

RISK MANAGEMENT IN THE CLINICAL HEALTH CARE PROCESS

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Risk management in the process of nursing clinical practice is a systematic process that requires expertise and skills in risk prevention. Patient safety at the hospital is the primary goal of every individual providing health care service, and at the same time of the organizations. Accordingly, it is necessary to develop strategies that minimize the risks in the hospital and successfully address adverse events in practice. The main hypothesis was that risk management in the healthcare process has a positive impact on the quality and safety of healthcare service. The following goals were set: 1) to identify the most common risks reported in the healthcare process; 2) to examine the ways and models of risk prevention in the healthcare process in hospitals; and 3) to examine the practice and attitude of nurses in the process of managing risks and adverse events. The survey was conducted among 115 nurses/medical technicians employed at the public health institutions-hospitals in the Federation of Bosnia and Herzegovina. The survey used the original questionnaire prepared by the authors in the electronic Google forms, which was available to the respondents via personal e-mail address, and they responded completely independently without the influence of another person. Comparison of risk events in practice showed a statistically significant decrease with advancing age of the respondents ($\rho=-0.274$; $p=0.003$), longer work experience of the respondents ($\rho=-0.334$; $p=0.0001$), higher education of the respondents ($\rho=-0.198$; $p=0.034$), conducting patient categorization ($\rho=-0.289$; $p=0.002$), and policies and procedures adopted ($\rho=-0.408$; $p=0.0001$). A statistically significant effect on reducing the number of adverse events per patient was shown for the frequency of examination of patient skin and mucous membranes during hospital stay ($\rho=-0.200$; $p=0.032$), use of scales to assess the risk of falls ($\rho=-0.422$; $p=0.0001$), use of risk assessment scales for pressure ulcers ($\rho=-0.375$; $p=0.0001$), frequency of intravenous cannula replacement ($\rho=-0.204$; $p=0.029$), frequency of patient bathing ($\rho=-0.355$; $p=0.0001$) and the method of performing nutritional evaluation of artificially fed patients ($\rho=-0.327$; $p=0.0001$). In conclusion, patient safety in the hospital should be considered a paramount issue, and nurses who spend most time with patients are expected to provide conditions for secure hospital stay, conditions for safe and quality service in the health care process, and implementation of standardized procedures based on scientific and practical evidence. Continuous reporting of quality indicators in the health care process contributes to strengthening of the organizational culture, prevention of risks and adverse events, and planning of personnel and equipment necessary for the quality of the health care process.

Key words: risks, management, nursing practice, nursing care, hospitals, adverse event

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Risk is the probability or possibility that something dangerous will happen, that there will be a loss, injury, or some other adverse consequences.
(*Oxford Dictionary*)

INTRODUCTION

Healthcare risk management began in the 1960s (USA, UK, Australia, New Zealand). It has traditionally been driven by insurance and lawsuits. Today, health risk management is widely accepted through development of appropriate standards and educational programs (1).

Risk management within the organization should be recognized as an integral part of good management, or part of organizational culture. Risk management should be included in the organization's philosophy, practices and business plans, and not treated as a separate program (2).

The main components of risk are exposure to loss or damage (action taken or not taken) – material risks, probability (uncertainty) that loss or damage will occur – non-material risks, size of loss or damage – consequences, chance to increase benefits – consequences, level of risk exposure is a combination of the probability of a risky event occurring and the consequences of that event (3).

Risks can be viewed from three angles, i.e. organizational (epidemiological approach), individual (clinical approach in the treatment of a single patient), without approach; an alternative to risk management is risky management.

Risk management in the context of health care includes clinical and non-clinical services.

Risk is an integral part of everything we do in healthcare and medicine and cannot be 100% eliminated. Healthcare professionals manage risk consciously or unconsciously, but almost never systematically (4).

A solid risk management framework is needed at the level of each health facility. This includes development of strategies and other quality documents that prevent risks and minimize them. Risk can be managed by assessing all possible risks in all organizational units based on the probability, type and severity of consequences, which enables the management of both threats and opportunities. Some risks can be completely eliminated, and some can only be reduced. Financial mechanisms can be established to absorb the financial consequences of the remaining risks (residual risk) (5).

The risks in the clinical health care process are numerous. However, their management depends on the quality and skilled team of nurses who, within the scope of their practice, perform preventive actions towards risk factors that can lead to an adverse event or incident. Nurses are actively involved in the entire healthcare team, patients and family in the treatment and care process, which contributes to joint investment in the prevention of harm and the possible consequences of care.

In the health care process, there are five key elements of the risk management process, i.e. identification, assessment, control, financing and monitoring (6).

The most common risks that are monitored in the process of clinical care are as follows: fall of the patient, pressure ulcers, inadequate communication, inadequate medication administration, and risks of nosocomial infections (7,8).

In order to reduce the possible risks in the health care process, it is necessary to implement a system of quality and safety of health services. Introduction of a quality system into the health care process enables nurses to be continuously educated, to improve performance of their work tasks, to bring new guidelines based on evidence and good clinical practice as a team member, and to standardize all work tasks (9,10).

Standardization is a path to reduce risk in clinical health care. It enables nurses/medical technicians to harmonize the work activities they provide to patients, and serves as legal and professional protection.

Standardized documents on quality that define work tasks in the health care process are guides that appropriately manage work tasks and reduce the potential risk (11).

Within the construction of the risk management system in health care, it is necessary to establish a strategy that defines the following goals:

- Providing safer health services, based on policies and practices that take into account the potential risk.
- Protecting health care users by preventing the occurrence of adverse events (incidental situations), and ensuring that, when an adverse event occurs, steps are taken to address it with minimal adverse consequences.
- Establish and develop a clear and effective structure for managing clinical and non-clinical risks.
- Providing knowledge by each employee of his/her responsibilities in risk management and acceptance of these responsibilities within work activities.
- Using risk management processes to learn from one's own mistakes, as well as planning quality improvements to ensure the best possible health care.
- Further development of organizational security culture (12).

GOALS

1. Identify the most common risks reported in the healthcare process.
2. Examine the ways and models of risk prevention in the healthcare process in hospitals.
3. Examine the practice and attitude of nurses in the process of managing risks and adverse events

METHODS

The research was conducted among nurses/medical technicians by the method of random selection in se-

veral geographical areas of Bosnia and Herzegovina, i.e. Sarajevo, Mostar, Travnik, Tuzla and Zenica.

A total of 115 respondents participated in the study. Nurses listed the Sarajevo University Clinical Center as their place of employment in 29 (25.2%) cases, followed by respondents from the Travnik General Hospital in 25 (21.8%) and Tuzla University Clinical Center in 21 (18.3%) cases. An equal number of respondents (n=20, 17.4% each) answered the questionnaire from Dr. Safet Mujić Regional Medical Center in Mostar and Zenica General Hospital. The research was conducted in the period from September 1, 2019 to November 30, 2019.

The original questionnaire prepared by the authors in the Google forms was used in the research; it was available to the respondents *via* personal e-mail invitation, and they answered it completely independently without the influence of another person. The research was descriptive.

RESULTS

The sample included 36 (31.3%) male and 79 (68.7%) female nurses. The majority of nurses were in the 40-45 age group (n=45, 39.1%), followed by 30-35 (n=20, 17.4%), 35-40 (n=18, 15.7%), 50-55 (n=14, 12.2%), 25-30 (n=10, 8.7%) and 55-60 age groups (n=8, 7.0%). According to work experience, the majority of respondents had worked for 21-30 years (n=50, 43.5%), followed by the respondents having worked for 11-20 years (n=38, 33.0%), those having worked for more than 30 years (n=15, 13.0%) and those having worked for up to 10 years (n=12, 10.4%). According to the level of education, the majority of the respondents had graduated high school (n=73, 63.5%), followed by the respondents who had finished faculty (n=27, 23.5%) and college (n=15, 13.0%). Analysis of the position and function performing at the workplace revealed that the majority of respondents were ward nurses (n=79, 68.7%), followed by head nurses at the department (n=32, 27.8%) and head nurses of the institutions (n=4, 3.5%).

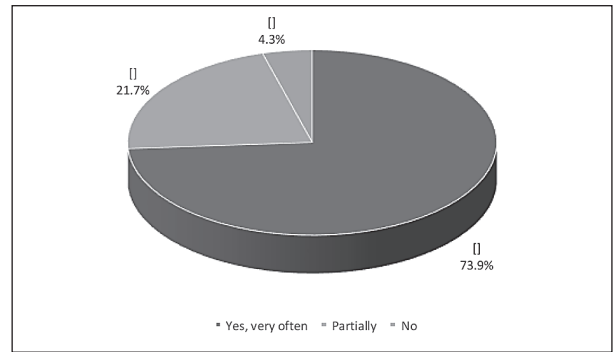


Fig. 1. Risk management in everyday practice.

It is evident that the largest number of respondents were very often able to timely prevent risk situations in 85 (73.9%) cases. They were partially successful in prevention in 25 (21.7%) cases, while it was not able to prevent the occurrence of a risk situation on time in only 5 (4.3%) cases. Accordingly, it can be concluded that risk management in the examined sample of health care institutions was good, if not excellent (73.9% of successful prevention).

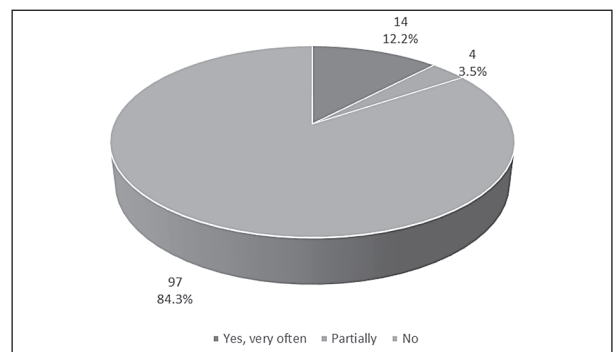


Fig. 2. Adverse events in practice.

Analysis of the occurrence of adverse events *per* patient in the past showed that it occurred as an absolute event in 14 (12.2%) cases, while partial adverse events were recorded in 4 (3.5%) cases. Harm for the patient from an adverse event was not reported in 97 (84.3%) cases. Thus, it can be concluded that risk management worked well in the institutions investigated because adverse events occurred in 15.7% of cases.

Adoption of the policies and procedures emphasizing risks in the health care process did not show to have a significant impact on the prevention of risk situations ($\chi^2=2.306$; $p=0.680$; $\rho=-0.134$; $p=0.155$), although those who had adopted the procedures were more likely to report successful prevention of risky situations.

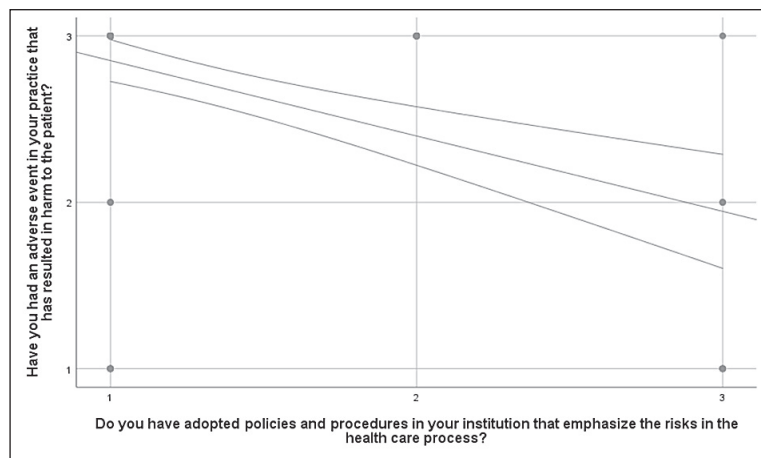


Fig. 3. Correlation of adoption of policies and procedures with reduction of adverse consequences for patient.

Legend: Adverse events for patient: 1 - yes; 2 - partially, 3 - no; Policies and procedures: 1 - yes; 2 - partially, 3 - no.

Policies and procedures showed a statistically significant effect ($\chi^2=41.069$; $p=0.0001$; $\rho=-0.408$; $p=0.0001$) on the reduction of adverse events that had harmful consequences for the patient. Analysis according to age showed that older respondents had more risk situations that they prevented on time ($\chi^2=24.469$; $p=0.006$; $\rho=-0.274$; $p=0.003$), as confirmed by the statistically significant correlation analysis, which indicated the number of risk situations prevented to have increased with advancing age of the respondents ($p<0.05$). This result was expected given that older respondents also had more work experience during which they had encountered risky situations.

On the other hand, analysis of the impact of the length of service on the number of adverse events did not show a statistically significant correlation ($\chi^2=4.178$; $p=0.653$; $\rho=-0.140$; $p=0.134$).

Education did not show an impact on the frequency of prevented risk situations ($\chi^2=4.309$; $p=0.366$; $\rho=-0.038$; $p=0.689$). However, education did influence the reduction of adverse events that resulted in harm to the patient, i.e. respondents with college and higher education more often cited these types of events in their practice ($\chi^2=9.540$; $p=0.049$; $\rho=-0.198$; $p=0.034$) $p<0.05$.

Categorization of patients showed a statistically significant impact on the occurrence of adverse events in patients, i.e. these events were less common in case of its implementation ($\chi^2=15.448$; $p=0.004$; $\rho=-0.289$; $p=0.002$).

The frequency of patient skin and mucous membrane examination during hospital stay had a significant

impact on lower number of adverse events that resulted in harm to patient ($\chi^2=14.309$; $p=0.074$; $\rho=-0.200$; $p=0.032$).

Respondents who used scales to assess the risk of fall in the highest percentage stated that they used Morse scale ($n=101$, 87.8%), whereas one (0.9%) respondent reported using Stratify scale. The analysis indicated that the type of scale used did not influence prevention of risk situations ($\chi^2=3.029$; $p=0.220$; $\rho=0.159$; $p=0.083$) and frequency of adverse events with adverse consequences ($\chi^2=0.187$; $p=0.911$; $\rho=0.039$; $p=0.678$).

The use of risk assessment scales for pressure ulcers did not show a statistically significant impact on the prevention of risk situations ($\chi^2=4.071$; $p=0.396$; $\rho=-0.149$; $p=0.112$).

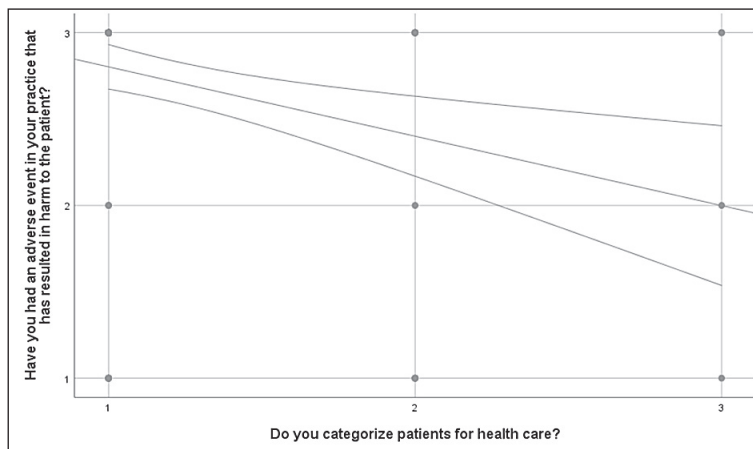


Figure 4. Correlation of patient categorization and adverse events for patient.

Legend: Adverse events for patient: 1 - yes; 2 - partially, 3 - no; Categorization: 1 - yes; 2 - partially, 3 - no.

The frequency of intravenous cannula exchanges in patients receiving intravenous medications did not show a statistically significant effect on the prevention of risk situations ($\chi^2=7.024$; $p=0.135$; $\rho=-0.164$; $p=0.080$). Yet, the frequency of intravenous cannula exchange had an effect of reducing adverse events ($\chi^2=9.828$; $p=0.043$; $\rho=-0.204$; $p=0.029$).

Monitoring of daily food intake in patients fed artificially showed a significant impact on the prevention of risk situations ($\chi^2=9.832$; $p=0.043$; $\rho=0.208$; $p=0.026$). This result should be taken with caution given the small number of respondents (only one) who answered that they did not monitor daily food intake.

DISCUSSION

Adverse events can occur even in the ideal working conditions. They also often occur in patients who are not assessed as being at risk and where we do not expect adverse events. They prolong hospital stay and increase the cost of treatment, often cause physical pain, and worsen mental health and quality of life of patients. It is necessary to perform all preventive procedures in order to reduce the risk of an adverse event to minimum and to record everything that has been done (8, 13).

The nurse has always been an advocate for the rights of the patient and it is she/he who takes care to provide the patient with appropriate care. Patient safety is the basis of quality health care and quality of care. Ensuring quality health care requires daily effort to provide a service according to professional standards and to approach each patient individually. Our study has shown that risk management in clinical health care is very important and that most respondents use all mechanisms to prevent this risk (14).

Most of the respondents stated that in their practice they carried out categorization of patients for health care and use scales to assess falls and pressure ulcers. The respondents stated that they used Morse scale to assess patient fall, and Norton and Braden scales for pressure ulcers. The largest number of respondents performed assessment using risk assessment scales (n=65, 56.5%), followed by examination of the patient including general inspection and direct inspection (n=48, 41.7%), whereas only two (1.7%) respondents did not perform risk assessment.

The way the nurses perform risk assessment in health care did not show a statistically significant impact on the prevention of risk situations or the occurrence of adverse events that have detrimental consequences for the patient.

A study on patient safety in the hospital conducted at the Šibenik General Hospital in 2015 included 90 nurses/medical technicians. A survey questionnaire was used for the research, and the results obtained indicated that the largest number of nurses rated patient safety at their work place with a very high grade (very good and excellent). The responses received from the surveyed nurses largely contained very satisfactory results in terms of adherence to protocols, availability of information, reporting of possible errors, as well as discussions on their prevention. When it comes to the quality of health care, and thus patient safety, pressure ulcers and patient decline are monitored.

Retrospective analysis of data obtained in the study

conducted at Dubrovnik General Hospital from January 1, 2016 to December 31, 2016 confirmed the use of Braden scale, which estimates the risk of pressure ulcers, and which is recorded in the patient categorization program and in the pressure ulcer program. The results obtained by the research indicate that an adverse event in the health care process was pressure ulcer with a higher incidence in men as compared with women (61% vs. 39%). Analysis of data related to decline as an adverse event in the health care process and related to the method of admission, the frequency was slightly higher in patients admitted as an emergency than in those admitted through elective admissions (57.69% vs. 42.3%) (15).

The research conducted by Ovčina *et al.* at the Sarajevo University Clinical Center (SUCC) in the period from January 1, 2016 until December 31, 2018 showed the prevalence of nosocomial infections in hospitalized patients to have decreased following the study period. The regularity of registration in SUCC is 90%. The highest prevalence of isolates was, as expected, in the intensive care unit of the Department of Anesthesia and Resuscitation, where *Acinetobacter baumannii* significantly predominated in 2016. With the introduction of standardized quality documents, guidelines and algorithms for the prevention of nosocomial infections, this number decreased during 2017 by 60%, which is a special indicator of the quality of health services. Guidelines are based on scientific evidence and good medical practice have been introduced in the hospital. Good results were achieved by performing oral hygiene at least 2 times a day, placing the patient in a semi-sitting position, regular daily bathing with an iodine brush for surgical hand washing (10% iodine solution), and surveillance of clinical nutrition.

In 2016, 38 falls of patients were reported in SUCC, which did not result in permanent harm to the patient. Analysis of the incidents identified the risks of fall in the hospital and active steps were taken to prevent falls. Working groups in cooperation with the Department of Quality and Safety of Health Services created standardized quality documents that assess the risk of falls, improved the environment in patient rooms and strengthened supervision. In this way, the number of falls was reduced by 10 in 2017, in 2018 the total number of falls was 19, whereas in 2019 falls were recorded in 34 patients. Analysis of the reported falls showed that they occurred in less mobile patients, due to poor assessment by the patient him/herself, after getting out of bed, when going to the toilet, etc.

During the 2016-2019 period, the number of reported pressure ulcers in hospitalized patients was not worrying, if we look at the low rate of patients with confirmed pressure ulcers of 0.3% in 2016, with a si-

gnificant downward trend in 2017 and 2018 (0.03% and 0.08%, respectively), whereas in 2019 the rate was 0.25%-0.3%. Since a significant number of admitted patients requiring progressive health care was recorded and there was an insufficient number of workers in the health care process, the number of reported pressure ulcers in the hospital was rather small, i.e. 3 in 2016, 2 in 2017, 6 in 2018 and 14 in 2019. Generally, there was a significant number of pressure ulcers in patients hospitalized from home care or nursing homes. Pressure ulcers were most often recorded at Department of Neurology, Department of Cardiovascular Diseases and Rheumatism, and Department of Anesthesia and Resuscitation, Intensive Care and Therapy (16).

A study conducted by Hodak in 2016 at Osijek University Hospital Centre, which included opinions of 100 nurses/medical technicians on adverse events including pressure ulcers, declining patients, nosocomial infections, poor hand hygiene, and adverse drug side effects showed that nurses/medical technicians were active in improving safety culture (82%) and rated it as acceptable (57.1%). The results showed that highly educated nurses/medical technicians and bachelors were more likely to report adverse events (45.9%) and worked longer to provide the patient with the best care (61.7%). Nurses/medical technicians were active in improving the culture of patient safety (82%) and assessed it as acceptable (57.1%). Nurses/medical technicians agreed that they did not have enough staff to work, and only 50% of respondents agreed that the system was good in preventing adverse events. Most respondents (74.2%) felt reporting of an adverse event as a personal report rather than an event report as a difficulty in work. The majority of respondents agreed that they helped each other (86%) and treated each other with respect (47%). Only 40% of respondents agreed with the statement that hospital administration promoted the culture of patient safety (17).

A similar study was conducted in California in 232 acute hospitals. The study included adverse events including patient fall/injury, pressure ulcers, adverse drug side effects, and nosocomial infections. A multi-level analysis investigated the impact of nurses and patients and hospital characteristics on patient care outcomes. The results showed that patients experienced adverse events during hospital stay, necessitating reduction in adverse events in the health care system. Having appropriate nursing care was crucial in the context of some cases (18).

CONCLUSIONS

1. Results of our study indicate that risk management in everyday nursing clinical practice contributes

to strengthening the organizational culture, which shows a significant impact of adopted policies and procedures on reducing the number of risk events.

2. The use of clinical scales and tests reduces the risk of adverse events in practice as shown by the reduction in the number of risk events in cases of using patient categorization, use of fall risk assessment scales and pressure ulcer risk assessment scales.
3. Reporting of adverse events in practice is related to the establishment of standardized quality documents that prevent events and possible errors as shown in this study with the use of scales for risk assessment and categorization of patients in relation to the need for health care.

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SAŽETAK

MENADŽMENT RIZIKA U PROCESU KLINIČKE ZDRAVSTVENE NJEGE

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Upravljanje rizicima u procesu sestrinske kliničke prakse je sistematičan proces koji zahtijeva stručnost i vještine u prevenciji nastanka rizika. Sigurnost bolesnika u bolnici je primarni cilj svakog pojedinca koji pruža zdravstvenu uslugu, a istodobno i same organizacije. U skladu s time neophodno je razviti strategije kojima će rizici u bolnici biti svedeni na minimum i kojima će se uspješno riješiti neželjeni događaji u praksi. Glavna hipoteza rada bila je da upravljanje rizicima u procesu zdravstvene njege ima pozitivan utjecaj na kvalitetu i sigurnost zdravstvenih usluga. Ciljevi rada bili su: 1. Utvrditi najčešće rizike koji se prijavljuju u procesu zdravstvene njege; 2. Ispitati načine i modele prevencije rizika u procesu zdravstvene njege u bolnicama; 3. Ispitati praksu i stav medicinskih sestara u procesu upravljanja rizicima i neželjenim događajima. Istraživanje je provedeno među 115 medicinskih sestara-tehničara zaposlenih u javnim zdravstvenim ustanovama, bolnicama u FBiH. U istraživanju je primijenjen originalni autorski anketni upitnik pripremljen u elektroničkom programu Google forms koji je ispitanicima bio dostupan putem osobne adrese e-pošte, a na njega su odgovarali potpuno samostalno bez utjecaja druge osobe. Usporedba rizičnih događaja u praksi pokazuje statistički značajno smanjenje u odnosu na stariju dob ispitanika ($\rho = -0,274$; $p = 0,003$), duži radni staž ispitanika ($\rho = -0,334$; $p = 0,0001$), višu stručnu spremu ispitanika ($\rho = -0,198$; $p = 0,034$), provođenje kategorizacije bolesnika ($\rho = -0,289$; $p = 0,002$), usvojene politike i postupke ($\rho = -0,408$; $p = 0,0001$). Na smanjenje broja neželjenih događaja za bolesnika statistički značajan utjecaj pokazali su: učestalost pregleda kože i sluznica bolesnika za vrijeme hospitalizacije ($\rho = -0,200$; $p = 0,032$), uporaba ljestvica za procjenu rizika od pada ($\rho = -0,422$; $p = 0,0001$), uporaba ljestvica za procjenu rizika za nastanak dekubitusa ($\rho = -0,375$; $p = 0,0001$), učestalost promjene intravenske kanile ($\rho = -0,204$; $p = 0,029$), učestalost kupanja bolesnika ($\rho = -0,355$; $p = 0,0001$) i način nutritivne procjene bolesnika koji se hrane umjetnim putem ($\rho = -0,327$; $p = 0,0001$). U zaključku, sigurnost bolesnika u bolnici treba biti na prvom mjestu, a od medicinskih sestara koje najviše vremena provode uz bolesnike očekuje se osiguranje uvjeta za siguran smještaj u bolničkom prostoru, uvjeta za sigurnu i kvalitetnu uslugu u procesu zdravstvene njege te primjenu standardiziranih postupaka osnovanih na znanstvenim dokazima i dokazima iz prakse. Kontinuirano izvještavanje o indikatorima kvalitete u procesu zdravstvene njege doprinosi jačanju organizacijske kulture, prevenciji rizika i neželjenih događaja te planiranju kadrova i opreme neophodne za kvalitetu procesa zdravstvene njege.

Ključne riječi: rizici, upravljanje, sestrinska praksa, zdravstvena njega, bolnice, neželjeni događaji