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Surgical nurse experience with adverse events – a descriptive qualitative study

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Abstract

Aim: To explore the experience of surgical nurses with adverse events. **Design:** A descriptive qualitative study. **Methods:** Data were collected between August 2021 and February 2022 using semi-structured interviews. Participants were nurses (n = 10) working in surgical care units in a teaching hospital in the Slovak Republic. The interviews were recorded on an audio recorder and transcribed verbatim. Data were analyzed using thematic analysis. **Results:** Two main themes were identified: Adverse events in the surgical workplace and Preventive strategies aimed at reducing adverse events. Several subthemes specified themes and reflected the nurse's experience with adverse events in surgical settings. **Conclusion:** Surgical workplaces are at risk of adverse events due to the number of surgical procedures. Given that most adverse events are preventable and systemic factors are responsible for their occurrence, we recommend implementing risk management, including active identification of patients at risk, teamwork support, management of missing resources, adjustment of the environment, and creation of a positive patient safety culture.

Keywords: acute care, adverse events, nurses, qualitative research, surgical units.

Introduction

In the past two decades, patient safety has become a globally debated issue and a major challenge for all healthcare facilities. The healthcare system can be understood as a complex dynamic system which consists of several networks and components that interact with each other at different levels. Patients may be exposed to complex nonlinear interactions at different levels (government, hospital, family) when receiving healthcare, and these interactions may result in adverse consequences, such as adverse events (Lipsitz, 2012).

Adverse events are an important indicator that presupposes quality of care. At the same time, adverse events capture the level of patient safety in inpatient healthcare facilities. Every year, thousands of patients are affected by an adverse event, resulting in prolonged hospitalization for one in ten patients, 7% of whom will die from the adverse event (de Vries et al., 2008). In the United States, for example, adverse events are the third most common cause of patient mortality, with more than 250,000 patients affected by adverse events annually.

In the United Kingdom, the annual number of adverse events is around 850,000, or about 10% of hospitalizations (World Health Organization, 2019). The occurrence of adverse events depends on the level of the economy, education, and health care, but it is also influenced by the age structure of the population. In general, we can state that adverse events occur in every healthcare system and their incidence is relatively high (Liukka et al., 2020). However, the literature reports that up to 80% of all adverse events are preventable (World Health Organization, 2019), and, therefore, it is necessary to implement targeted interventions in clinical practice aimed at minimizing the occurrence of adverse events.

Nurses play a key role in ensuring patient safety. They are involved in many aspects of patient care – from fundamental care such as hygiene, feeding, or washing patients to more specific care, such as administering pharmacotherapy or caring for intravenous sites. Nurse shortage, workload, education, or experience of nurses in the profession contribute to an environment in which adverse events or near-misses can occur and affect patient outcomes (Chang et al., 2022; Pazokian & Borhani, 2017). Furthermore, as reported in several reviews of the literature, patient safety is jeopardized by the appearance of the phenomenon of missed nursing

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care (see, for example, Kalánková et al., 2020; Recio-Saucedo et al., 2018).

Unsafe care and practices have frequently been phenomena reported in the clinical setting, mainly during the waves of the Covid-19 pandemic. These incidences put patients at risk, such as the risk of falling or the risk of infection with nosocomial infections (Stayt et al., 2022). In most cases, adverse events are underreported, which may lead to pragmatic acceptance of these events among healthcare professionals. Many quantitative studies have examined adverse events in various clinical settings, including surgical settings (see, for example, Batista et al., 2019; Kang et al., 2014). The literature shows that among the most commonly reported events are those related to surgery, pharmacotherapy, and nosocomial infections (Kang et al., 2014). However, the number of qualitative studies investigating the experiences and perceptions of healthcare professionals about adverse events in surgical settings is limited worldwide and is primarily focused on perioperative settings (Labat & Sharma, 2016; Serou et al., 2021).

Slovakia's 32,000 nurses represent the largest group of healthcare professionals in the country. Considering the important role of nurses in ensuring patient safety, their perceptions and experiences of adverse events in clinical practice could facilitate the development and implementation of targeted strategies for improving patient safety (Stayt et al., 2022). Nurse experiences of adverse events could even help identify the causes of the occurrence of errors and, thus, preventive strategies that could lead to the elimination of these errors from clinical

practice. Moreover, they can likely reveal less well-known issues related to patient safety. As nurses are the largest representative group of healthcare professionals in many countries, their experiences could be very useful for hospitals for improving quality management (Ridelberg et al., 2014).

Aim

The study aimed to explore experience with of surgical nurses with adverse events.

Methods

Design

A descriptive design was adopted for this qualitative study to explore the experience of nurses with adverse events in surgical care units. The study was carried out according to the COREQ checklist.

Sample

A teaching hospital in the Žilina region was asked to participate in the study. After giving their consent, nurses were selected from the hospital using purposeful sampling. Nurses were included in the sample if they: a) had worked at the bedside in surgical care units for at least a year; b) provided care to adult patients; c) provided informed consent. Nurses were not included in the sample if they: a) worked in outpatient care; b) occupied a managerial position. The sample consisted of ten nurses working in surgical care units. Nurse experience in the profession ranged from 1 to 20 years. Sample characteristics are reported in Table 1.

Table 1 Sample characteristics

Participant	Gender	Age	Education	Specialization training	Nurse experience in total (years)
S1	female	30	Bachelor degree in nursing	no	8
S2	female	35	Bachelor degree in nursing	no	13
S3	female	32	Bachelor degree in nursing	no	10
S4	female	46	Master degree in nursing	no	20
S5	male	24	Bachelor degree in nursing	yes (IC*)	1
S6	female	38	Bachelor degree in nursing	yes (IC*)	17
S7	female	49	Master degree in nursing	yes (IC*)	20
S8	female	25	Bachelor degree in nursing	no	2
S9	female	24	Bachelor degree in nursing	no	2
S10	male	37	Master degree in nursing	yes (IC*)	10

*IC – intensive care

Data collection

Data were collected between August 2021 and February 2022. A purpose-built semi-structured interview was created based on a review of the literature on adverse events, reporting, and management from the perspective of nurses

working in surgical care units (Zegers et al., 2011). The interview included questions that reflected the following research areas: a) adverse events, factors that contribute to the occurrence of adverse events, and reporting; b) preventive strategies that aim to eliminate the occurrence of adverse events

(Table 2). Face-to-face interviews were led by an experienced researcher with a PhD degree in a surgical workplace and recorded on an audio recorder. Data were collected until saturation. The duration of the interviews ranged from 28 to 36 minutes.

Data analysis

The interviews were transcribed verbatim using the MS Word text editor. Interview transcripts were made electronically within 48 hours of their realization. Data were analyzed by two independent researchers (SB and DK). Thematic analysis was used in the data analysis (Braun & Clarke, 2022). The thematic analysis consisted of six steps: getting acquainted with the data, generating initial codes, searching for themes, revising themes, defining and naming themes, and writing a report. Triangulation

of investigators, peer debriefing, and member checking were observed to ensure rigor and credibility. To enhance the validity of the results, the peer debriefing included an expert in qualitative research (KŽ) and a member of the research team (RK) in four phases of thematic analysis (generating initial codes, reviewing themes, defining and naming themes, and writing the report). Member checking was performed to explore the credibility of the results using the method of returning transcribed verbatim transcripts to participants (Carlson, 2010). In this study, paper versions of the transcripts was used. Member checking was used in the last phase of data analysis (writing the report). The result of the thematic analysis was the development of themes and subthemes.

Table 2 Interview guide

Part	Interview plan	Main interview questions
1	Nurses' experience with the occurrence of adverse events in surgical workplaces Nurses' perception of possible factors contributing to the occurrence of adverse events Nurses' experience with the reporting of adverse events in surgical workplaces	What experience do you have with adverse events at your workplace? In what situations are adverse events anticipated at your workplace? How adverse events are reported at your workplace?
2	Nurses' perception of possible preventive strategies that aim to eliminate the occurrence of adverse events in surgical workplaces	What may prevent adverse event occurrence at your workplace? What could you do to eliminate adverse events at your workplace?
Demographic questionnaire (gender, age, education, specialization training, nurse experience in total)		

Results

Two main themes were identified, namely: *Adverse events in the surgical workplace* and *Preventive strategies aimed at reducing adverse events*. The main themes reflect the experience of nurses with adverse events in surgical care units (Figure 1).

Adverse events in surgical workplace

The first theme reflects the experience of surgical nurses with adverse events in terms of type of adverse event, factors that contribute to their occurrence, and reporting of adverse events. It is further specified through three subthemes: 1) *Types of adverse events*; 2) *Factors contributing to adverse events*; 3) *Adverse event reporting*.

1) Types of adverse events

Based on the statements of the participants, the most common adverse events that occurred in surgical care units included falls, pressure ulcers, nosocomial infections, and medication errors. Medication errors were reported as the most common. Adverse events are the result of healthcare provision and are directly

associated with patient safety. Patients with limited mobility are particularly at risk of adverse events: “Our department includes a wide range of diagnoses that affect patient mobility, leading to frequent falls in our department” (S9). In addition to adverse events, patients are also at risk of near misses associated with the administration of prescribed pharmacotherapy. Such near misses can occur with incorrect drug type administration, incorrect dosage, or administration at the wrong time or to the wrong patient. Near misses may or may not cause harm to the patient, but it is necessary to accord them the same importance as adverse events: “... for example, the wrong patient, wrong drugs ... Since we have also worked with vascular patients, it has happened to us a few times that the lower extremities were bandaged in patients with vascular diseases ...” (S7).

2) Factors contributing to adverse events

The most effective way to manage adverse events is to identify factors that can affect a patient's health and therefore compromise his/her safety. Nurses stated that systemic factors are the main causes

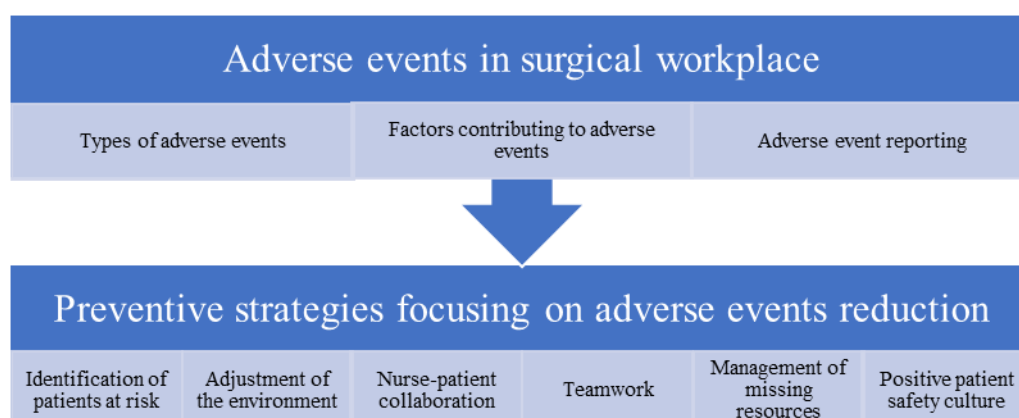


Figure 1 Themes and subthemes identified by thematic analysis

of adverse events. An inadequate working environment, a lack of staff, and also the inability to meet all the needs of all patients affect the quality of care and patient safety: *“When there is a lack of staff, it is difficult to find time to turn patients over or walk with them more often”* (S1). Most nurses attributed the occurrence of adverse events to the influence of an inadequate environment, which they described as not adapted to the patient: *“I have a problem when I go there ..., how many racks and infusions there are in that room ... there is little space”* (S1). The nurses described that the risk of adverse events also increased with the patient’s unwillingness to cooperate: *“For example, a lady was given premedication. It was explained to her that she had to stay in the bed ... but she still got out of bed and went to pray on her knees ...”* (S4). Most nurses reported that a patient’s health condition had a significant impact on their safety. If there are patients who are restless, aggressive, with cognitive deficits, or who are after major surgical procedures that require a longer recovery period, they become potentially at risk of an adverse event, and the surveillance of such patients needs to be increased.

3) Adverse event reporting

Reporting adverse events is of great importance to the mapping of patient safety culture, the development and implementation of organizational changes that reduce risk factors in the healthcare facility, and, consequently, the incidence of adverse events. According to the nurses’ statements, adverse events with a significant impact on the patient were reported, such as falls, pressure ulcers, and nosocomial infections: *“We have a book with evidence on pressure ulcers and some protocols in the case of a patient falling, but nothing more ... Nosocomial infections are reported only by*

physicians” (S5). If the patient falls during hospitalization, the nurse immediately informs the physician who examines the patient. Subsequently, a report on the occurrence of the fall is written in two copies. While one report remains in the patient’s records, the other is sent to hospital management: *“... so we write out such a form with the description of who, when, where, what happened to the patient and if there were witnesses ... and if it is found that the patient experiences pain in the body part impacted, then the patient is sent for X-ray”* (S1). The fall protocol, sometimes written manually, is approved by the hospital management and is part of the hospital information system. Similarly, nurses also report pressure ulcers describing the stage of the pressure ulcer, the location, risk factors, and the treatment method. In addition, nurses report every pressure ulcer to the nurse specialist for chronic wounds, while photo documentation is attached to evaluate and determine the appropriate treatment according to the type of pressure ulcer.

Preventive strategies aimed at reducing adverse events

The second main theme reflects preventive strategies aimed at reducing adverse events, specified by six subthemes: 1) *Identification of patients at risk*; 2) *Adjustment of the environment*; 3) *Nurse-patient collaboration*; 4) *Teamwork*; 5) *Management of missing resources*; 6) *Positive patient safety culture*.

1) Identification of patients at risk

The nurses explained that to evaluate a high-risk patient, they used medical history data with subsequent evaluation of the patient’s health status through an interview. As another way of identifying risk, nurses mentioned risk assessment based on the patient’s age and medical diagnosis, which might predispose him / her to risk, e.g., fall / decubitus. During interviews, we found that nurses did not use

specific risk assessment scales: *“In our workplace, patients are not identified as at risk because we do not use any scales or assessment tools. We pass on such information only orally after our observation ...”* (S9).

2) Adjustment of the environment

Nurses were aware that one of the critical factors that affects patient safety is architectural conditions. As a preventive strategy to minimize the risk of adverse events, nurses mentioned adapting the environment to the patient: *“We also have to adapt the room so that the patient has a clear path ... so that nothing gets in his/her way”* (S3). Nurses also stated that it was necessary to eliminate risk by securing the trapeze, side rails, or signaling equipment. As part of fall prevention, the set-up of rooms such as showers and toilets is also checked: *“As part of the equipment of our unit, both the shower and the toilet are equipped with handrails ... There are no anti-slip aids as such, but there is a chair in the shower corner so that the patient does not stand and does not slip in the shower. So, it is like some kind of fall prevention”* (S5).

3) Nurse-patient collaboration

In surgical departments, an important part of providing nursing care is patient information and education. Nurses stated that patient safety could be positively influenced by patient education: *“We must inform the patient about events before surgery so that the patient can take care of, for example, a chest drain. Then the treatment proceeds as it should”* (S3). Nurses also stated that establishing a trusting relationship with the patient is an important step in improving patient safety. They regarded non-compliance and non-adherence to regimen measures as a problem in the collaboration between the patient and the nurse: *“Because if someone is instructed about something, it is also important that he/she follows what was recommended to him/her. If there are people who do not cooperate, some things simply cannot be implemented as they should be”* (S1). Patient safety is also at risk if a patient with a history of abuse goes to a planned surgical procedure without prior treatment from a psychiatrist or at an addiction center: *“Actually, they should undergo treatment before surgery so that there will be no postoperative conditions such as delirium or abstinence”* (S2).

4) Teamwork

In addition to collaboration with the patient, teamwork between healthcare workers is an important point that affects patient safety. Teamwork is mentioned most often by nurses in areas such as effective sharing of patient information between

services, mutual control of nurses – at least three times before application of medications, but also mentoring or team building to strengthen the adaptation process of newly hired nurses: *“Constant control, either by supervisors or also with each other and mutual communication between colleagues ... that is very important to the safety of the patients”* (S7).

5) Management of missing resources

High-quality workplace equipment significantly contributes to minimizing the occurrence of adverse events: *“So when you have everything at hand, such as sterilized instruments, all prescribed drugs ... then adverse events are minimized because the nurse performs the work comfortably. The nurse focuses primarily on the patient, so the work goes well. Both the nurse and the patient are satisfied”* (S3). Compared to the past, material resources are now available, whereas previously nurses had to improvise, putting the safety of patients at risk. However, even today, important materials are absent, for example those important in preventing pressure ulcers: *“What is missing is then borrowed or manufactured. For example, we do not have heel protectors, and this remains a problem”* (S1). Nurses saw lack of staff as the main problem that affected patient safety. Nurses often work under pressure and under time constraints: *“Most mistakes are made in a hurry, which is probably because there are not enough workers ...”* (S10).

6) Positive patient safety culture

Patient safety culture is an important factor that influences the level of patient safety in hospitals. The basis of safety culture is a culture of openness combined with professional responsibility. Nurses most often associate this phenomenon with senior workers, who they feel should make more effort to create such an environment: *“Definitely an environment where there is a positive culture of patient safety ... then some compliment, verbal or material, for the workers if they report adverse events ... because we know that these events are happening ...”* (S5). Nurses saw the importance of focusing on reporting adverse events and near misses, implementing seminars focused on patient safety issues, and applying preventive strategies based on the analysis of records of reporting adverse events and near misses: *“Management should put more emphasis on reporting adverse event events and near misses. By analyzing these records, the head nurse would be able to apply preventive strategies through which it would be possible to prevent adverse events”* (S9).

Discussion

The main aim of this study was to explore the experience of surgical nurses with adverse events. Firstly, nurses described what, in their opinion, were the most frequently occurring types of adverse event, as well as the factors that contributed to their occurrence and subsequent reporting of adverse events. Based on nurses' statements, it is evident that the most frequent adverse events at surgical workplaces are falls, pressure ulcers, nosocomial infections, and medication errors, which is in line with several international studies (e.g., Nilsson et al., 2016; Schwendimann et al., 2018). According to the authors of Batista et al. (2019), nosocomial infections account for up to 50% of adverse events occurring in surgical workplaces, while other types include wound dehiscence and hematomas. The results of a Swedish study indicate that nosocomial infections together with postoperative complications may occur in more than half of patients admitted to the surgical department. They point out that pressure ulcers and falls are frequent adverse events, especially in patients 65 years and older (Nilsson et al., 2016). In the study by Schwendimann et al. (2018), medication errors and nosocomial infections were the two most frequently cited adverse events. Our results show that medication errors predominate. These results are consistent with the study by Zarea et al. (2018), who emphasize that medication errors are the main errors that contravene healthcare systems and endanger patient health. Similar results were provided in the study by Chang et al. (2022), which revealed that medication errors are the most common events, yet they are the least frequently reported in clinical settings.

Adverse events often have multifactorial causes (Zeeshan et al., 2014), while nurses in our study also stated that several factors were associated with their occurrence, which they perceived as systemic but preventable. The high preventability of adverse events in surgical workplaces has been indicated by several international studies (Batista et al., 2019; Nilsson et al., 2016; Schwendimann et al., 2018), in which preventability ranged from 32 to 90%. Most of the nurses in our investigation attributed the occurrence of adverse events to the influence of an inadequate environment, which, according to them, is related to a lack of staff and is paralleled by a lack of time to provide nursing care. The lack of staff and therefore time results in nurses' inability to meet all the needs of all patients (Shin et al., 2018; Stayt et al., 2022; Zarea et al., 2018). The inability to provide all nursing activities to patients has a negative effect on quality of care, as well as on the

working mood of nurses, who may experience increased workload and stress as a result of these factors. According to the results of a recent study (Stayt et al., 2022), lack of holism, fragmentation of care, and inadequate skill-mix also contribute to the risk of adverse events. Zegers et al. (2011) found that adverse events are most often (up to 65% of the time) the result of human error, i.e., of healthcare workers who provide medical or nursing care. In this context, we can state that the system and the organization are to a significant extent responsible for an individual's mistake (Kalánková et al., 2021). Zegers et al. (2011) simultaneously state that targeted staff training, besides improving quality management, could lead to the elimination of human errors and thus be an effective strategy in the prevention of adverse events. Another important factor was, according to nurses, the failure to provide aids that facilitate movement or those that can be used to prevent falls or pressure ulcers (Pazokian & Borhani, 2017). Our results are supported by the study by Pickering et al. (2017), who state that the occurrence of adverse events is closely related to inappropriate working conditions and insufficient material resources at work. In contrast, Zegers et al. (2011) found a link between insufficient material and technical resources at work and the occurrence of adverse events in only 4.4% of cases. The lack of aids for the implementation of preventive measures can result in their omission and ultimately lead to adverse events such as falls or pressure ulcers (Nilsson et al., 2016). In addition to the factors mentioned, nurses also stated that patients who are restless, aggressive, with cognitive deficits, or after difficult surgical procedures pose potential risks, which is in line with the study by Neuberg et al. (2019). In relation to adverse event reporting, we can state that consistent analysis and adverse event reporting are lacking in the Slovak Republic, which is related to the content of mandatory adverse event reporting. Mandatory reporting of adverse events applies to falls, pressure ulcers, nosocomial infections, and adverse events that have an evident and/or serious impact on the patient's health. Nevertheless, near-misses, incidents, or other adverse events are not reported as often as they should be, or their reporting is completely neglected. The literature indicates that the reporting of adverse events is inadequate and often unreliable (Shin et al., 2018), which was also confirmed in our study. However, inadequate reporting of unsafe incidents is pragmatically accepted in clinical practice, even during the Covid-19 pandemic. Such practice, if accepted, leads to a reduction in the delivery of quality care (Stayt et al., 2022).

The second theme illustrates nurses' opinions on preventive strategies that need to be addressed in the surgical workplace. Nurses saw a comprehensive assessment of the patient's health status as necessary, since it helps to identify at-risk patients and thus plan specific interventions aimed at reducing the given risk. These results are comparable to several studies (Ebi et al., 2019; Mitchell et al., 2018). However, during interviews, we discovered that nurses in surgical settings do not use any measurement tools that could predict risk when assessing the patient. As part of the assessment of the patient's health status, nurses are obliged to use evaluation and measurement tools and techniques that can not only identify a deficit, an unfulfilled need or risk, but also the extent of the need deficit, and the degree of risk. Through their identification of the level of risk and the extent of the deficit, assessment tools facilitate communication between healthcare professionals, which in turn leads to effective planning of targeted interventions (Mitchell et al., 2018). Nurses emphasized in interviews that mechanical falls that occur within the health facility are the result of an inadequate environment or its adjustment. As one of the preventive strategies to minimize the risk of adverse events, nurses mentioned adapting the environment to the patient in terms of free space (passability). Nurses also reported the need to eliminate the risk of falling through the provision of bars, side rails, signaling equipment, and things within the patient's reach, which is consistent with the study of Bergen et al. (2021). Nurses considered it necessary to familiarize the patient with the environment. Additionally, patient safety could be positively influenced by patient education before surgery. For example, Patiraki et al. (2014) also highlight the importance of patient education, which mainly concerns safe movement around the ward, including safe footwear, correct use of signaling equipment, and also safe handling of aids. Nurses saw the establishment of a trusting relationship with the patient as an important step in prevention. Similarly to collaboration with the patient, teamwork between healthcare workers is an important point that affects patient safety and, thus, the quality of care provided to patients. Similar results are demonstrated in the study by Kakemam et al. (2021), in which the relationship between effective teamwork and a lower number of adverse events was demonstrated. Teamwork was mentioned most often by nurses in our study in areas such as effective exchange of patient information between services or mutual control of nurses. Teamwork generally contributes to a safer environment and higher quality of care (Zaheer et al., 2021). As part of efforts to improve

patient safety, nurses saw the management of missing resources, including staff and material, as the last of the key interventions. In conclusion, most of the factors that lead to the occurrence of adverse events are systemic in nature and, therefore, are not the result of inadequate nursing performance (Henriksen et al., 2008).

Limitation of study

This study was limited by the purposeful method of selecting participants and selecting only nurses from surgical workplaces of one hospital. Furthermore, the comparison of findings was limited due to the small number of studies conducted on similar topics, but this should serve as a guide for future studies exploring the experiences of nurses with adverse events. The sample size was relatively small, but the findings were similar to those of other studies, which adds credibility.

Conclusion

Adverse events are an important indicator predicting the quality of care. Their occurrence indicates the level of patient safety in institutional healthcare facilities. Surgical workplaces are at risk of occurrence of adverse events mainly due to surgical procedures. In our study, we found that surgical nurses perceived the most frequently occurring adverse events to be those that are largely preventable. Given that most adverse events are preventable and systemic factors are responsible for their occurrence, we consider it important to focus mainly on the area of risk management with the implementation of interventions that will result in the elimination of adverse events. This will contribute to the promotion of patient safety, which will not only have a beneficial effect on the patient but will also encourage a positive culture of safety with an impact on the provision of care in an institutional health facility.

Ethical aspects and conflict of interest

The research study was approved by the head of the nursing department of the selected teaching hospital. Participation in the research was subject to informed consent. The research was carried out according to the recommendations of the Declaration of Helsinki. The demographic data of the participants was processed in accordance with the regulation of the European Parliament and the EU Council 2016/679 of 27.04.2016 on the protection of persons in connection with the processing of personal data and the free movement of such data.

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Author contributions

Conception and design (DK, SB, KŽ), data collection (DK, SB), data analysis and interpretation (DK, SB), manuscript draft (DK, SB, RK, KŽ), critical revision of the manuscript (RK, KŽ), final approval of the manuscript (DK, SB, RK).

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