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Review article

# Factors influencing nursing students' perception of patient safety

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**Abstract**
*Introduction:* Patient safety is one of the main priorities of healthcare facilities worldwide. The perspective of nursing students on patient safety is essential for planning strategies to improve patient safety and its culture. Nursing students' perception of patient safety may differ between teaching and learning practices in nursing faculties, but also depends on the clinical experience gained during clinical placement.
*Objective:* To collate existing empirical research studies on factors influencing the perception of patient safety from the perspective of nursing students.
*Methods:* The search was performed in scientific databases PubMed, Scopus, and ProQuest in February 2023 and was limited to one language (English). The search produced 1,703 studies. The content analysis method was used in data synthesis.
*Results:* 36 studies were considered relevant for the review. 23 factors that affect the knowledge, skills, and attitudes of nursing students towards patient safety were determined. Four main factor groups were described as follows: Factors related to demographic data; Factors related to clinical environment; Factors related to academic environment; Contextual factors.
*Conclusion:* Nursing students' perception of patient safety was influenced by the educational and clinical environment. In relation to education, there is a need to integrate the patient safety subject at the beginning of nursing studies and to strengthen existing knowledge about adverse events.

**Keywords:** Academic environment; Clinical placement; Factors; Nursing students; Patient safety

## Introduction

Patient safety is based on preventing potential harm to the patient (WHO, 2019). The importance of creating a culture of patient safety as one of the fundamentals of sustainable patient safety has already been pointed out in a publication by the Institute of Medicine (IOM, 2000). In the last two decades, the vision that healthcare facilities have a "safety culture" that can be measured, understood, and improved has become a fundamental indicator of patient safety worldwide (Weaver et al., 2013). The culture of patient safety is defined as "the product of individual and group values, attitudes, competences, and patterns of behaviour that determine the commitment, style, and expertise of the organisation of occupational health and safety management" (IOM, 2000).

Nurses, as the largest group of healthcare professionals, spend the most time with patients. They have an irreplaceable role in building and maintaining a culture of safety (Stavrianopoulus, 2012). Based on this, they have a responsibility to provide safe nursing care to patients. To achieve adequate safety in healthcare facilities, an improvement is needed in the field of education of healthcare professionals during their studies (Alquwez et al., 2019; Colet et al., 2015). In an integrative literature review, Bedgood and Mellot (2021) further stated that the issue of patient safety should be included in the nursing curriculum, primarily with an emphasis placed on the system component, but also on the leadership of nursing students in accordance with the building of a safety culture. Colleges and universities that educate nursing students should therefore ensure that students acquire knowledge, skills, and understand the concept of patient safety as well as its culture, as this helps patients recover faster, and also leads to the prevention of adverse events (Colet et al., 2015; Mansour et al., 2018).

Nursing students form a specific group of nursing care providers in a complex health system. However, students may lack the skills and knowledge necessary to improve patient

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safety and tend to make mistakes in complex clinical settings, which may negatively impact the patient and the students themselves (Mansour, 2015). On the other hand, students can point to strengths and weaknesses in educational and clinical settings (Kong et al., 2019; Mansour, 2015). The assessment of patient safety culture by nursing students should be implemented regularly to analyse the degree of consistency between university patient safety education and clinical practice. Although nursing students are not permanent employees of the hospital, and their stay in the hospital is limited in time, their opinions on patient safety provide a realistic analysis. At the same time, they can point to shortcomings that employees have accepted over time (Kong et al., 2019). Similarly, it is very necessary to analyse particular factors that affect their assessment of patient safety. Among the main factors that influence nursing students' perception of patient safety are those related to teaching and learning about patient safety and gaining clinical experience during their clinical placement (Steven et al., 2023). Although students are only a temporary part of the nursing team, their perspective on patient safety is essential for planning strategies aimed at improving overall patient safety. Therefore, identifying factors may be beneficial for planning effective interventions to implement the topic of patient safety into education. As far as the authors are aware, factors influencing nursing students' perception of patient safety have not yet been summarized in any review study.

### *Aim*

The literature review aimed to collate existing empirical research studies on factors influencing the perception of patient safety from the perspective of nursing students.

The primary research question was stated according to SPIDER method (Sample, Phenomena of interest, Design, Evaluation, Research type) as follows: *What factors influence the nursing students' perception of patient safety?*

## Materials and methods

### *Design*

To meet the study objective, a literature review was adopted. This was carried out according to the PRISMA checklist (Preferred Reporting Items for Systematic Reviews and Meta-Analyses Checklist) (Page et al., 2021).

### *Search protocol*

The literature search included all studies published up to February 2023 in three scientific databases, specifically in PubMed, Scopus, and ProQuest. The databases were selected based on institutional availability. The search was limited to one language (English) and was carried out on the basis of the SPIDER framework (Table 1). The search was conducted using both mesh terms and different combinations of the same keywords across all searched databases. The inclusion and exclusion criteria were specified. The study was included if it: (a) was an empirical study (qualitative, quantitative, mixed-method); (b) published in a peer-reviewed journal; (c) published in the English language; (d) focused on the topic of interest (factors affecting patient safety from the perspective of nursing students). In contrast, the study was not included if it: (a) involved people other than nursing students (*e.g.*, students of midwifery or public health); (b) was a commentary, review study, validation study, case study, discussion article, or editorial.

**Table 1. SPIDER framework and search terms**

| | Inclusion criteria | Keywords |
|---|---|---|
| S (Sample) | Nursing students | (student nurse* OR nursing student*) |
| PI (Phenomena of interest) | Patient safety | (patient safety OR patient safety culture OR culture of safety OR safety climate OR patient safety climate OR safe care OR safety care OR culture of safety) |
| D (Design) | Questionnaire / Interview | unlimited |
| E (Evaluation) | Perception | (experience OR attitude* OR perception* OR opinion* OR evaluation* OR assessment* OR measure* OR measurement*) |
| R (Research type) | Qualitative / quantitative / mixed-method | unlimited |

### *Study retrieval*

According to predefined criteria, two independent researchers (DK, DB) retrieved the data within two phases of the retrieval process. The recommendations of PRISMA were reflected in the search and retrieval process (Diagram 1). For effective study retrieval, the Rayyan QCRI® program (Ouzzani et al., 2016) was used in both retrieval phases. The search produced 1,703 studies, specifically 380 from PubMed, 45 from Scopus, and 1,278 from ProQuest. The removal of duplicates ($n$ = 245) resulted in 1,458 studies that were analysed by reading titles and abstracts and examining them against the predefined criteria. In the first phase of the retrieval process, 1,415 studies were excluded, resulting in 43 studies. These studies were analysed by reading the full texts in the second phase of the retrieval process. Seven studies were excluded as they also involved students from other fields, such as midwifery, and the results were presented separately. Overall, the analysis included 36 studies.

### *Data extraction and analysis*

Two independent researchers (DK, DB) provided the data extraction. For this process, a Microsoft Excel spreadsheet was used, which included the following information: author, year, country, study aim, sample, data collection, data analysis, main findings. The content analysis with a descriptive approach followed the specific methodology of Mayring (2014), consisting of eight specific steps: formulating the research question and theoretical background; defining categories; coding; checking and reviewing codes; final coding; grouping codes; member checking; interpreting results. The comprehensiveness is the

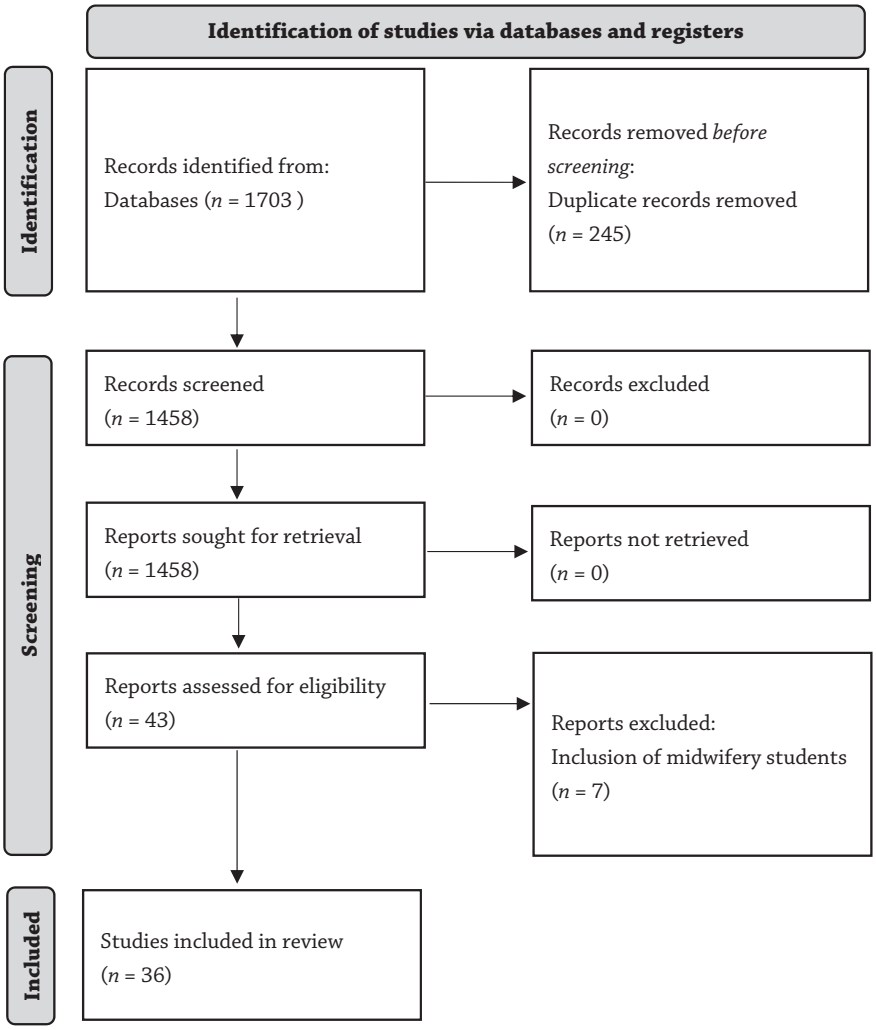


**Diagram 1.** PRISMA flow diagram

primary benefit of this methodology. Our results are presented as a narrative and in tables to meet the study objective. The research team discussed condensed and charted data in tables and double-checked precision (10% of the material). Factors influencing patient safety from the perspective of nursing students were identified from the analysed studies, specifically from the results sections.

## Results

Four groups of factors were identified in our literature review: factors related to demographic data; factors related to the clinical environment; factors related to the academic environment; contextual factors – emotional aspects, expectations, and previous experience. The description of the included studies is reported in Table 2.

### *Factors related to demographic data*

The demographic data that influenced nursing students' assessment of patient safety mainly included the year of study (*e.g.*, Alquwez et al., 2019; Dimitriadou et al., 2021), the age of nursing students (*e.g.*, Kalánková et al., 2022; Walker et al., 2019), the gender of students (*e.g.*, Colet et al., 2015; Sümen et al., 2022), and also the country or region where they came from (*e.g.*, Huang et al., 2020; Tella et al., 2015b). In addition, a Chinese study showed that students without siblings evaluated their patient safety competencies higher (Huang et al., 2020). When it comes to the year of study the results are contradictory, with a higher number of studies reporting that student self-evaluations of patient safety competencies decreased as their studies progressed (*e.g.*, Duhn et al., 2012; Lukewich et al., 2015). Other studies reported that those students with higher grades rated their knowledge, skills, or attitudes toward patient safety better (Dimitriadou et al., 2021; Stevanin et al., 2015; Usher et al., 2017). Two studies (Stevanin et al., 2015; Walker et al., 2021) reported that students in the middle of their studies evaluated patient safety worse than students of other grades. Another important factor is age: most studies show that older students generally evaluate patient safety, including selected dimensions, better (*e.g.*, Fisher and Kiernan, 2019). This however, contradicts a study conducted in Slovakia, where nursing students under the age of 25 in a practical environment better evaluated the dimension related to management support (Kalánková et al., 2022). In terms of gender, women rated their competence in patient safety or its dimensions better (*e.g.*, Çiftcioğlu et al., 2022; Sümen et al., 2022). Several studies have found statistically significant differences between individual countries/regions (*e.g.*, Dimitriadou et al., 2021; Tella et al., 2015a).

**Table 2. Description of included studies**

| Author, year, country | Study design | Sampling method | Sample size* | Data collection | Data analysis | Setting (academic/ clinical) | Identified factors |
|---|---|---|---|---|---|---|---|
| Abdelrahman and Mohamed (2017), Egypt | Descriptive, correlation study | Convenience | *N* = 200 | Hospital Survey on Patient Safety Culture | Descriptive and inferential statistics | Clinical | Year of study |
| Alquwez et al. (2019), Saudi Arabia | Descriptive, cross-sectional study | Convenience | *N* = 829 | Health Professional Education in Patient Safety Survey | Descriptive and inferential statistics | Both | Gender, regions/ nationality, faculty/ study program |
| Amilia and Nurmalia (2020), Indonesia | Descriptive study | Stratified random | *N* = 181 | Web-based Health Professional Education in Patient Safety Survey | Descriptive and inferential statistics | Both | Year of study, faculty/ study program |
| Amsrud et al. (2015), Norway | Cross-sectional study | Purposive | *N* = 66 | Manchester Clinical Supervision Scale, Effects of Supervision Scale | Descriptive and inferential statistics | Clinical | Supervision |
| Bressan et al. (2021), Italy | Longitudinal study | Purposive | *N* = 90 | Health Professional Education in Patient Safety Survey | Descriptive and inferential statistics | Both | Year of study |
| Chenot and Daniel (2010), USA | Exploratory quantitative study | Snowball | *N* = 318 | Healthcare Professionals Patient Safety Assessment | Descriptive and inferential statistics | Academic | Age, gender |
| Colet et al. (2015), Saudi Arabia | Cross-sectional study | Convenience | *N* = 191 | Health Professional Education in Patient Safety Survey | Descriptive and inferential statistics | Both | Gender |
| Çiftcioğlu et al. (2022), Turkey | Descriptive, cross-sectional study | Not reported | *N* = 966 | Patient Safety Culture Scale | Descriptive and inferential statistics | Clinical | Gender, optional choice of profession |
| Dimitriadou et al. (2021), Cyprus and Greece | Descriptive comparative study | Purposive | *N* = 486 | Health Professional Education in Patient Safety Survey | Descriptive and inferential statistics | Both | Year of study, regions/ nationality |
| Duhn et al. (2012), Canada | Cross-sectional study | Purposive | *N* = 238 | Health Professional Education in Patient Safety Survey | Descriptive and inferential statistics | Both | Year of study |
| De Oliveira and da Silva (2022), Brazil | Descriptive qualitative study | Not reported | *N* = 12 | Semi-structured interviews | Content analysis | Both | Teamwork and communication, teaching about patient safety |
| Fagan et al. (2021), Australia | Qualitative study | Purposive | *N* = 53 | Semi-structured interview | Interpretive description | Clinical | Personal goals |
| Farokhzadian et al. (2022), Iran | Descriptive comparative study | Census | *N* = 377 | Health Professional Education in Patient Safety Survey | Descriptive and inferential statistics | Both | Gender, adverse events, teaching about patient safety |
| Firat Kılıç and Cevheroğlu (2023), Cyprus | Descriptive study | Convenience | *N* = 191 | Patient safety competency self-evaluation tool | Descriptive and inferential statistics | Both | Age, year of study, adverse events, perceived previous knowledge about patient safety |
| Fisher and Kiernan (2019), UK | Interpretative phenomeno-logical study | Purposive | *N* = 12 | Semi-structured interviews | Hermeneutic phenomenology | Clinical | Age, supervision, stigmatization, teamwork, and communication, |
| Huang et al. (2020), China | Multi-site, cross-sectional study | Convenience | *N* = 732 | Web-based Health Professional Education in Patient Safety Survey | Descriptive and inferential statistics | Both | Regions/nationality, only child, adverse events, perceived previous knowledge about patient safety, self-assessment of competencies, self-study |

**Table 2.** ***(continued)***

| Author, year, country | Study design | Sampling method | Sample size* | Data collection | Data analysis | Setting (academic/ clinical) | Identified factors |
|---|---|---|---|---|---|---|---|
| Kalánková et al. (2022), Slovakia | Cross-sectional study | Purposive | *N* = 66 | Web-based Hospital Survey on Patient Safety Culture for Nursing Students | Descriptive and inferential statistics | Clinical | Age, supervision, adverse events, current placement, perceived previous knowledge about patient safety |
| Kong et al. (2019), China | Cross-sectional study | Convenience | *N* = 231 | Safety Attitude Questionnaire | Descriptive and inferential statistics | Clinical | Age, behavior related to safety, previous experience with nursing care provision, teaching about patient safety |
| Langari et al. (2017), UK and Finland | Descriptive, correlation, cross-sectional study | Purposive | *N* = 353 | Patient Safety in Nursing Education Questionnaire | Descriptive and inferential statistics | Both | Regions/nationality, teaching about patient safety |
| Lee and Dahinten (2023), USA | Cross-sectional study | Convenience | *N* = 249 | Patient Safety Competency Self-Evaluation Tool for Nursing Students, Cultural Competence Assessment Instrument | Descriptive and inferential statistics | Both | Teaching about patient safety |
| Lukewich et al. (2015), Canada | Cross-sectional study | Convenience | *N* = 716 | Health Professional Education in Patient Safety Survey | Descriptive and inferential statistics | Both | Year of study |
| Lundell Rudberg et al. (2022), Sweden | Longitudinal study | Purposive | *N* = 34 | Semi-structured interviews | Qualitative content analysis | Academic | Personal goals |
| Ortiz de Elguea et al. (2019), Spain | Validation study | Purposive | *N* = 654 | Hospital Survey on Patient Safety Culture for nursing students | Descriptive and inferential statistics | Clinical | Year of study |
| Ryan et al. (2021), Australia | Qualitative study | Purposive | *N* = 18 | Semi-structured interviews | Thematic analysis | Clinical | Rounding |
| Stevanin et al. (2015), Italy | Cross-sectional study | Convenience | *N* = 573 | Health Professional Education in Patient Safety Survey, two open-ended questions about any adverse event(s) | Descriptive and inferential statistics, content analysis | Both | Year of study, adverse events |
| Steven et al. (2014), UK | Multi-method study | Purposive | *N* = 24 | Focus groups, practice placement observation, interviews | Analytic framework, coding | Both | Supervision, adverse events |
| Suliman (2019), Jordan | Descriptive, cross-sectional study | Not reported | *N* = 297 | Health Professional Education in Patient Safety Survey | Descriptive and inferential statistics | Both | Year of study, perceived previous knowledge about patient safety |
| Sullivan et al. (2009), USA | Descriptive study | Not reported | *N* = 565 | QSEN Student Evaluation Survey | Descriptive and inferential statistics | Both | Previous experience with nursing care provision, form of study |
| Sümen et al. (2022), Turkey | Cross-sectional study | Convenience | *N* = 204 | Health Professional Education in Patient Safety Survey | Descriptive and inferential statistics | Both | Gender, adverse events |
| Tella et al. (2015a), UK and Finland | Cross-sectional study | Purposive | *N* = 353 | Patient Safety in Nursing Education Questionnaire | Descriptive and inferential statistics | Academic | Regions/nationality |
| Tella et al. (2015b), UK and Finland | Cross-sectional study | Purposive | *N* = 353 | Patient Safety in Nursing Education Questionnaire | Descriptive and inferential statistics | Academic | Regions/nationality |
| Torkaman et al. (2022), Iran | Quasi-experimental study | Census | *N* = 50 | Health Professional Education in Patient Safety Survey | Descriptive and inferential statistics | Both | Teaching about patient safety |

**Table 2.** ***(continued)***

| Author, year, country | Study design | Sampling method | Sample size* | Data collection | Data analysis | Setting (academic/ clinical) | Identified factors |
|---|---|---|---|---|---|---|---|
| Usher et al. (2017), Australia | Cross-sectional study | Purposive | *N* = 1319 | Health Professional Education in Patient Safety Survey | Descriptive and inferential statistics | Both | Year of study |
| VanDen-Kerkhof et al. (2017), Canada | Mixed-method study | Purposive | *N* = 1104 | Web-based Health Professional Education in Patient Safety Survey, interviews | Descriptive and inferential statistics | Both | Internships |
| Walker et al. (2019), USA | Validation study | Convenience | *N* = 138 | Just Culture Assessment Tool | Descriptive and inferential statistics | Academic | Age |
| Walker et al. (2021), USA | Validation study | Not reported | *N* = 800 | Just Culture Assessment Tool | Descriptive and inferential statistics | Academic | Year of study |

*Note:* * Nursing students

***Factors related to the clinical environment***

From the point of view of nursing students' clinical practice, a wide range of factors have been identified that can significantly affect the assessment of nursing students' knowledge, skills, or attitudes regarding patient safety. The most problematic factor was the reporting of adverse events. Students who had experience with adverse events (or their reporting) evaluated their knowledge, skills and/or attitudes towards patient safety significantly better (*e.g.*, Firat Firat Kılıç and Cevheroğlu, 2023; Sümen et al., 2022). Supervision during clinical placement of students (*e.g.*, Kalánková et al., 2022; Steven et al., 2014), team culture, and communication within the unit (de Oliveira and da Silva, 2022; Fisher and Kiernan, 2019) as well as previous experience with the provision of nursing care (Kong et al., 2019; Sullivan et al., 2009) significantly affected perception of patient safety among nursing students. In qualitative studies, the knowledge, skills, or attitudes of nursing students towards patient safety were significantly affected by regular patient visits (Ryan et al., 2021), but also by the labelling of students as troublemakers (Fisher and Kiernan, 2019). The quantitative study revealed that the current clinical placement can also affect the perception of patient safety, with students from intensive care units and primary care settings evaluating selected dimensions of patient safety better (Kalánková et al., 2022). Behaviour related to patient safety, as well as lower student workload, also had an impact on the perception of patient safety (Kong et al., 2019).

***Factors related to the academic environment***

Among the factors related to the academic environment, teaching on patient safety implemented at the faculties dominated. Students who completed this training on patient safety within the academic environment evaluated their knowledge, skills, and/or attitudes significantly better (*e.g.*, Lee and Dahinten, 2023; Torkaman et al., 2022). Another influential factor was the differences in evaluation between individual faculties in Saudi Arabia (Alquwez et al., 2019) and the study programmes in Indonesia (Amilia and Nurmalia, 2020). International nursing students reported a higher level of confidence in their knowledge of patient safety (VanDenKerhof et al., 2017), and students in higher education programmes (*e.g.*, postgraduate) rated their patient safety competencies better than undergraduate students (Sullivan et al., 2009).

***Contextual factors – emotional aspects, expectations, and previous experience***

Among these factors, the influence on the evaluation of knowledge, skills, and attitudes related to patient safety was primarily identified in terms of perceived prior knowledge of patient safety. Students who perceived their knowledge of patient safety as high (*e.g.*, Huang et al., 2020; Suliman, 2019) rated their patient safety competencies significantly better. At the same time, students who indicated a higher overall degree of patient safety in the clinical environment rated some dimensions of patient safety culture significantly better (Kalánková et al., 2022). Among the personality or contextual factors, a higher level of self-assessment of one's own competences, self-study (Huang et al., 2020), voluntary choice of nursing studies (Çiftcioğlu et al., 2022), but also higher persistence and personal goals (Fagan et al., 2021; Lundell Rudberg et al., 2022) contributed to nursing students' higher assessment of knowledge, skills, and/or attitudes towards patient safety. Higher persistence and personal goals were factors identified in qualitative studies. In the study by Fagan et al. (2021), students reported that they were afraid to talk about patient safety in a clinical setting and needed more time to decide whether to talk about patient safety issues or not. The second study (Lundell Rudberg et al., 2022) described how it is necessary to set personal goals to be able to proceed in accordance with safe practices and not always follow mentors who sometimes do not follow safe practices.

## Discussion

The perspective of nursing students on patient safety is crucial as they actively participate in the provision of nursing care during their clinical placements and are thus able to identify the strengths and weaknesses of the provision of care. They should have the knowledge necessary to ensure patient safety. However, there needs to be more evidence on how students learn patient safety principles during their studies (Bressan et al., 2021). Therefore, our study aimed to collate existing empirical research studies on factors affecting the perception of patient safety from the perspective of nursing students. Based on the results of the literature review, four groups of factors

were identified that influence patient safety from the perspective of nursing students.

Nursing students are in direct contact with patients during clinical placements and can directly influence the provision of nursing care in individual workplaces. The EC/36/2005 directive applies in the European region, mandating nursing students to accumulate 4,600 hours of total teaching for professional competence, with a requirement for the practical component to constitute at least 50%. In clinical practice, students acquire the necessary competencies and relevant professional values and adopt value-orientated behaviour based on the environment norms and safety culture. However, they may need more skills and knowledge to improve patient safety and tend to make mistakes in complex clinical settings, which can negatively impact the patient and the students themselves (Mansour, 2015). On the other hand, nursing students can reveal different perspectives on patient safety culture because they are members of healthcare teams (even if only during clinical placement). Their attitudes towards safety culture can point to areas of strength and weakness in educational and clinical settings (Kong et al., 2019).

Of the demographic data factors, the most significant was the year of study, with more studies showing that nursing students' perception of patient safety declined in higher years (*e.g.*, Duhn et al., 2012, Lukewich et al., 2015). Of the factors related to clinical environment, adverse events were the most prevalent, with students who experienced adverse events rating the patient safety issues significantly higher (*e.g.*, Farokhzadian et al., 2022 Stevanin et al., 2015; Steven et al., 2014). In the academic environment, a significant impact has been identified in the area of patient safety teaching (*e.g.*, Kong et al., 2019; Lee and Dahinten, 2022; Torkaman et al., 2022). In the case of contextual factors, it has also been highlighted that when nursing students perceived their prior knowledge of patient safety as high, they also stated their own perception as significantly higher (*e.g.*, Huang et al., 2020; Kalánková et al., 2022).

The quality and safety of nursing student care is greatly influenced by the academic environment, which was also identified as one of the factors. Key factors in increasing patient safety are the level of knowledge and skills of nurses in clinical practice (Alfredsdottirand and Bjornsdottir, 2008). Regarding the factors identified in our literature study, age, study year, or previous nursing care experience significantly influence the perception of patient safety. Given that they have experience with practical training and various complex clinical situations, senior nursing students should better understand the complexity of patient safety issues. Based on the experience gained during clinical placement, independence and confidence in patient care (including patient safety skills) can be noted in these students. Despite this, nurses with knowledge and skills in patient safety are absent in clinical practice. This is probably because patient safety has not been integrated into nursing education as an explicit curriculum topic (Vaismoradi et al., 2014). Nurse managers, together with nurse educators, are responsible for ensuring that nursing students are prepared to provide quality and safe patient care (Sherwood and Drenkard, 2007). Educational institutions are designed to help nursing students reflect on their knowledge and competence in patient safety and prepare them to provide quality and safe care in various clinical settings. The first step to achieving this goal is to assess the strengths and weaknesses of patient safety competencies in nursing students. These competencies include six main ones: contributing to a culture of patient safety; working in teams; effective communication; managing safety risks; optimising human and environmental factors; and recognising and responding to adverse events (Huang et al., 2020). Other factors influencing the perception of patient safety from the perspective of nursing students are clinical environment factors (including teamwork). Through effective teamwork, it is possible to reduce the number of avoidable errors and improve the condition of patients, their outcomes, and their satisfaction with nursing care (Kalisch et al., 2010). To achieve effective interaction in a team, students must acquire appropriate knowledge, skills, and professional attitudes, including understanding of tasks, individual responsibility of team members for results, and the ability to communicate clearly and effectively (Baker et al., 2010). Additionally, authors reveal attitudes that can influence student safety behaviours. After entering practice, students must be able to act as multidisciplinary team members in an environment of many dynamic interactions (Morphet et al., 2014). The education of nursing students should include specific areas of patient safety and a subsequent regular assessment of the knowledge, skills, and specific competencies that students have acquired in relation to patient safety (Okuyama et al., 2011). Education focuses on practice that aims to protect, maintain, and promote safe care by establishing and maintaining the highest standards of safety (Butterworth et al., 2011; Stievano et al., 2009). In this context, the importance of managing and supervising nursing practise comes to the fore. In clinical practice, mentors are role models and teachers for students in providing high-quality and individualised nursing care with an emphasis on patient safety. Effective communication and constant interaction between the mentor and the student on the ward are considered integral parts of the learning process in clinical practice (Tuomikoski et al., 2018). At the same time, the presence of a mentor during clinical placement and the provision of immediate feedback strengthens professional and communication skills (McIntosh et al., 2014; Tuomikoski et al., 2018).

In this context, the Covid-19 pandemic also affected nursing students. During this period, students required more psychosocial support and regular contact with a supervisor or mentor in a clinical setting. They perceived a need for more learning opportunities due to changes in placement in departments, and because their mentors were overwhelmed with issues related to Covid-19. Students reported that there was no space for communication in the clinical environment and that they did not receive enough attention. Therefore, they expressed a more substantial need for interaction with the nurse mentor and/or lecturer or educators (Ulenaers et al., 2021). The mentioned problems are related to the identified factors referring to the student's expectations and previous experiences.

The perceptions of nursing students of patient safety culture should be regularly assessed to analyse the consistency between university patient safety education and clinical practice. Given the time-limited nature of nursing students' training in the hospital, it is crucial for students to articulate their opinions, contributing to a more realistic analysis. At the same time, they can point to shortcomings that employees have accepted over time (Huang et al., 2020). Despite the increasingly intensive orientation of healthcare institutions towards patient safety, the culture of safety as a whole is not implemented in the general education of nurses (Sherwood and Drenkard, 2007). Incorporating the principles of a just culture into teaching establishes an environment characterized by trust and fairness. Students must be confident that they will be treated fairly after reporting near misses or errors related to patient safety. In the literature, students reportedly fear con-

sequences and guilt after reporting errors (Usher et al., 2017). Overall, it is necessary to identify nursing students' perceptions of patient safety and factors that may influence it, thus improving patient safety in general.

### *Study limitations*

This literature review has several limitations. The first is the inclusion of studies published exclusively in English. Additionally, the number of scientific databases used in the literature search depended on institutional accessibility; therefore, some relevant studies may have been omitted. In contrast, the selected review design enabled the collation of an extensive number of empirical studies and, at the same time, deepened our understanding of the literature. There may also be limitations within the methodology in that both qualitative and quantitative studies were included, or a combination of both, due to the different sample of respondents. The study design based on perception evaluation, which was often conducted through self-assessment, may also be considered a limitation due to potential doubts about the credibility of respondents' answers. Finally, the risk of bias due to insufficiently random sampling may also be a limitation. Despite these limitations, factors influencing nursing students' perceptions of patient safety were categorised into specific groups, and those that can be targeted for interventions related to the integration of teaching into nursing education programs were highlighted.

## Conclusion

Our literature review revealed four groups of factors influencing nursing students' perception of patient safety, specifically those related to demographic data, the clinical environment, the academic environment, and contextual aspects. By pinpointing the factors that impact nursing students' perception of patient safety, we can strategically plan interventions to ensure the delivery of quality and safe care during their undergraduate education. Based on the conducted review, it can be said that the teaching and knowledge of patient safety among nursing students contributes to their positive perception. Based on the results of many international studies, teaching is necessary, especially to the upper grades where a decrease was noted. Simultaneously, it is crucial to educate students about adverse events, as heightened awareness among them can contribute to the prevention of adverse events and overall enhancement of patient safety. Significant improvement in the competence of nursing students regarding patient safety can be anticipated through the implementation of effective interventions in nursing education.

### *Ethical aspects and conflict of interest*

The authors have no conflict of interest to declare.

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### *Author contributions*

All listed authors confirm that they participated in the development of the manuscript in the following ways: conception and design or analysis and interpretation of the data; drafting the article or revising it critically; and final approval of the version to be published.

**Faktory ovplyvňujúce vnímanie bezpečnosti pacientov študentmi ošetrovateľstva**

**Súhrn**

*Úvod:* Bezpečnosť pacienta je jednou z hlavných priorít zdravotníckych zariadení na celom svete. Pohľad študentov ošetrovateľstva na bezpečnosť pacienta je nevyhnutný pre plánovanie stratégií na zlepšenie bezpečnosti pacienta a jej kultúry. Vnímanie bezpečnosti pacienta študentmi ošetrovateľstva sa môže líšiť medzi vyučovacími a vzdelávacími postupmi na katedrách ošetrovateľstva, ale závisí aj od klinických skúseností získaných počas klinickej praxe.
*Cieľ:* Zhromaždiť a porovnať existujúce empirické výskumné štúdie o faktoroch ovplyvňujúcich vnímanie bezpečnosti pacienta z pohľadu študentov ošetrovateľstva.
*Metódy:* Vyhľadávanie bolo realizované vo vedeckých databázach PubMed, Scopus a ProQuest vo februári 2023 a bolo limitované na jeden jazyk (angličtina). Výsledkom vyhľadávania bolo 1 703 štúdií. Pri syntéze údajov bola použitá metóda obsahovej analýzy.
*Výsledky:* 36 štúdií bolo relevantných pre tento prehľad. Identifikovaných bolo 23 faktorov, ktoré ovplyvňujú vedomosti, zručnosti a postoje študentov ošetrovateľstva k bezpečnosti pacienta. Opísané boli štyri hlavné skupiny faktorov: Faktory súvisiace s demografickými údajmi; Faktory súvisiace s klinickým prostredím; Faktory súvisiace s akademickým prostredím; Kontextové faktory.
*Záver:* Vnímanie bezpečnosti pacienta študentmi ošetrovateľstva bolo ovplyvnené vzdelávacím a klinickým prostredím. Vo vzťahu k vzdelávaniu je potrebné integrovať tému bezpečnosti pacienta na začiatku štúdia v odbore ošetrovateľstvo a posilniť doterajšie poznatky o nežiaducich udalostiach.

**Kľúčové slová:** akademické prostredie; bezpečnosť pacienta; faktory; klinická prax; študenti ošetrovateľstva

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