Journal of Health Study and Medicine
2019, nr 3
ss. 147-174
DOI 10.36145/JHSM.2019.24

Causes and Consequences of Adverse Events in the Work of Nurses – Theory and Practice

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Abstract

Introduction: *The specificity of the nurse's work makes it a profession particularly vulnerable to the occurrence of adverse events and their frequency is still increasing. This makes it particularly difficult to ensure a high level of patient safety.*

Objectives: *The aim of this study was to investigate the causes of adverse events among nursing staff and the level of knowledge about adverse events and consequences resulting from their reporting.*

Material and methods: *Diagnostic survey method and literature analysis were used. A questionnaire technique was used. The author's questionnaire was used as a research tool. The study group consisted of 102 nurses working in hospitals in Trojmiasto.*

Results: *After analysing the obtained study results, there were significant similarities to the results obtained from other studies carried out on adverse events.*

Conclusion: *Even though most nursing staff reports the occurrence of adverse events, some events are still not reported, and the nurses' level of knowledge about the adverse events monitoring system is insufficient.*
Key words: nurses, adverse events, patient safety

Abbreviations

CMJ	Quality Monitoring Centre for Health Care
JCAHO	Joint Commission for Accreditation of Healthcare Organizations
NAM	National Academy of Medicine
RCA	Root Cause Analysis
SAC	Safety Assessment Code Matrix
WHO	World Health Organization
AE	Adverse Event

Introduction

Nursing is a profession that is constantly evolving and strives to provide the patient with the best conditions to maintain physical and mental health. One of the overarching goals of professional care is to provide the patient with high-quality medical services by ensuring their safety during hospitalisation. However, not only nurses, but many representatives of the medical professions (doctors, pharmacists, social workers, dietitians) participate in the treatment process. For this reason, it may be difficult to ensure patient's safety during treatment if the care system does not allow full information to be exchanged in a timely manner between all healthcare providers involved in the care process [1].

The specificity of the nurse's work makes this profession particularly vulnerable to the occurrence of adverse events.

Their number is still increasing. According to WHO (World Health Organization), medical errors affect every tenth patient, and from the data published in European Commission documents, it can be concluded that adverse events affect 8-12% of all patients who are hospitalised in the EU countries [2].

In Poland, adverse events are rarely reported by medical staff. This is due to the fear of consequences resulting from the event. For this reason, it is not possible to accurately determine their actual number. Adverse events, however, do not occur because of deliberate action of medical personnel to the detriment of the patient, but result from the complexity of functioning of health care systems, in which the effective results of treatment and therapy of each patient depend not only on the skills of individual employees, but on many factors [3].

Definition and types of adverse events

At the end of the 1990s, three comprehensive studies on medical errors were published – studies at Harvard University, studies on the quality of healthcare in Australia, and studies in Utah and Colorado, which highli-

ghted the importance of the concept of an adverse event [4]. Although adverse events are usually the result of medical intervention, not all adverse effects of treatment are the result of an error. Reflecting this fact, many researchers suggest that only avoidable adverse events can be attributed to medical error [5].

It is believed that a medical error occurs when a doctor, nurse or other medical employee did not exercise due diligence during their professional activities or exceeded his competences as a result of which the patient lost their life or health [6].

The Act of 6 November 2008 on patient rights and the Patient Ombudsman introduces the concept of a medical event. They should be distinguished from medical error, because a medical event is a broader concept [7].

The notion of medical occurrence refers to: "Infection of the patient with a biological pathogen, bodily injury or disturbance to the patient's health or death of the patient as a consequence of inconsistent with current medical knowledge:

1. diagnosis, if it caused improper treatment or delayed proper treatment, contributing to the development of the disease,
2. treatment, including surgery,
3. use of the medicinal product or medical device."

To consider a given situation as a medical event, the following criteria must be met: occurrence of the described effect (infection, injury, death) following a diagnosis, treatment or use of a medical product that is not in accordance with current knowledge [8].

If the above-mentioned situations occur, the patient has the right to seek damages or compensation and may apply for a medical incident to be established. Then, proceedings are pending before the voivodship commission for adjudicating on medical events competent with regard to the location of a given hospital [9].

According to some authors, the term "error" carries a stigma that can cause negative feelings, such as guilt and anger. They maintain that the term "error" is unduly negative and strengthens the culture of seeking

guilty. A doctor or nurse whose self-confidence and morale have been damaged by the error may act less effectively and efficiently and may even consider giving up a career in medicine [10].

Recently, the concept of medical error has been replaced by the concept of adverse event.

According to NAM, an adverse event/harm event is an unintended, but not always unexpected result of medical treatment. According to JCAHO (Joint Commission for Accreditation of Healthcare Organizations) and CMJ (Centre for Quality Monitoring in Health Care), this damage occurred during or as a result of treatment, but not related to the natural course of the disease and the patient's health. It is also a risk of damage. We can also distinguish a near-miss adverse event. It is a situation which, thanks to an action taken or by accident, ended successfully (the event did not affect the patient and no damage occurred) [11].

The currently accepted categorisation of adverse events was developed by the Canadian Patient Safety Institute in 2012 (Fig. 1).

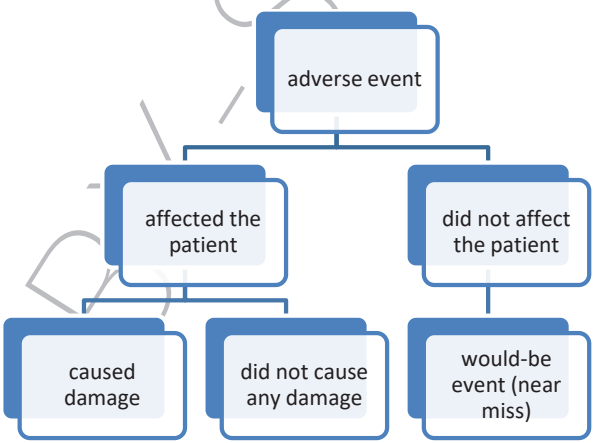

Figure 1. Categorisation of adverse events

Source: own, on the basis of [11].

Adverse events may include:

- clinical activities: incorrect identification of the patient, the surgical site, procedures, foreign body left in the operating field, incorrect diagnosis, failure to provide care;
- pharmacotherapy: wrong medicine, wrong dose, wrong patient, wrong time of drug administration, solvent, route of administration, administration after expiration date [12].

A common mistake made by nurses includes the performance of medical orders that were not entered in the individual medical order sheet. This is the only document on the basis of which nurses can perform medical procedures. This obligation is regulated by the Regulation of the Minister of Health of December 21, 2006 on the type and scope of medical documentation in healthcare facilities and how it is processed (Journal of Laws of 2006, No. 9, item 45). It often happens that the entered medical orders are illegible or incomplete, which may cause a mistake. The risk of making a mistake increases especially when the tasks are carried out by overworked staff and in a hurry [13].

Adverse events may also include:

- transfusion of blood and its components: incorrect identification of the patient, administration of the wrong unit, other activities related to transfusion of blood, blood products;
- medical equipment, work organization: equipment failure, lack of availability of medical devices, insufficient on-call staff;
- other: e.g. falls, suicides, suicide attempts [12].

Adverse events that affected the patient and cause harm constitute a limited subset of all medical errors. Most errors do not cause injury to patients, because the error was identified in time and mitigated, the patient was immune or because of mere luck. Error cause model – „Swiss cheese model" (Fig. 2.) James Reason illustrates how this concept applies to healthcare [10].

According to him, most complex systems and work environments, such as hospitals, have several layers of protection that provide protection against the negative consequences of error (marked by se-

veral pieces of Swiss cheese). Despite these safeguards, each layer of protection has numerous holes or flaws (holes in individual slices). Patient injury occurs only when circumstances arise that cause the defects of each of the individual layers of protection (or holes in the slices of cheese) to level out in a way that allows the error to penetrate their protection and reach the patient [4].

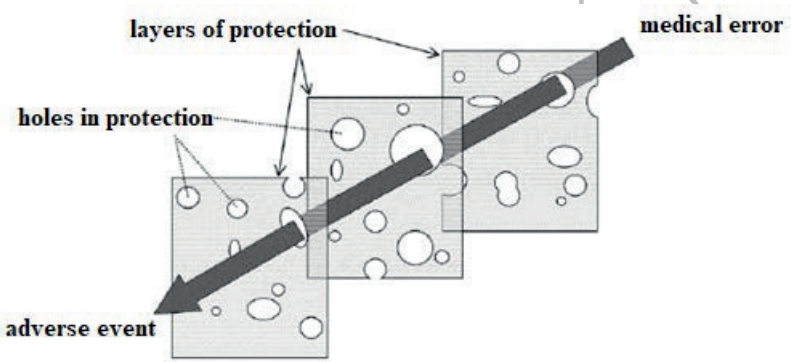

Figure 2. Swiss cheese model
Source: [4], p. 42.

Currently, the phenomenon of "dissociation of medical error" is being discussed. This means that there are many reasons that lead to an adverse event. One of them is ergonomic problems in the work of nurses. Among them, there are factors such as:

- shift work, overtime, night time,
- interpersonal conflicts, time pressure, constant stress,
- insufficient nursing staff,
- exposure to chemical, biological or physical agents [15].

The table below presents a detailed list of factors that may contribute to errors in clinical practice.

Table 1. Factors affecting the occurrence of errors

FACTOR TYPE	ASSOCIATED FACTORS
Factors that depend on the patient	Health Language and communication Personality, social factors
Factors related to the implemented tasks and the way they are performed	Assigning tasks Availability of protocols and their use Accuracy and availability of results Measures to help decision making
Staff-related factors	Knowledge and skills Competence Mental and physical health
Teams-related factors	Written communication Verbal communication Seeking support Team structure
Work environment-related factors	Employment level Workload Equipment availability Support for managers Working environment Physical factors
Management and organization-related factors	Financial resources Organisational structure Policy, goals and standards Safety culture
Factors related to the organization and its functioning	Organisation finances Health care organisation Relations with other organizations

Source: [12].

Adverse event monitoring system – assumptions

Researchers in human factors have acknowledged the importance of recognising errors (with appropriate timely feedback) as a powerful tool for learning, shaping behaviour, and achieving goals. Adverse event monitoring systems are designed to enable learning from their mistakes [14].

At the beginning of 2017, the Ministry of Health submitted for public consultation draft assumptions for the bill on quality in health care and patient safety, which aims to introduce legal and organisational solutions to the Polish health care system to achieve the overarching objectives of

health policy regarding the quality of services provided, primarily due to the implementation of quality and safety monitoring systems, reporting and analysis of adverse events, risk management, medical records and the accreditation system for healthcare entities [18].

The bill involves the creation of an Agency for the Quality of Health Care and Patient Safety to replace the Quality Monitoring Centre for Health Care. Its task is to constantly monitor the quality of work of entities carrying out medical activity in the area of obligations resulting from the draft provisions, including operating an adverse event monitoring system [18].

System assumptions

According to the assumptions of the project of the Ministry of Health from July 1, 2019, the obligation will be implemented to monitor adverse events, as well as to report them to the Agency for Health Care Quality and Patient Safety. Based on the obtained information about high risk events, it will analyse and give recommendations that will be presented as so-called security messages. An adverse event monitoring system is necessary to identify solutions to improve patient safety [16].

This system is a response to the expectations of society and is also an indicator of the level of risk in the health care system and helps improve the quality of services provided. Currently, the register of medical events and drawing constructive conclusions from their analysis is one of the elements in assessing the quality of medical care in the hospital accreditation program. Accreditation forces the analysis and collection of data on the clinical activity of the therapeutic entity, including adverse events [12].

According to the assumptions of the system, all engaged persons should participate in the reporting of adverse events, not only medical personnel but also patients and their families. Reporting is voluntary, unencumbered, and reported information about the event, while the data of the reporting person is confidential [12].

The adverse event reporting system works independently of other systems and regulatory processes in force (professional and criminal liability system, system of complaints). The content of the reports is protected against court and prosecutor's insight, and the person reporting the event should not be subject to any judicial or disciplinary proceedings.

The system is not intended to find a person responsible for the occurrence of an event. Attributing blame is considered to be the main limitation of the health care system, which makes it difficult to improve the quality of care and manage risk properly [17].

Reporting an adverse event is based on an established form, and its analysis is carried out according to specific guidelines – the London Protocol or root cause analysis (RCA) [12].

Adverse event reporting procedure

The management of the healthcare entity decides to introduce a system for reporting an adverse event. They also appoint a leader and team, define their tasks and scope of responsibility, and introduce patient safety policy in the entity. They present assumptions and concepts to subordinate staff. Support the leader in their work and are responsible for introducing new recommendations [18].

When an adverse event occurs, it is very important to provide medical care, inform the patient or their family about the event, emotional support for the patient and personnel participating in the event, proper protection of medical items and documentation. Adverse event can be reported by both medical and non-medical staff up to 24 hours after its occurrence by completing an electronic or paper form.

In accordance with WHO recommendations, the form needed to report an adverse event should contain elements such as: employee data, their position, patient data (age, gender, General Ledger number), event location, time of occurrence of the event, factors that influenced the occurrence of the event, event categorisation, result of the event (for the hospital and the patient), direct reaction after the event, comments

and notes. Data such as time and location of the event, as well as patient and reporting person's data are deleted after 14 days from reporting [12].

The adverse event report is sent to the team leader who reads the report and decides to carry out the analysis and explanation or to withdraw from it. Then selects the analysis method. The composition of the team which carries out the analysis of the request, searches for existing problems and conducts proceedings to investigate the event is determined. Interviews with participants of the incident are carried out, the severity and likelihood of occurrence are assessed, and root cause analysis done. To assess the severity of the event and the likelihood of occurrence, the SAC safety evaluation matrix giving a point score is used (Table 2). It was developed by the National Patient Safety Centre at the Department of War Veterans [12].

Table 2. Event Safety Evaluation Matrix

SAFETY EVALUATION MATRIX	GRAVITY OF THE EVENT			
	disastrous	important	moderate	irrelevant
PROBABILITY				
RARE	3	3	2	1
FREQUENT	3	2	1	1
EXTRAORDINARY	3	2	1	1

Source: [19], p. 15-20.

Each event can receive from 1 to a maximum of 3 points. Its value is determined on the basis of the intersection of a given column and row in the table above (1 point means low threat, 2 moderate, 3 high threat, high damage). An event scored at 3 points indicates a serious adverse event [19].

The incident analysis can be based on the RCA (root cause analysis) model recommended for the analysis of serious events, which was developed by the US National Patient Safety Centre at the Department of Veterans' Affairs or according to the British model – London Protocol.

The team determines additional factors that may have led to an adverse event. The most important questions when analysing the causes of an adverse event are: "What happened?", "When did it happen?", "How did it happen?", "What to do so that it does not happen again?". This makes it possible to find the reasons for the event, and not the person responsible for the adverse event [12].

After analysing the event, the recommendations are defined and implemented to prevent a similar adverse event from occurring in the future. These can be, among others, training for staff. Active management of the branch is essential at this stage. The effectiveness of introduced changes and solutions is also monitored. The person who reported the occurrence of an adverse event is given feedback on the analysis of the event (Fig. 3). A very important element is also the dissemination of information about the implemented solutions and necessary changes. The entire process of analysing an event should take about 10 days from the time when the adverse event occurred [19].

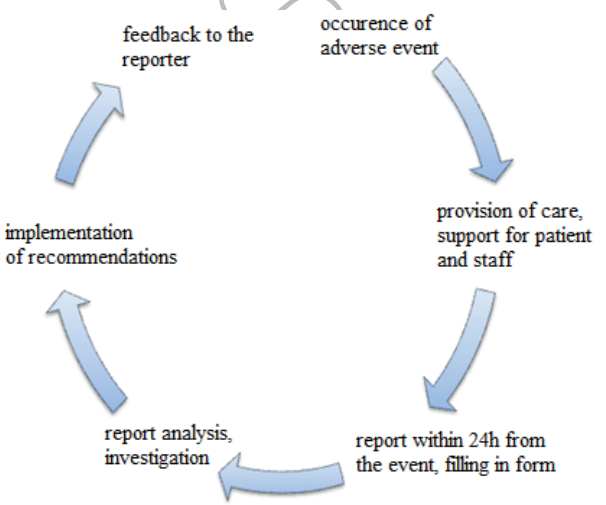

Figure 3. Adverse event reporting procedure

Source: [19], p. 5-26.

Developing a strategy after the analysis should be based on factors that are important for patient safety. Recommendations that fall within the management's competence should be implemented.

Adverse event analysis teams

Adverse events considered serious and the near-miss adverse events should be analysed using root cause analysis (RCA) [12].

The analysis is performed by a special team that is appointed by the management of the medical entity. It is resolved after the event analysis is completed. A person who appears in each team for adverse event analysis is the team leader. A specially trained person in the field of patient safety can be a leader. The leader and the management decide who of the people involved in the adverse event will be in the team. There are usually 4 to 10 people in a team. There is also the possibility of ad hoc appointment of experts in various fields that are helpful in analysing the event. It is significant that the team should include a person who is a representative of the management of the medicinal entity [19].

An important element is to schedule the team's work (meeting dates, meeting place, supporting materials). Meetings of the entire team take place according to a predetermined order, at a specific time and are mandatory, absence is only allowed in exceptional cases. The management is responsible for ensuring that the team has sufficient time for their work. Meetings should be held on a neutral ground, i.e. in a place that is distant from the ward in which the event occurred. Usually two to three such meetings take place, each lasting about two hours. In addition, the time needed by the team leader to analyse a given case, conduct interviews, visit the incident site, and prepare a final report should be taken into account [19].

The legal aspect of adverse events

The system assumes the exclusion of legal consequences for persons who report an adverse event (the exception is intentional fault or negligence)

and prevents access, including judicial or prosecutor's insight, into the content of data that is collected in the adverse events monitoring system. The assumptions of the project show that a person who reports such an event will not be subjected to disciplinary proceedings by their employer and will not be subject to criminal liability (excluding intentional fault or negligence) [8].

If an adverse event occurs, the employer should begin the analysis process and corrective actions that will not be aimed at finding and blaming the person responsible for the error, and above all the functioning systems that contributed to the error.

The difference between the terms "adverse event" and "medical event" should be emphasised. The occurrence of a medical event is the basis for initiating proceedings before the Provincial Commission for Adjudication on Medical Events [20].

Unlike medical events, an adverse event is usually characterised by the lack of premises that would trigger liability (there is no fault, there is no cause and effect relationship between the operation of hospital staff and the resulting damage, there was no incompatibility with current medical knowledge) [21].

Responsibility for a medical incident is sought before voivodship commissions for adjudicating on medical incidents on the basis of the Act on Patient Rights and the Patient Ombudsman of November 6, 2008. Medical events nowadays are increasingly the cause of lawsuits. There is also a tendency to award higher and higher amounts due to the patient for compensation and redress [8,20].

The Adverse Events Registry cannot constitute a source of claims for recipients, but should serve as a tool that will contribute to eliminating the causes of adverse events. The experience of countries where monitoring of adverse events has been functioning for many years shows that the elimination of punishment and personalisation during reported adverse events facilitates the functioning of the entire system, encourages reporting these events and promotes the improvement of care safety [12].

A nurse practising their profession must be prepared for the consequences of mistakes made. They should familiarise themselves with the applicable legal regulations regarding their profession in order to do their work fully consciously and safely. This applies, among others, to execution of medical orders. The nurse is obliged to enforce legible and understandable entries in the order sheet, because in the event of a mistake they will be responsible for the mistake [22].

Objectives

The aim of the study is to investigate the causes of occurrence and knowledge about adverse events and the consequences of reporting them among nursing staff.

The following research hypotheses were formulated:

- The most common cause of adverse events is staff stress and fatigue (ergonomic problems).
- Nursing staff are aware of the consequences of an adverse event.

Material and methods

The study was addressed to a group of nurses working in hospital wards in two hospitals in Trojmiasto. The study was conducted from February to March 2019. Sampling was random and participation in the study was fully anonymous and voluntary.

The diagnostic survey method and literature analysis were used in the work. A questionnaire technique was used. The author's questionnaire consisting of 17 questions, including 14 closed questions and 3 semi-open questions, was used as a research tool.

Among the distributed questionnaires, 102 sheets were completed correctly and were used for further analysis using MS Excel. A descriptive, statistical and graphic method was used to present the results of the research.

Study results

The most numerous group among the respondents – 41% were respondents over 50 years of age, 31% were in the range from 41 to 50 years of age, and the least respondents (8%) aged 31-40 years of age (Fig. 4).

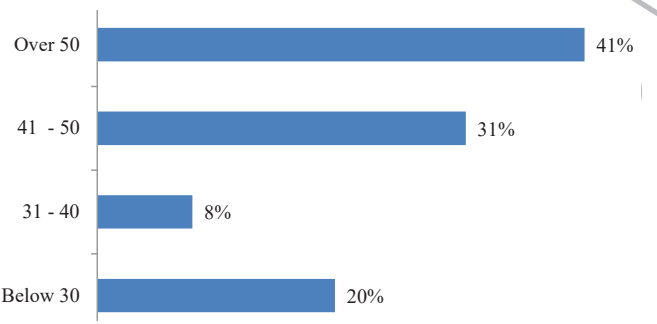

Figure 4. Age of the respondents

The highest percentage (40%) were respondents who graduated from medical vocational school, 23% of respondents had a bachelor's degree in nursing, while 12% had a master's degree in nursing (Fig. 5).

The most numerous group among the respondents (52%) were people with more than 25 years of experience, 21% of the respondents had 16 to 25 years of experience, 8% from 6 to 15 years, while 20% of the nurses surveyed had up to 5 years of work experience (Fig. 7).

Analysis of knowledge about adverse events

When asked if they had ever witnessed an adverse event, most of the respondents – 80% – said they had observed the occurrence of an adverse event, 13% replied that they had not yet observed an adverse event, and 7% of respondents said they did not know whether they had ever observed an adverse event (Fig. 6).

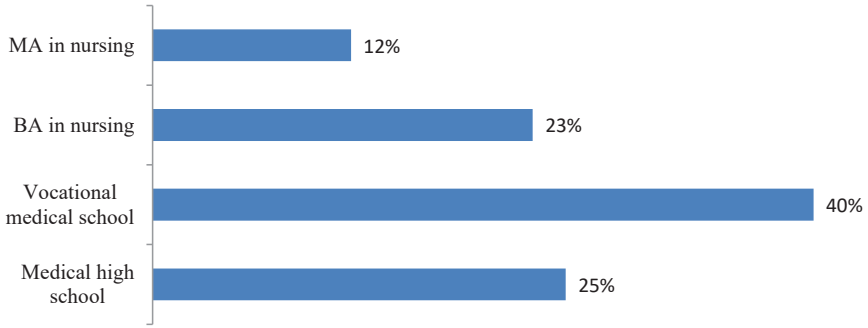

Figure 5. Education of the respondents

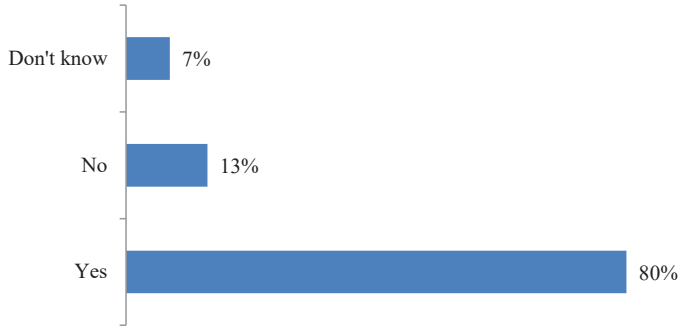

Figure 6. Responses

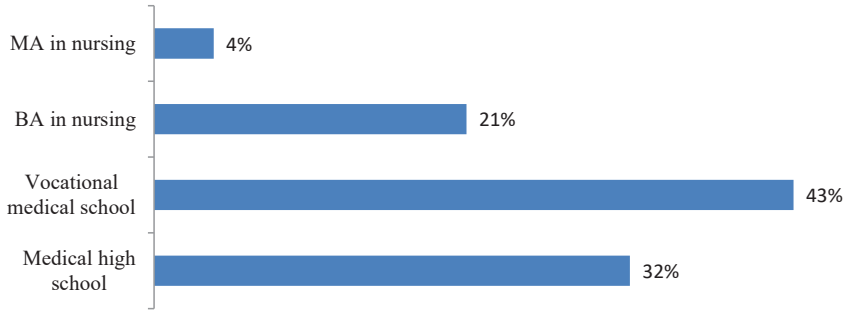

Figure 7. Education of respondents who answered incorrectly the question of who can report an adverse event

Among the surveyed nurses who answered positively to the above question, every second person had more than 25 years of experience in the profession, 17% from 16 to 25 years of experience, 10% from 6 to 15 years and 24% of the respondents who have ever observed an adverse event had up to 5 years of work experience in the profession.

Also, 90% of respondents said that they know how to report the occurrence of an adverse event.

The next question checked the knowledge of the respondents about who can report the occurrence of an adverse event. The correct answer is the answer: „An adverse event can be reported by any employed person". This is how 48% of respondents answered, while the majority of respondents – 52% – incorrectly stated that an adverse event can only be reported by medical personnel.

Among those who answered the above question incorrectly, 43% had graduated from medical vocational school, 32% medical high school, 21% had a bachelor's degree in nursing, and 4% had a master's degree in nursing (Fig. 7).

Also, 70% of respondents said that they always reported the occurrence of an adverse event when they observed it, while every third person did not always report such an event. More than half of the respondents claimed that a monitoring system for adverse events is needed (56%), 26% said that in their opinion such a system is not needed, and 18% have no opinion.

Respondents were asked whether they believe that the adverse event reporting system works independently of other systems, such as the complaint or criminal liability system. The correct answer is yes. The adverse event monitoring system works independently of other systems. Only 35% answered positively to the question, 19% answered that the system does not work independently of other systems. However, the largest number of respondents in the study group – 46% – did not know the answer to the question (Fig. 8).

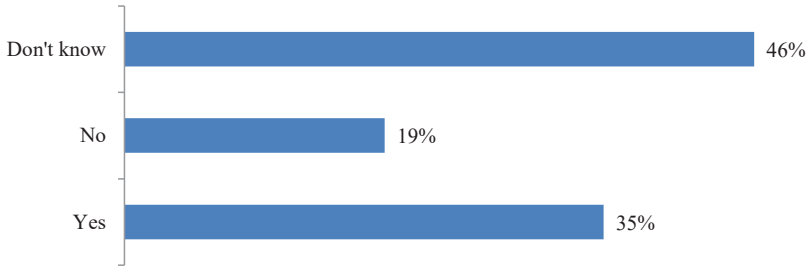

Figure 8. Knowledge of respondents about the operation of the AE monitoring system

Most respondents indicated the most frequent adverse event as mistake in drug administration (42%), falls – 29%, incorrect identification of the patient was indicated by 13%, failure of medical equipment – 12%, lack of equipment availability – 3%, other adverse events were indicated by 1% of respondents, mentioning employee infection here (Fig. 9).

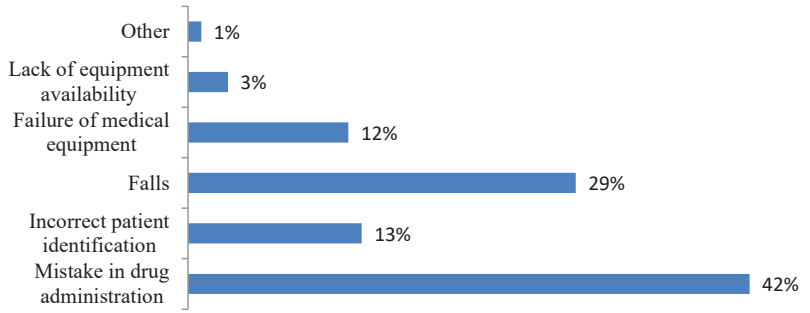

Figure 9. Types of AE occurrence according to respondents

42% of the respondents indicated the wrong patient as the type of adverse event most often occurring in the event of a drug mistake, 29% indicated the wrong dose, 26% of the respondents indicated the wrong drug, while the wrong route of administration was indicated by 2% of the nurses surveyed.

Most of the respondents indicated stress and fatigue (42%), insufficient nursing staff during on-call duty – 32%, 14% of respondents indicated poor communication in the team, 10% shift work, 3% wrong organization of the workplace. No response was reported regarding exposure to biological, chemical and physical agents (Fig. 10).

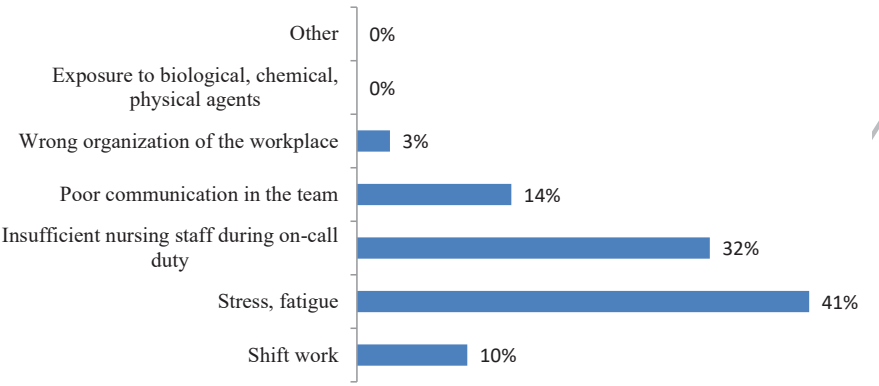

Figure 10. Factors impacting the occurrence of AE

Respondents were asked whether they were aware of the consequences of reporting an adverse event. Most respondents – 86% said they were aware of these consequences, while 14% said they were not aware of them.

The knowledge of the surveyed nurses about whether persons reporting an adverse event could be subject to disciplinary or court proceedings by the employer was also checked. The analysis showed that 42% of respondents did not know the answer to the question asked. 32% of respondents said that persons reporting an event could not be subject to such proceedings, while 25% of the surveyed group replied that a person reporting an adverse event could be subject to disciplinary or judicial proceedings by the employer (Fig. 11).

The respondents answered the question about the knowledge of how the risk management system works. 44% of respondents answered affirmatively, 9% of respondents did not have knowledge about this topic, while almost every second person (47%) among the respondents did not know the answer to the above question (Fig. 12).

According to 61% of respondents, ensuring a high level of patient safety is affected by taking actions to eliminate the cause of an undesirable event, 15% indicated the implementation of corrective and preventive actions, 14% of respondents – analysing and drawing conclusions, responsibility for their actions and actions of colleagues having impact on patient safety was indicated by 11% of respondents (Fig. 13).

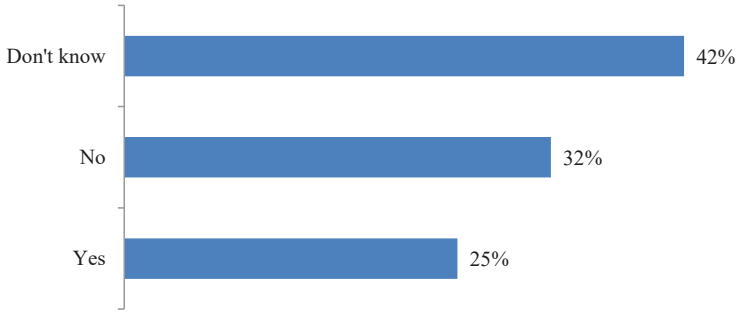

Figure 11. Respondents' knowledge about the behaviour of the employer after reporting the AE

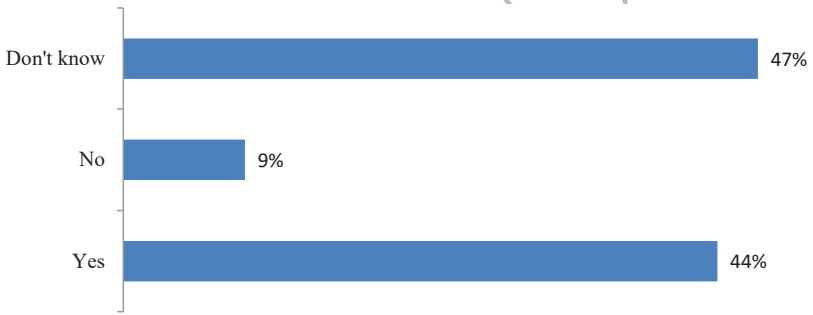

Figure 12. Respondents' knowledge of the risk management system at their workplace

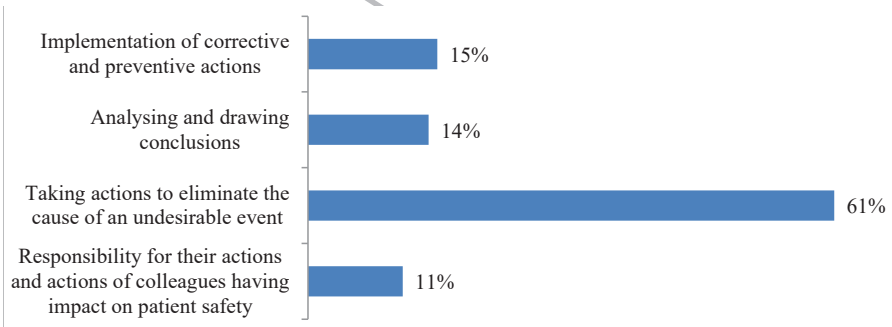

Figure 13. Actions affecting patient safety

Discussion

The aim of the study was to investigate the causes of occurrence and knowledge about adverse events and the consequences of reporting them among nursing staff. The obtained results of the study responded to the research problems posed and partly confirmed the previous hypotheses.

Adverse events are a serious health care problem. According to WHO and the European Commission research, the incidence of adverse events is steadily increasing. According to them, 27% of the European Union citizens surveyed have personally experienced an adverse event or the respondent's family has experienced it. [23].

Our own research shows that 80% of the surveyed nurses witnessed an adverse event. Nurses with longer work experience were more likely to witness such an event. Almost half of them had over 25 years of professional experience. Similar are the results from research conducted in 2015 by the Society for the Promotion of Quality of Health Care in Poland. According to them, the youngest staff were the least frequently involved in adverse events [24].

Most of the surveyed nurses (56%) thought that an adverse event monitoring system was needed, and almost all (90%) said they knew how to report an adverse event. Despite this, they still do not always report the occurrence of such an event.

Of the respondents who observed an adverse event, 30% did not always report this fact. Similarly, the research conducted by Mayo and Duncan, according to which only 45.6% of the examined group of nurses believe that all adverse events are reported [25].

The vast majority of respondents (86%) said they were aware of the consequences of reporting an adverse event. However, the results of the study prove that nurses' knowledge of adverse events and their consequences is still low.

Over half of the respondents (52%) incorrectly stated that only medical personnel can report an adverse event. Only 35% of respondents said that the adverse event monitoring system works independently of other

systems. Only every third person answered correctly the question about the employer's conduct towards the employee after reporting the incident. Every fourth person believes that after reporting a ZN, they may be subject to disciplinary or court proceedings, and only less than half of the respondents (44%) knew that a risk management system was enabled in their workplace.

It is probably the above mentioned factors, such as insufficient knowledge of nursing staff about adverse events and their consequences, that not all of the occurring AEs were reported. Similar results present the research of Fry and Dacey. According to them, the frequency of reporting adverse events is significantly influenced by the level of nurses' knowledge about AE [26].

However, research by Tang et al. shows that the most common reasons for nurses not reporting adverse events include emotional factors such as guilt, fear and fear of colleagues' reaction [27].

In the study, respondents indicated a mistake in drug administration (42%) as the most common adverse event. Most often, this type of event was considered to be associated with misidentification of the patient. The same is confirmed by research carried out by the Society for the Promotion of Quality of Health Care in Poland. It shows that the most common problem is drug-related adverse events. Every fifth respondent (20.2%) encountered them, and every fourth (26.8%) in medical treatment wards [24].

In the own study, the most common cause of adverse events among nurses the respondents indicated the ergonomic problems such as stress and fatigue (41%), followed by insufficient nursing staff during on-call time (32%). The results of the Society for the Promotion of Quality of Care report indicate similarly. Respondents considered the staff's too high workload to be a reason for the occurrence of AE. As much as 87.5% of respondents agreed with this [24].

The results of the RN4CAST study also confirm that excessive workload, which results from insufficient nursing staff, can lead to many negative phenomena, such as underestimating the quality of medical care provided and increasing patient mortality [24].

In the survey of the Society for the Promotion of Health Care Quality, every third person indicated the exchange of personnel experience as a potential opportunity to prevent adverse events. Medical staff also pointed out the need for further education and training related to caring for patient safety and thereby preventing adverse events [24].

In own study, three out of five respondents (61%) considered taking action to eliminate the cause of an adverse event as an effective method to ensure a high level of patient safety. This answer outweighs the other answers significantly.

After analysing the results of own research, it can be concluded that there are significant similarities to the results obtained from other studies conducted to date on adverse events. Although most respondents report an adverse event, these actions are still not sufficient. Organising training for nurses that complement their knowledge of adverse events and their potential consequences could significantly affect the frequency of reporting.

Conclusions

1. Nurses with more years of experience more often observe adverse events.
2. Nurses do not always report an adverse event if they observe it.
3. An adverse event monitoring system is needed.
4. Nurses' level of knowledge about the adverse event monitoring system is insufficient.
5. Not all nurses are aware of the consequences of adverse events.
6. The main cause of adverse events are ergonomic problems, including staff stress and fatigue, and insufficient nursing staff during on-call time.
7. The most common type of adverse event among nurses is a medication error due to misidentification of the patient
8. Ensuring a high level of patient safety is influenced by taking action to eliminate the occurrence of an adverse event.

References

1. Pokorski J. Medyczne i pozamedyczne czynniki bezpieczeństwa pacjenta oraz jakości w opiece zdrowotnej. Streszczenia. Konferencja: Bezpieczeństwo pacjenta w ujęciu holistycznym. Kraków; 2014. p. 42-43.

2. Bała M, Gajewski P. Zdarzenia niepożądane jako element oceny jakości opieki medycznej w programie akredytacji szpitali. Medycyna Praktyczna 2012; 1: 121-125.

3. Brennan TA, Leape LL, Laird NM et al.: Incidence of adverse events and negligence in hospitalized patients: results of the Harvard Medical Practice Study. The New England Journal of Medicine 1991; 324(6): 370-376.

4. Grober E, Bohnen J. Defining medical error. Canadian Journal of Surgery 2005; 48(1): 39-44.

5. Kohn LT, Corrigan JM et. al. To err is human: building a safer health system. Washington: National Academy Press; 2000.

6. Marczewska S. Błąd medyczny w pielęgniarstwie. Niczego nie ukrywać! Magazyn Pielęgniarek i Położnych 2010; 12: 24-25.

7. Brzezińska-Grabarczyk D. Zdarzenia medyczne. In: Brzezińska-Grabarczyk D, Narolski M, eds. Prawo o działalności leczniczej w praktyce. Przekształcenia zakładów opieki zdrowotnej. Warszawa; 2012. p. 150.

8. Serwach M. Odpowiedzialność za zdarzenia medyczne według nowego prawa – pytania i odpowiedzi. Medycyna Praktyczna 2011; 9: 122.

9. Serwach M. Odpowiedzialność za zdarzenia medyczne – nowe regulacje prawne. Medycyna Praktyczna 2011; 6: 106.

10. Reason JT. Understanding adverse events: the human factor. In: Vincent C. Clinical risk management: enhancing patient safety. London: BMJ Publishing Group; 2001. p. 9-30.

11. Beard P, Hoffman CE et al. Canadian Incident Analysis Framework. Canadian Patient Safety Institute; 2012.

12. Czarnecka G, Czauderna P et al.: Bezpieczeństwo pacjenta: monitorowanie zdarzeń niepożądanych. Kraków: Centrum Monitorowania Jakości w Ochronie Zdrowia; 2018.

13. Piątek A. Błędy i wykroczenia w praktyce zawodowej pielęgniarek i położnych a bezpieczeństwo pacjentów. Zdrowie Publiczne 2005; 115(4): 465-470.

14. Reason JT. Managing the risks of organizational accidents. Aldershot: Ashgate; 1997.

15. Pokorski J. Ergonomiczne uwarunkowania błędów medycznych. In: Pokorski J, Pokorska J, Złowodzki M, eds. Błąd medyczny. Uwarunkowania ergonomiczne. Kraków: PAN; 2010. p. 205-225.

16. Tevis S, Schmocker R, Wetterneck T. Adverse Event Reporting: Harnessing Residents to Improve Patient Safety. Journal of Patient Safety 2017 October [Epub ahead of print].

17. Gault W. Blame to aim, risk management in the NHS. Risk Management Bulletin 2002; 7: 6-11.

18. Borek E, Janus A et al. Raport bezpieczny pacjent – kierunki koniecznych zmian systemowych; 2017.

19. Kutryba B, Kutaj-Wąsikowska H et al. Zdarzenia niepożądane. Analiza przyczyn źródłowych zdarzeń niepożądanych. Centrum Monitorowania Jakości. Kraków; 2015. p. 5-26.

20. Chojnacki J. Przyczyny oraz konsekwencje prawne zdarzeń niepożądanych oraz zdarzeń medycznych. Bezpieczne warunki pracy pielęgniarek i położnych – materiały konferencyjne. Warszawa; 2018. p. 44-54.

21. Kaźmierski A, Pachciarz A et al. Meritum Prawo Medyczne. Warszawa: Wolters Kluwer; 2016. p. 415-416.

22. Kieczka K. Opieka profesjonalna i zakres kompetencji pielęgniarek w Polsce w świetle prawa w ostatnim stuleciu. Pielęgniarstwo XXI w. 2010; 1-2: 81-86.

23. European Commission: Patient Safety and Quality of Care. Special Eurobarometer report 411 [Internet]. June 2014. Available from: http://ec.europa.eu/health/patient_safety/docs/ebs_411_en.pdf [cited 21.09.2017].

24. Towarzystwo Promocji Jakości Opieki Zdrowotnej w Polsce: Badanie opinii personelu lekarskiego i pielęgniarskiego na temat zgłaszania zdarzeń niepożądanych oraz wymogów, jakie winny spełniać systemy raportowania w opiece zdrowotnej. Kraków; 2015. p. 79-127.

25. Mayo AM, Duncan D. Nurse perceptions of medication errors: what we need to know for patient safety. Journal of Nursing Care Quality 2004; 3(19): 209-217.

26. Fry MM, Dacey C. Factors contributing to incidents in medicine administration: Part 2. British Journal of Nursing 2007; 16(11): 676-681.

27. Tang FI, Sheu SJ, Yu S, Wei IL et al. Nurses relate the contributing factors involved in medication errors. Journal of Clinical Nursing 2007; 16(3): 447-457.

28. Cisek M, Przewoźniak L et al. Obciążenie pracą podczas ostatniego dyżuru w opiniach pielęgniarek pracujących w szpitalach objętych projektem RN4CAST. Zdrowie Publiczne i Zarządzanie 2013; 11(2).