentivise healthcare companies to establish patient safety reporting systems, thereby revealing potential hazards to patients and enabling healthcare organisations to derive lessons from their mistakes.

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