University of Applied Health Sciences Croatian Nursing Council







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EDITORIAL Snježana Čukljek EDITOR-IN-CHIEF



I am honoured to present the first issue of the *Croatian Nursing Journal* on behalf of the Editorial Board. The *Croatian Nursing Journal* is a peer-reviewed nursing journal that publishes original articles with the aim of advancing and exchanging knowledge and experience, and also enables readers to be informed about contemporary professional and research trends in the field of nursing and other health sciences. The Journal is primarily intended for nurses, but also all members of an interdisciplinary team. It enables the exchange of professional and scientific knowledge to improve patient health care as well as to encourage further development of the nursing profession.

The need for launching a scientific and professional nursing journal has long been recognized, and the realization was initiated by Krešimir Rotim, PhD, Dean of the University of Applied Health Sciences and the president of the Croatian Nursing Council, Mrs. Slava Šepec. The establishment of the Journal was also supported by the Governing and Expert Councils of the University of Applied Health Sciences and the Executive Board of the Croatian Nursing Council. I hereby thank them for their trust, support, advice and overall assistance.

The establishment of the Journal was a great challenge, but the experience, knowledge and co-operation of the deputy editor-in-chief, Editorial Board and assistant editors significantly facilitated the work and contributed to the quality of this project.

I wish to thank everyone who contributed to the establishment and publishing of the first issue: the deputy editor-in-chief, Editorial Board and Editorial Council, assistant editors, reviewers and technical editors. I also want to thank the authors who placed their trust in us and delivered their papers to make this first issue possible.

Furthermore, I wish to thank all the others who shared news on the establishment of the Journal, enabled us to present the *Croatian Nursing Journal* and encouraged their colleagues to publish their articles. I believe this is the first in a series of issues of our Journal and that these are just some of many articles we will be able to read and quote in the future, which we will discuss, and which will encourage us to conduct further professional and scientific research.

I hereby invite you to collaborate, get involved in the Journal by submitting your papers for publication, and stay up-to-date with the published articles.

EDITORIAL Krešimir Rotim DEAN OF THE UNIVERSITY OF APPLIED HEALTH SCIENCES



The University of Applied Health Sciences Zagreb is the leading higher education institution for the education of nurses and other health professionals: physiotherapists, radiological technologists, bachelors of environmental health engineering and laboratory medical diagnostics, as well as occupational therapists. This year, the University marked the 51st anniversary of its founding and 10 years of nursing specialist graduate professional study programmes. Over 20,000 students graduated from these studies, of which nearly half were nurses by completing undergraduate and graduate studies.

Graduates from the University of Applied Health Sciences are caregivers in the health care system and are recognized for their acquired knowledge and competences for performing high-responsibility tasks. Therefore, the interest for enrolment in the University studies is extremely high and the University has been one of the most popular higher education institutions for years. The students of the University are recognized for their excellence during their studies. As many as 55 students received a state scholarship in STEM areas in the academic year 2017/2018.

In order to ensure quality education, the University places particular emphasis on the study programme teachers and involving eminent experts from the field of health care and other areas in the programmes. The University places special attention on the development and training of its own staff so they are up-to-date and even ahead of the constant challenges of modern health care.

The development of nursing, physiotherapy, radiological technology and other professions whose professionals are educated at the University has been exceptional in the last 20 years. Along with education, the University also supports the development of professions through the promotion and development of research work. This year, the Centre for Translational and Clinical Research was established, and for years the University has had the Department for Research, Projects and Development.

In order to encourage sharing knowledge and enable the continuous education of health professionals, keeping up with current information, trends and research findings in this interdisciplinary area, the University of Applied Health Sciences launched the Journal of Applied Health Sciences in 2015, which is entering its fourth year of publication.

In recognition of the development and strength of the nursing profession in the Republic of Croatia, we decided to launch a scientific and professional journal, the *Croatian Nursing Journal*, together with the Croatian Nursing Council. Experts from the nursing sector of Croatia, as well as the wider international community, cooperated on the Journal and this is its first issue.

Nurses are dedicated to their work in everyday clinical practice. They want to acquire knowledge through formal types of education and lifelong learning. They are enthusiastic and love their profession. We believe that the *Croatian Nursing Journal* will become a means for expert and scientific discussion between nurses and other collaborators in an interdisciplinary team. Therefore, we invite you to work with us to further develop the Journal together.

EDITORIAL Slava Šepec PRESIDENT OF THE CROATIAN NURSING COUNCIL



Dear colleagues,

This is the first issue of the scientific and professional journal published as the result of the collaboration between the Croatian Nursing Council and the University of Applied Health Sciences. The purpose of this journal is to enable nurses to publish their scientific and professional papers.

Nursing seeks a scientific approach to nursing care. In this sense, the Croatian Nursing Council has produced documentation that is the basis for nursing research and encourages the development of other documents that direct nursing towards a more systematic approach to nursing care.

During their graduate and doctoral studies, nurses of the Republic of Croatia publish their papers in recent foreign and some domestic scientific journals. For their research in the field of nursing, nurses receive international awards. Evidence-based knowledge changes access to nursing care.

The importance of this journal for the Croatian Nursing Chamber lays in sharing the best discoveries in nursing and other related fields. Bearing in mind the number of published nursing papers in professional and scientific journals that are not available to the majority of nurses in Croatia, we would like to make such papers available to every nurse and nursing student.

We expect the Journal to be the link between theory and practice.

Therefore, I urge nurses to record, investigate, analyse and publish the results of their research in this journal which is important for the nursing profession.

Nurses' Opinion on Reporting of Adverse Events during the Process of Nursing Care

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Abstract

Introduction. Patient safety represents the most reliable measure of the quality of work in nursing. The most common adverse events associated with the process of nursing care are bedsores, falls, hospitalacquired infections, insufficient hand hygiene and unwanted adverse effects related to drugs.

Aim. The aim of this study was to investigate the views of respondents on adverse events during the process of nursing care in the University Hospital Centre Osijek.

Respondents and methods. A quantitative crosssectional study was conducted using an anonymous survey on a sample of 100 nurses in February and March 2016, at the clinics for surgery, internal medicine and anaesthesiology, the intensive care unit, emergency room and neurology.

Results. The study showed that nurses actively improve patient safety (82% of respondents). 71% of the nurses believe that the mistakes reflect on them, while 67.7% of the respondents agree with the claim that the mistakes led to positive changes. When an adverse event is reported, 74.2% of nurses feel as if they are the ones being reported, and not the problem itself. After they make changes to improve patient safety, 83.5% of the nurses evaluate their effectiveness. 33.4% of the respondents claim that the respondents claim that the respondents claim that the procedure and the system are efficient at preventing mistakes.

Most respondents (57.1%) rated patient safety as acceptable. In similar studies that were conducted in US hospitals, there was generally a higher level of the patient safety culture by several grade points.

Conclusion. Nurses agree that the patient safety culture regarding adverse events in the process of nursing care in the University Hospital Centre Osijek is acceptable, and that they are responsible for protecting and improving patient safety.

1. Introduction

Patient safety represents the most reliable measure of the quality of work in nursing. The World Health Organization defines patient safety as "prevention, elimination and improvement of protection against adverse events during the process of health care" (1). Adverse events occur in every medical procedure and at all levels of the health system. The most common errors in nursing are related to patient falls, administration of drugs, bedsores, insufficient hand hygiene, and hospital infections. In the most developed countries, despite the usage of modern technology, 10% to 12% of patients are exposed to incidents of which as many as half could have been prevented.

1.1. The European Council on patient safety and quality of health care

The Council of the European Union adopted the guidelines on patient safety and quality of health care in 2009. That marked the start of an improvement program in the EU Member States which states the following:

- support the establishment and development of national policies and programs for patient safety
- increase the awareness about institutions responsible for patient safety
- include patient safety as a priority in all health policies and programs
- allow reviewing and updating of patient safety standards and best practices that are carried out in the territory of Member States
- encourage health care organizations to take on an active role

- present the risks and safety measures which are applied
- learn about complaint procedures and remedies
- develop patient competencies (knowledge, skills and attitudes required for the safe use of health care)
- collect additional recommendations for infection prevention and control (2).

1.2. Croatian Agency for Quality and Accreditation in Health Care and Social Welfare

Unexpected adverse events are defined by the Regulation on Health Care Standards and the Manner of Their Application (Official Gazette 79/11), which all health institutions, companies and private health workers must follow and report on every three months to the Ministry and the Agency for Quality and Accreditation in Health Care and Social Welfare. A report of other adverse events should be submitted every six months (3). Unexpected adverse events are:

- a surgical procedure performed on the wrong patient
- a surgical procedure performed on the wrong body part
- an instrument or object left on the site of a surgical procedure due to which additional surgery or procedure must be performed
- a transfusion reaction due to ABO incompatibility
- death, coma or severe damage to health due to incorrect pharmacotherapy
- death of a mother or a serious illness associated with childbirth
- kidnapping of a newborn
- discharging a newborn to a wrong family
- death or a permanent disability of a healthy newborn, whose birth weight is greater than 2500 g, which are not associated with a congenital disease
- severe neonatal jaundice (bilirubin > 513 µmol/L)
- suicide or attempted suicide in a medical institution or a company, or within 72 hours of patient discharge
- wrong body region radiotherapy
- radiotherapy with a dose of 25% above the planned one.

Other adverse events (patient safety indicators):

- standardised hospital mortality rate
- postoperative wound infection
- insufficient hand hygiene
- postoperative pulmonary embolism or deep vein thrombosis
- postoperative bleeding or hematoma
- adverse drug side effects
- obstetric trauma vaginal delivery without instruments
- birth trauma injury of a newborn
- postoperative hip fracture
- fall in a medical institution
- decubital ulcer
- side effects of antipsychotic treatment.

The Agency for Quality and Accreditation in Health Care and Social Welfare has established data collection on adverse events in health care institutions via the IZ-AAZ-NND form which is on the Agency's website. The data gathered on unexpected adverse events have been analysed since 2012.

1.3. Croatian Act on Quality of Health Care

Article 5 of the Act on Quality of Health Care (Official Gazette 107/07) states the following regarding the safety of patients and staff: "A health institution, a company or a private health worker must have ways of identification and detection of the prevalence and severity of incidents that affect or threaten the safety of patients and staff. This must include medical errors and adverse events" (4). Health institutions, companies and private health workers must have a documented system of patient and staff safety which should include the following: detection and reporting, preventive and corrective actions, a defined procedure for risk reduction, implementation of action plans, continuous monitoring to ensure the effectiveness of actions, the assessment of the safety of patients and staff carried out by the head or the responsible person, the policy and practice of informing patients and/ or their families about unexpected adverse events (4).

1.4. Croatian Society for Patient Safety

The Society's main goal is to improve patient safety by researching and reviewing the current level of patient safety, continuously improving the patient safety culture by ensuring the availability of all methods and tools for improving patient safety and encouraging the application of these tools and methods at all levels of health care and social welfare.

The Society's main goals include the following activities:

- promotion of the importance of patient safety by organizing educational, professional and public meetings
- regular collection of the latest, complete and high-quality information on methods and tools for improving patient safety and their presentation to the members of the Society and the general public in order to improve the exchange of information
- supporting experts and people involved in improving patient safety, especially young people, by organizing lectures, courses, seminars and workshops

1.5. Society for Quality -Croatian Nurses Association

In 2015, the Society for Quality – Croatian Nurses Association organised a conference aimed at keeping and analysing previously obtained nursing documentation. The data on risks associated with the falls, bedsores and nosocomial infections, the measures taken and the improvements that emerged on the basis of those analyses was obtained from different medical institutions. The number of units for quality has been increasing in hospitals and nurses are integral, equal members. So, there are nurses for education, nosocomial infections and a nurse for discharging patients from the hospital (5).

1.6. Creating a patient safety culture

The American Nurses Association (ANA) defines safety culture as one in which the fundamental values and conduct are a result of a collective and continuous involvement of organizational leadership and workers in emphasizing safety over competing objectives (6). The characteristics of a positive safety culture are openness and mutual trust when discussing safety issues and solutions without blaming the individual. Confident staff and different levels of skills in the learning environment in which health professionals can learn from the mistakes and actively reveal systemic weaknesses contribute to transparency and accountability (6). Nurses have an ethical obligation to prevent and deal with adverse events. Ethical theories are the basis of this view and suggest discovering mistakes in patient treatment (7).

1.7. Adverse events associated with the process of nursing care

The most common adverse events associated with the process of nursing care are bedsores, patient falls, nosocomial infections, insufficient hand hygiene and unwanted drug side effects. We will go into more detail later on in the paper.

1.7.1. Bedsores

In 2009, the European and US National Pressure UIcer Advisory panels (EPUAP and NPUAP) announced first clinical guidelines for the prevention and treatment of bedsores aimed at improving care of patients with bedsores in all EU countries and the world. NP-UAP brought a consensus on a common methodology for monitoring in 1989. Bedsore frequency varies from 1% to 11%, while the prevalence in hospitalised population is from 5% to 15%, 39% in chronic patients, from 3% to 20% in institutions for elderly people, and around 20% in home care (8). The declaration on the prevention of bedsores as a universal human right was adopted in Rio de Janeiro in November 2011. It describes bedsores as an adverse event and a main threat to patient safety within the health system of any institution and any country in the world.

1.7.2. Patient falls in a medical institution

Monitoring the rate of patient falls and the application of indicators of quality health care as well as a planned and systematic introduction of changes in the work process ensure safe and efficient health services and significantly reduce the possibility of occurrence of adverse events (9). The Morse Fall Scale is used most often, but other tools can be used which are adapted to patients' needs and specifics of a health institution. Nurses and other health workers should have clear guidelines on the methods of reporting the adverse events and the time frame in which the adverse event should be reported.

1.7.3. Nosocomial infections

It is estimated that around 4.1 million patients contract an infection associated with health care every year in the European Union (10). A direct result of these infections is about 37,000 deaths, with additional 110,000 deaths caused by indirect effects (10). By increasing mortality and permanent damages, those infections prolong hospitalization and increase costs. The infection associated with health care is every patient infection that occurs independently of the primary disease, i.e. it is any infection of a healthy person which is the result of diagnosis, treatment or nursing care, which developed during treatment and nursing care, after a diagnostic or therapeutic procedure, or after discharge from the hospital or other health care institution (10). In developed countries' health institutions, 5% to 10% of patients in hospitals get one or more hospital infections. In the intensive care units, a portion of patients affected by hospital infections is up to 30% (10).

1.7.4. Insufficient hand hygiene

The World Health Organization announced actions that are based on scientific evidence regarding hand hygiene in health care to support health institutions in improving hand hygiene and thus reduce infections associated with health care. Although hand hygiene is considered the single most important intervention in the prevention of nosocomial infections, research shows poor compliance of health care professionals (10). It is a complex problem which involves elements of lack of motivation and ignorance about the importance of hand hygiene. This may be due to a lack of personnel, unavailability of resources for hand hygiene and unacceptable agents for hand hygiene.

1.7.5. Adverse side effects of drugs

A side effect of a drug is any harmful and unwanted reaction to a medicine which is properly administrated in therapeutic doses in the approved indication (11). A serious drug side effect/adverse event is any harmful and undesirable sign, symptom or disease associated with the time of the drug administration, and which does not have to be consequentially related to the drug administration. Side effects include the death of a person, a life-threatening condition, the need for hospitalization or prolongation of current hospitalization, a permanent or severe disability or a disability, congenital anomaly/birth defect and other medically important conditions estimated by the applicant (11). Error in the drug administration in the process of nursing care is when a drug is administration.

istered to the wrong patient, in the wrong dosage, at the wrong time or by wrong application.

1.8. Measures important for the prevention of adverse events in the nursing practice

The patient is at the heart of the quality system. Therefore, the health institution and its employees must ensure conditions which contribute to their health and safety. Measures for the prevention of adverse events in nursing practice, with quality control of nursing care, include the following: integration and evaluation of prevention programs in relation to falls and bedsores, numerous interventions, a multidisciplinary approach, education of the staff, patients and collaboration with families, increasing awareness of nurses, data collection, trend analysis, reporting on adverse events in professional meetings as well as changes in the work environment.

1.9. Risk management in the process of nursing care

There is not enough staff in the health system to successfully implement measures regarding patient safety into everyday practice. Dedication is particularly important to incorporate the desired safety culture throughout the organisation. Quality infrastructure should be supported with human resources necessary to successfully improve the quality of nursing care. It is important that the highly educated nurses, in charge of the quality of the work, be at specific positions because they encourage changes in terms of improving health care quality, patient safety and risk management in the quality system (12).

2. Aim of the paper

The aim of this paper is to examine the opinions subjects have for reporting of adverse events during the process of nursing care in the University Hospital Centre Osijek.

3. Subjects and methods

3.1. Research structure

A quantitative cross-sectional study was conducted during February and March 2016.

3.2. Subjects

The sample consists of one hundred (100) participants - nurses of all levels of education and jobs, employed in the University Hospital Centre Osijek at the Departments of Surgery, Anaesthesia and Intensive Care, Internal Medicine, Neurology and Maxillofacial Surgery. Each participant was familiar with the purpose of the research and gave voluntary consent to participate. Confidentiality of the information was ensured by using sealed envelopes. The criteria for the inclusion into the research was the vocation of a nurse, regardless of the level of education completed. None of the subjects were excluded during the study nor were there any subsequently included subjects. The method of choosing the nurses sample for the research was random.

3.3. Methods

The survey instrument was an anonymous Likert poll for surveying on a scale from 1 to 5. The survey was partly based on a survey which was systematically used for research on the patient safety culture in US hospitals. It consisted of ten parts regarding the working environment (17 questions), the supervisor (4 questions), communication (6 questions), the frequency of reporting of adverse events in the department (2 questions), the assessment of patient safety (1 question), the patient safety culture in the hospital (3 questions), the frequency of reporting of adverse events in the last 12 months (1 question), general information about the subjects and comments on subjects related to adverse events that existed in their work environment.

3.3.1. Statistical methods

Normality of the distribution was tested by the Kolmogorov-Smirnov test. Mean values of the continuous variables are expressed with median and interquartile range, and nominal indicators are expressed with an absolute and relative number. Differences between categorical variables were tested by the Fisher's exact test. The Mann-Whitney test was used to determine the difference between two independent groups. Originally written applications for the databases were used, and the SPSS statistical package for Windows (version 17.0, Carry, NY, USA) with significance level α = 0.05. All P values are two-sided.

4. Results

4.1. Subjects' characteristics

The study was conducted on 100 subjects, of which 19% have been working in a hospital for less than a year, 29% of them for one to ten years, and 52% of them have been working for 11 to 20 years. 31% of subjects hold a Bachelor of Nursing degree, 62% of subjects are nurses who completed a secondary education, and 7% of the subjects have a Master of Nurs-

ing degree. The same percentage of subjects – 50% are from surgical (surgery and ICU, anaesthesiology) and non-surgical departments (internal medicine and neurology).

4.2. Workplace

60 subjects (61.2%) agree with the claim that people support each other, and 86 subjects (86%) state that they work as a team when there is a lot of work needed to be done quickly. 52 subjects (52%) agree with the claim that people treat each other with respect, and 61 subjects (61%) work longer than they have to in order to provide the best care to the patient. There are no significant differences in the self-evaluated claims regarding the workplace, inter-human relationships and working in a team by years of work experience (Table 1) or by education level (Table 2).

80 subjects (82%) agree that nurses are active in improving patient safety, and 18 subjects (18.5%) say that they use substitute nurses which is the best for patient care. 71 (71%) of nurses feel that mistakes reflect on them, and 65 subjects (67.7%) agree with the claim that mistakes led to positive improvements. 72 subjects (72.7%) agree that serious mistakes do not happen and that it is all just a coincidence, and 70 subjects (72.1%) state that another ward helps out if



Figure 1. Subjects by their workplace

| Table 1. Mean value of self-evaluation claims regarding the workplace by years of work experience | | | | | | | |
|---|---|-----------------|------------------|--------------|-------|--|--|
| | Median (Interquartile range) by the amount of work experience | | | | | | |
| | < 1 year | 1 - 10 years | 11 - 20 years | Total | P | | |
| People support each other in this ward. | 4 (2 - 4) | 4 (2 - 4) | 4 (2 - 4) | 4 (2 - 4) | 0.636 | | |
| We have enough staff. | 2 (1 - 3) | 2 (1 - 3) | 2 (1 - 2) | 2 (1 - 2) | 0.546 | | |
| We work together as a team when there is a lot of work that needs to be done. | 4 (4 - 4) | 4 (4 - 4) | 4 (4 - 4) | 4 (4 - 4) | 0.839 | | |
| People treat each other with respect. | 3 (2 - 4) | 4 (2 - 4) | 4 (2 - 4) | 4 (2 - 4) | 0.820 | | |
| Ward staff works longer than it is necessary to provide the best care to the patient. | 4 (2 - 4) | 3 (2 - 4) | 4 (3 - 4) | 4 (2 - 4) | 0.317 | | |
| *Kruckal Mallis tost | | | | | | | |

Table 2. Mean value of self-evaluation claims regarding the workplace by education level

| Median (Interquartile range) by education level | | | | | |
|--|---|-----------------|--------------|------------|--|
| | Bachelor or Master of Nursing degree | Nurse | Total | P * | |
| People support each other in this ward. | 4 (2 - 4) | 4 (2 - 4) | 4 (2 - 4) | 0.642 | |
| We have enough staff. | 2 (1 - 2) | 2 (1 - 2.25) | 2 (1 - 2) | 0.876 | |
| We work together as a team when there is a lot of work that needs to be done. | 4 (4 - 4.25) | 4 (4 - 4) | 4 (4 - 4) | 0.087 | |
| People treat each other with respect. | 3.5 (2 - 4) | 4 (2 - 4) | 4 (2 - 4) | 0.542 | |
| Ward staff works longer than it is necessary to provide the best care to the patient. | 4 (2 - 4) | 4 (2.5 - 4) | 4 (2 - 4) | 0.667 | |
| SAME A REPORT OF A | | | | | |

a ward is really busy. If the adverse event is reported, 72 subjects (74.2%) feel like they are the ones that are reported, and not the event. After changes to improve patient safety, 81 subjects (83.5%) assess their efficiency. Significantly more subjects, who have more than one year of work experience, agree with the claim that another ward helps out when a ward is busy, compared to subjects who only have a maximum of one year of work experience (Kruskal-Wallis test, p=0.013) (Table 3). Subjects holding a Bachelor or Master of Nursing degree feel that the report of the adverse event is more a rebuke of them than a report of the event (Mann-Whitney U test, p = 0.032) (Table 4).

4.3. Superior

72 subjects (72.7%) state that the superior commends them when he/she sees that the work is carried out in accordance with the established procedures of patient safety, and 81 subjects (81.8%) agree with the statement that the superior seriously considers proposals from their colleagues to improve patient safety. 55 subjects (56.1%) agree that their superior wants the job to be done quicker in high stress situations, even if it means shortening the procedure. Subjects holding a Bachelor or Master of Nursing degree agree significantly more with the statement that when the stress increases the supe-

| Table 3. Mean values of self-assessment of safety in the workplace, workload and mistakes that occur by years of work experience | | | | | | |
|---|----------------|-------------------|------------------|----------------|-------|--|
| | Median (Interq | uartile range) by | the amount of wo | rk experience | | |
| | < 1 year | 1 - 10 years | 11 - 20years | Total | h | |
| Nurses are active in improving patient safety. | 4 (4 - 4) | 4 (3 - 4) | 4 (4 - 4) | 4 (4 - 4) | 0.216 | |
| We use substitute nurses which is the best for patient care. | 2 (1 - 3) | 2 (1 - 3) | 2 (1 - 4) | 2 (1 - 3) | 0.918 | |
| Nurses feel that mistakes reflect on them. | 3 (3 - 4) | 4 (3.5 - 4) | 4 (4 - 4) | 4 (3 - 4) | 0.059 | |
| Mistakes have led to positive changes. | 4 (3 - 4) | 4 (3 - 4) | 4 (3 - 4) | 4 (3 - 4) | 0.452 | |
| It is just a coincidence. Serious mistakes do not happen here. | 4 (2 - 4) | 4 (3.25 - 5) | 4 (4 - 4) | 4 (3 - 4) | 0.146 | |
| When one hospital ward is truly busy, the other ward helps out. | 3 (2 - 4) | 4 (2 - 4) | 4 (4 - 4) | 4 (3 - 4) | 0.013 | |
| When an adverse event would get reported, nurses felt like they were the ones that got reported, and not the problem. | 4 (3 - 4) | 4 (4 - 4) | 4 (3 - 4) | 4 (3 - 4) | 0.708 | |
| Once you make changes to improve the safety of patients, you evaluate their effectiveness. | 4 (3 - 4) | 4 (4 - 4) | 4 (4 - 4) | 4 (4 - 4) | 0.980 | |
| We are trying to do too much and too fast. | 4 (3 - 4) | 4 (4 - 4) | 4 (3.75 - 4) | 4 (4 - 4) | 0.172 | |
| We sacrificed patient safety in order to complete more work. | 4 (2 - 4) | 3 (2 - 4) | 2 (2 - 4) | 3 (2 - 4) | 0.235 | |
| We have a patient safety problem in this ward. | 3 (3 - 4) | 3 (2 - 4) | 2 (2 - 4) | 3 (2 - 4) | 0.177 | |
| Our actions and system are good at preventing mistakes. | 3 (2 - 4) | 3 (2 - 4) | 4 (3 - 4) | 3,5 (2 - 4) | 0.418 | |
| *Kruskal-Wallis test | | | | | | |

rior wants the job to be done faster, even if it means shortening the procedure (Mann-Whitney U test, p = 0.021) (Table 5).

4.4. Communication

41 subjects (41.8%) agree with the claim that feedback is given regarding the changes on the basis of a report of an adverse event, and 79 subjects (79.8%) agree with the claim that nurses speak freely if they notice something that may negatively impact patient care. 50 subjects (49.5%) agree with the claim that they are informed about the mistakes which occur in the ward, and 53 subjects (53.6%) agree with the claim that nurses can freely ask about the superior's decisions. 72 subjects (72.7%) agree with the claim that they can talk about the ways to prevent mistakes in the hospital, and 10 subjects (10.1%) state that nurses are afraid to ask for advice when they are not doing things according to the procedure (Table 6).

4.5. The frequency of adverse events reported in the hospital

45 subjects (45.9%) state that they, usually or always, report mistakes which directly affect the patient, and 38 subjects (39.6%) state that they, usually or always, report mistakes which cannot potentially harm the patient (Table 7).

| Table 4. Mean values of self-assessment of safety in the workplace, workload and mistakes that occur by education level | | | | | | |
|---|--|-----------------|----------------|------------|--|--|
| | Median (Interquart | ile range) by e | ducation level | | | |
| | Bachelor or Master of Nursing degree | Nurse | Total | P * | | |
| Nurses are active in improving patient safety. | 4 (3 - 4) | 4 (4 - 4) | 4 (4 - 4) | 0.689 | | |
| We use substitute nurses which is the best for patient care. | 2 (1 - 2.25) | 2 (1 - 3) | 2 (1 - 3) | 0.597 | | |
| Nurses feel that mistakes reflect on them. | 4 (4 - 4) | 4 (3 - 4) | 4 (3 - 4) | 0.165 | | |
| Mistakes have led to positive changes. | 4 (3 - 4) | 4 (3 - 4) | 4 (3 - 4) | 0.226 | | |
| It is just a coincidence. Serious mistakes do not happen here. | 4 (3.75 - 4.25) | 4 (3 - 4) | 4 (3 - 4) | 0.431 | | |
| When one hospital ward is truly busy, the other ward helps out. | 4 (3 - 4) | 4 (3 - 4) | 4 (3 - 4) | 0.919 | | |
| When an adverse event would get reported, nurses felt like they were the ones that got reported, and not the problem. | 4 (4 - 4) | 3 (3 - 4) | 4 (3 - 4) | 0.032 | | |
| Once you make changes to improve the safety of patients, you evaluate their effectiveness. | 4 (4 - 4) | 4 (4 - 4) | 4 (4 - 4) | 0.502 | | |
| We are trying to do too much and too fast. | 4 (4 - 4) | 4 (3 - 4) | 4 (4 - 4) | 0.244 | | |
| We sacrificed patient safety in order to complete more work. | 3 (2 - 4) | 3 (2 - 4) | 3 (2 - 4) | 0.645 | | |
| We have a patient safety problem in this ward. | 2 (2 - 4) | 3 (2 - 4) | 3 (2 - 4) | 0.281 | | |
| Our actions and system are good at preventing mistakes. | 3 (2 - 4) | 4 (2 - 4) | 3.5 (2 - 4) | 0.919 | | |
| *Mann_Whitney test | | | | | | |

| Table 5. Mean values of self-evaluation of the superior's procedures by education level | | | | | | | |
|--|--|----------------|--------------|------------|--|--|--|
| Median (Interquartile range) | | | | | | | |
| My superior | Bachelor or Master of Nursing degree | Nurse | Total | p * | | | |
| commends when he/shesees that the work takes place in accordance with the established methods of patient safety. | 4 (3 - 4) | 4 (3.5 - 4) | 4 (3 - 4) | 0.887 | | | |
| seriously considers nurses' proposals for improving patient safety. | 4 (4 - 4.25) | 4 (4 - 4) | 4 (4 - 4) | 0.082 | | | |
| when stress increases, he/she wantsme to work faster, even if that means shortening the procedure. | 4 (3 - 4) | 3 (2 - 4) | 4 (2 - 4) | 0.021 | | | |
| considers patient safety as a problem that occurs more frequently. | 4 (2.75 - 4) | 3 (2 - 4) | 3 (2 - 4) | 0.339 | | | |
| *Mann_\//bitney/lltest | | | | | | | |

There is no significant difference in self-assessment of the events reported in the hospital by the amount of work experience or education level (Table 8).

4.6. Patient safety rating

Most of the subjects -44 (57.1%) in total – rated patient safety as acceptable, and 21 subjects (27.3%) rated it as very good. Only two subjects rated patient safety as excellent (Figure 2).

| Table 6. Subject responses regarding communication | | | | | | | | |
|--|------------------------|--------------|--------------|--------------|-------------------|-------------|--|--|
| | Number (%) of subjects | | | | | | | |
| | Strongly disagree | Disagree | Neutral | Agree | Strongly agree | Total | | |
| Feedback is given regarding the changes on the basis of a report of an adverse event. | 1 (1) | 10 (10.2) | 46 (46.9) | 29 (29.6) | 12 (12.2) | 98 (100) | | |
| Nurses speak freely if they notice something that may have a negative impact on patient care. | 0 | 3 (3) | 17 (17.2) | 55 (55.6) | 24 (24.2) | 99 (100) | | |
| We are informedabout mistakes made in the ward. | 0 | 8 (8.1) | 41 (41.4) | 33 (33.3) | 17 (17.2) | 99 (100) | | |
| Nurses can freely ask about the superior's decisions. | 0 | 5 (5.1) | 41 (41.4) | 38 (38.4) | 15 (15.2) | 99 (100) | | |
| We can talk about the ways to prevent mistakes in this hospital. | 0 | 5 (5.1) | 22 (22.2) | 51 (51.5) | 21 (21.2) | 99 (100) | | |
| Nurses are afraid to ask for advice when they are not doing things according to the procedure. | 21 (21.2) | 52 (52.5) | 16 (16.2) | 7 (7.1) | 3 (3) | 99 (100) | | |

Table 7. Subject responses regarding the frequency of adverse events

| | Number (%) of subjects | | | | | | |
|--|------------------------|--------------|--------------|------------------|--------------|-------------|--|
| | Never | Rarely | Sometimes | Most of the time | Always | Total | |
| How often is a mistake, which directly affects the patient, reported? | 0 | 6 (6.1) | 47 (48) | 26 (26.5) | 19 (19.4) | 98 (100) | |
| How often is a mistake, which does not potentially harm the patient, reported? | 5 (5.2) | 20 (20.8) | 33 (34.4) | 24 (25) | 14 (14.6) | 96 (100) | |

| Table 8. Mean values of self-assessment of adverse events by years of work experience | | | | | | | |
|---|------------------------------|-----------------|-------------------|--------------|-------|--|--|
| | Median (Interquartile range) | | | | | | |
| | < 1 year | 1 - 10 years | 11 - 20 years | Total | P* | | |
| How often is a mistake, which directly affects the patient, reported? | 3 (3 - 4) | 3 (3 - 4) | 3.5 (3 - 4.75) | 3 (3 - 4) | 0.379 | | |
| How often is a mistake, which does not potentially harm the patient, reported? | 3 (3 - 4) | 3 (3 - 4) | 3 (2.75 - 4) | 3 (2 - 4) | 0.279 | | |
| *Kruskal_\v/allis tost | | | | | | | |



Figure 2. Distribution of subjects by the assessment of patient safety

4.7. Hospital in which they work

39 subjects (39.8%) strongly agree or agree with the claim that the hospital management provides a working environment which promotes patient safety. 65 subjects (65.6%) agree with the claim that hospital wards cooperate, while 52 subjects (53.6%) state that the problems are "covered up" when transferring from one ward to another (Table 9).

34 subjects (34%) state that a maximum of 1 to 2, or 3 to 5 reports of adverse events were made during the last year, 18 subjects (18%) claim that there were no reports, while 1 subject states that there were 11 to 20, or 21 or more reports (Figure 3).

5. Discussion

The research conducted in the University Hospital Centre Osijek which included the opinions of 100 nurses regarding adverse events, including bedsores, falls, nosocomial infections, insufficient hand hygiene and adverse drug side effects, showed that nurses are active in improving the safety culture (82%) and they believe it is acceptable (57.1%). A similar study was conducted in California, in 232 acute hospitals, and it covered adverse events, including patient falls/

| Table 9. Subject responses regarding the claims related to the hospital in which they work | | | | | | | | |
|--|------------------------|--------------|--------------|--------------|-------------------|-------------|--|--|
| | Number (%) of subjects | | | | | | | |
| | Strongly disagree | Disagree | Neutral | Agree | Strongly agree | Total | | |
| Hospital management provides a working environment which promotes patient safety. | 1 (1) | 29 (29.6) | 29 (29.6) | 37 (37.8) | 2 (2) | 98 (100) | | |
| Hospital wards cooperate. | 0 | 13 (13.1) | 21 (21.2) | 63 (63.6) | 2 (2) | 99 (100) | | |
| Problems are "covered up" when transferring from one ward to another. | 2 (2.1) | 11 (11.3) | 32 (33) | 51 (52.6) | 1 (1) | 97 (100) | | |



Figure 3. Distribution of reported adverse events in the last 12 months

injuries, bedsores, adverse drug side effects and nosocomial infections. A multilevel analysis researched the impact of nurses and patients, and hospital characteristics on the outcome of patient care. Results showed that patients do experience adverse events during their hospital stay, and that it is crucial that the number of adverse events decreases in the health system. Having an adequate nursing care is crucial in some cases (13). The results obtained in the University Hospital Centre Osijek show that highly educated nurses and persons holding a Bachelor's degree report adverse events more frequently (45.9%), and that they work longer than it is necessary in order to give the best possible care to a patient (61.7%). Another study which analysed reports of adverse events showed that subjects usually work longer than agreed and that about 40% of the 5,317 shifts exceeded the shift of 12 hours. Risks of error significantly increase when nurses work shifts longer than 12 hours, work overtime or work more than 40 hours a week (14). The research shows that a total of 71 (71.7%) subjects feel that mistakes reflect on them, and 65 (67.7%) of subjects agree with the statement that the mistakes led to positive changes. 72 subjects (72.7%) agree with the claim that serious mistakes do not happen, instead they are just a coincidence, and 70 subjects (72.1%) state that the other ward helps out if one ward is truly busy. When an adverse event is reported, a total of 72 subjects (74.2%) considers it as a report against them, and not a report of a problem. After the changes were made to improve the

safety of patients, 81 subjects (83.5%) assessed their effectiveness. 74 subjects (76.3%) stated that a lot of things were required to be done too fast, and too many of them as well, and 39 subjects (40.3%) stated that they have sacrificed the safety of a patient in order to get more work done. A total of 34 subjects (33.4%) stated that they had a problem with the patient safety culture in their ward, and only 50% of subjects agreed with the claim that procedures and system in place were good at preventing errors. The US Agency for Healthcare Research and Quality (AH-RQ) released a report in 2014 and the data was gathered from 653 hospitals. A total of 405,281 subjects participated in the research, of which 35% were licensed nurses. The results showed that in all working units (81% of positive answers) teamwork was present and that staff there respects each other. When it comes to claims regarding superiors, their expectations and activities that promote patient safety, 76% of subjects think that the supervisor took into consideration the suggestions for improving patient safety and praised the staff for monitoring patients and following safety procedures. Subjects agree that mistakes led to positive changes, and changes were related to efficiency. The result of the adverse events reporting (44%) was that the staff did not feel that their mistakes and reports of adverse event were directed against them. A total of 47% of subjects shared what extent of important information was passed on to hospital units during a shift change. The lack of communication between health professionals and their lack of synchronisation negatively affect the speed of patient recovery, reduction of the incidence of adverse events, and the lowering of treatment cost (15). Regarding the claim related to employment, 55% of subjects spoke about the sufficiency of staff and working hours, believing they were appropriate to provide the best nursing care to patients. In the survey of nurses in the University Hospital Centre Osijek results showed that only 10% of respondents agree that they have enough staff to do the job. Smaller American hospitals had the highest percentage of subjects who rated patient safety as excellent, and 81% of subjects rated it as very good. In major US hospitals, 71% of subjects rated it with the lowest mark, while in the University Hospital Centre Osijek most of the subjects (57.1%) think it is acceptable. Subjects who work in the field of rehabilitation had the highest percentage of positive responses (70%) and employees of emergency medical services had the lowest percentage (59%) of positive responses. Rehabilitation had the highest percentage of subjects who, in their working area/unit, rated patient safety as excellent or very good (86%). Emergency medical services had the lowest score (65%). The intensive care unit (any type) had the highest percentage of subjects who reported one or more adverse events in the past year (61%), while the rehabilitation had the lowest percentage (38%). Responses of subjects who are in direct contact with the patients (49%) are more positive than the ones who are not in direct contact with the patients (42%), but they gave fewer positive marks regarding the support of administration for patient safety (71%) compared to those without direct interaction (77%). The results of the study showed that 39 subjects (39.8%) strongly agree or agree with the statement that the hospital management provides a working environment that promotes patient safety, and 65 subjects (65.6%) agreed with the statement that wards collaborate with each other, while 52 subjects (53.6%) stated that the problems are "covered up" when transferring from one ward to another. Subjects in US hospitals with less than one year of experience had the highest percentage of positive responses (68%) and subjects with one to ten years of experience had the lowest percentage (63% positive). Among subjects who had less than a year of work experience, 82% of them rated patient safety as excellent or very good (16). Subjects with one to five years of work experience have the lowest (74%) percentage. A total of 47% of subjects with six to ten years of experience in their field of work reported one or more adverse events in the last year. Subjects with less than a year of work experience had the lowest (30%) percentage of the adverse event reporting. The results showed that the majority of subjects have 11-20 years of work experience, and that subjects with 20 or more years of work experience reported adverse events more frequently. A trend analysis of over 359 US hospitals that submitted data on patient safety showed improvement of 1-3 per cent in relation to the report from 2014. The US Agency also published a report for 2016. A total of 680 US hospitals with a total of 447,584 patients had submitted data, of which the largest group (36%) is made up from licensed nurses with an average of six years of work experience. 82% of subjects agree that they support each other and treat each other with respect, and 78% of subjects agree with the statement that their supervisor accepts suggestions for improving patient safety. A total of 73% of subjects agree that errors led to positive changes, while 55% of subjects agree with the statement that they feel as if the reported adverse event focused on them. A total of 48% of subjects agree that the relevant information is communicated during the transfer and handover of shift, while 54% believe that there is enough staff for the job. Smaller hospitals (up to 50 hospital beds) evaluated the safety of patients with excellent and very good grades (83%), and larger hospitals (300 to 500 hospital beds) evaluated the safety of patients with the lowest grade (70%). Subjects from non-surgical departments rated patient safety with higher grades (79%) than emergency medical services or the intensive care unit which also reported the highest number of adverse events (one or more) in the last 12 months. Subjects who have been working for less than one year gave a better grade (69%) than those who have been working for ten years (63%). Subjects who have been working for over 20 years reported adverse events more often than those who have been working for one year, and subjects who work in surgical departments and in anaesthesiology increased their grade by an average of 4%, i.e. they reported one or more adverse events in the last 12 months (17). The result analysis showed that 36 subjects (36%) stated that in the last 12 months 1 to 2 or 3 to 5 reports of adverse events were made in the University Hospital Centre Osijek, while 20 subjects (20%) stated that there was no such report. One subject stated that there were 11 to 20 or 21 or more reports.

6. Conclusions

The conducted research drew the following main conclusions:

- 1. Nurses are active in improving the patient safety culture (82%), and they rate it as acceptable (57.1%).
- Nurses agree that they do not have enough staff, but only 50% of subjects agree with the statement that the system is good in preventing adverse events.
- The majority of subjects (74.2%) feel that the report of adverse event is a report against them, and not reporting an adverse event is a problem in their job.
- 4. Highly educated nurses and persons with university degrees report adverse events more frequently and they feel that during high stress periods they have to work faster and shorten the procedure.
- 5. The majority of subjects (86%) agree that they help each other out, and that they treat each other with respect (47%).
- Only 40% of subjects agree with the statement that the hospital administration promotes the patient safety culture.
- 7. Patient safety is an ethical imperative in all nursing care proceedings.

The quality of nursing care needs to be further examined in future research and even more significant parameters which influence the outcomes of nursing care should be encompassed, as well as nurses themselves and hospitals in which they work.

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MIŠLJENJA MEDICINSKIH SESTRA I TEHNIČARA O IZVJEŠĆIVANJU O NEŽELJENIM DOGAĐAJIMA TIJEKOM PROCESA SESTRINSKE SKRBI

Sažetak

Uvod. Sigurnost pacijenata predstavlja najpouzdaniju mjeru kvalitete rada u sestrinstvu. Najčešći su neželjeni događaji povezani s procesom sestrinske skrbi dekubitus, padovi, intrahospitalne infekcije, nedostatna higijena ruku i neželjeni događaji povezani s primjenom lijekova.

Cilj. Cilj je ovoga istraživanja ispitati mišljenja ispitanika o neželjenim događajima tijekom procesa sestrinske skrbi u Kliničkom bolničkom centru Osijek.

Ispitanici i metode. Provedeno je kvantitativno istraživanje s pomoću anonimne ankete koja je obuhvatila 100 medicinskih sestra/tehničara u veljači i ožujku 2016. na klinikama za kirurgiju, internu medicinu, anesteziologiju i neurologiju te u jedinici intenzivnog liječenja i hitnom prijemu.

Rezultati. Istraživanje je pokazalo da su medicinske sestre aktivne u poboljšanju kulture sigurnosti pacijenata (82 % ispitanika). Čak 71,7 % medicinskih sestara misli da se pogreške odražavaju na njih, dok se 67,7 % ispitanika složilo s tvrdnjom da su pogreške dovele do pozitivnih promjena. Kada se neželjeni događaj prijavi, 74,2 % ispitanika osjeća kako su oni osobno prijavljeni, a ne sami događaj. Nakon što naprave promjene kako bi poboljšale sigurnost pacijenata, 83,5 % medicinskih sestara procjenjuje njihovu učinkovitost. Ispitanici, njih 33,4 %, tvrde kako imaju problem u sigurnosti pacijenata u svojem okruženju, a 49 (50 %) ispitanika tvrdi da je sustav dobar u sprječavanju neželjenih događaja. Većina ispitanika (57,1 %) ocjenjuje sigurnost pacijenata prihvatljivom. U sličnim istraživanjima koja su provedena u bolnicama SAD-a općenito je veća razina kulture sigurnosti pacijenata za nekoliko ocjenskih bodova.

Zaključak. Medicinske sestre / medicinski tehničari slažu se kako je kultura sigurnosti pacijenata s obzirom na neželjene događaje povezane s procesom sestrinske skrbi prihvatljiva te da su odgovorni za zaštitu i poboljšanje sigurnosti pacijenata.

Ključne riječi: neželjeni događaji, sestrinska skrb, sigurnost pacijenata

Assessment of Educational Needs of Nursing Students for Improving Patient Safety

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Abstract

Introduction: The education of students related to patient safety is a predictor of the development of a safety culture and thereby increases patient safety in healthcare institutions. A growing emphasis is placed on the development of courses and topics that would enable comprehensive and structured patient safety-related education. In 2011, WHO published the *Multi-professional Patient Safety Curriculum Guide*, consisting of 11 main topics.

Methods: The research was conducted using a questionnaire containing 13 questions, completed by the all second-year students who previously attended the elective course *Patient Safety in Healthcare Institutions* and a control group of all third-year students that did not attend the course. The SPSS program (16.0, SPSS Inc., Chicago, IL, USA) was used for processing and analysing the data. The research was conducted at the University of Applied Health Sciences in Zagreb, Croatia.

Results: The study included 170 students of the second and third years of the nursing study program. The conducted research showed a statistical difference in the responses between students of the second and third years, considering their previous education on patient safety. 90.36% of the second-year students stated that they applied safe practices to prevent drugadministration related incidents, while 70.73% of the third-year students reported the same. The difference in the responses is associated with prior education.

Conclusion: Regardless of the year of the study, students showed a great interest in the education and learning of practical skills in patient safety.

Introduction

There are many definitions of *patient safety*, but they all have the same purpose in mind – to prevent adverse events and improve the safety of the patient. Some of the most common definitions are:

Patient safety is the absence of preventable harm to a patient during the process of healthcare (1). Patient safety defines as making care continually safer by reducing harm and preventable mortality (2).

The incidence of adverse events in the healthcare system is estimated at 43 million during one year, which means that 1 in 10 patients experiences some sort of adverse event during their hospitalization (1). The Canadian Adverse Event Study also reported that 7.5% of patients hospitalized in Canada were harmed by failure of healthcare delivery (3). Research conducted by Jha et al. showed that the most common type of adverse event in high-income countries were adverse drug events, while the most common in low-income and middle-income countries were venous thromboembolisms (4).

To prevent errors, adverse events and near misses in healthcare, it was suggested that patient safety education for health professionals requires an improvement (Greiner and Knebel, 2003, qtd. in 5).

The discipline of patient safety includes the coordinated efforts to prevent harm, caused by the process of healthcare itself, from occurring to patients. Patient safety has been increasingly recognized as an issue of global importance (6). Building safer healthcare is a global concern that depends on the quality of nursing education (7).

In May 2002, the 55th World Health Assembly adopted resolution WHA55.18, which urged countries to pay the greatest possible attention to patient safety and requested the Director General of WHO to "support the efforts of Member States to promote a culture of safety", including:

- Development of global norms and standards;
- Promotion of evidenced-based policies;
- Promotion of mechanisms to recognize excellence in patient safety internationally;
- Encouragement of research;
- Provision of assistance to countries in several key areas (1).

Patient safety is being recognized as an indicator of the quality of care and thus is progressively integrated into the education of healthcare professionals. Raising awareness about the possibility of adverse events in the provision of healthcare and the role of healthcare professionals in its development is extremely important. Numerous relevant sources state that raising awareness is one of the main predictors of improving patient safety, and can be done without investing significant material resources. Patient safety education is important in early years when students are establishing the foundations for their clinical practice (8).

Patient safety education should seek to envelop the most common critical moments for the occurrence adverse events, such as washing hands, invasive procedures, drug administration and many others.

The important segment of this education is learning from adverse events that have already occurred in the past, where students are exposed to as many adverse events as possible, with the objective to analyse what caused them and to develop as many interventions as possible that could prevent the incident.

In 2011, WHO published a document titled Multiprofessional Patient Safety Curriculum Guide comprised of 11 major areas (9). It is a guide for all countries, cultures and contexts (10). Also, the 'National Patient Safety Education Framework for Australia' consists of seven areas and topics: communicating effectively; identifying, preventing and managing adverse events and near misses; using evidence and information, working safely, being ethical; continuing learning and specific issues (11).

The aim of this initiative (Curriculum Guide) was to assist universities and schools in several healthcare fields, including nursing, to deliver consistent and structured patient safety education in order to improve patient care (9).

Nursing students showed a great interest in the education on patient safety, which therefore makes a systematic and structured approach to this education an important objective. Education about patient safety motivates students to choose behaviours that enhance rather than reduce patient safety (12-17).

Educating students, and simultaneously raising awareness about the possibility of an adverse event, increases the quality of provided care, while the education on the importance of following specific guidelines and protocols during certain procedures reduces the occurrence of adverse events to a minimum.

The aims of this research were to:

- 1. determine the level of acquired knowledge related to patient safety through the courses of the undergraduate nursing study program,
- determine students' satisfaction with the availability of the information related to patient safety,
- 3. determine students' interest in certain topics from the education on patient safety.

The aim of this research was to select the best way of educating students on patient safety in the healthcare environment through objective indicators. Results of this research will enable the improvement of the organization and content of the elective course Patient Safety in Healthcare Institutions by additionally including areas of major interest for the students.

Methods

The research was conducted in the summer semester of the academic year 2016/2017 at the University of Applied Health Sciences in Zagreb, Croatia.

Research description

After being fully informed about the research, students were asked to fill in a questionnaire.

Materials and methods

The study included 170 students of the second and third years of the nursing study program, and three respondents who did not answer the socio-demographic questions. The respondents were full-time students. All of the second-year students attended the elective course Patient Safety in Healthcare Institutions, and none of the third-year students attended the elective course Patient Safety in Healthcare Institutions.

The students were asked to fill in an anonymous questionnaire. The questionnaire was modified and it was similar to the questionnaire made by the authors Van Geest, JB and Cummins DS published in 2002 (18). The questionnaire contained 13 questions. The first 10 questions were related to education about patient safety, and were also related to the level of student interest in special topics related to patient safety. The last three questions were related to age, gender and year of the study. Most of the questions offered "Agree", "Disagree" and "Not sure" as possible answers. For the rest of the questionnaire, "Very interested", "Somewhat interested" and "Not at all interested" were possible answers. The second, third and eighth questions offered the option of multiple sub-questions, the second question offered nine sub-questions, the third offered six sub-questions and the eighth offered 21 sub-questions.

Ethics

The proposed research was conducted in accordance with ethical principles for research on humans based on the principles of the Helsinki Declaration and in accordance with all applicable guidelines of the code of ethics of the profession. The Ethics Committee of the University confirmed and gave approval for conducting the research.

Data processing methods

The SPSS program (16.0, SPSS Inc., Chicago, IL, USA) was used for processing and analysing the data. The results are shown as the arithmetic mean (M) and standard deviation (SD) as a measure of descriptive statistics, calculating the average values for item representation of each procedure. The significance of the test was set at 5% (level of significance of 5% is equal to 95% reliability).

Results

The study included 167 students of the second and third years of the nursing study program while 3 of the respondents did not answer all of the questions. Data on the age of the respondents showed that the arithmetic mean was 21.74 with standard deviation of 2.192, with the minimum value of 18 years old and the maximum value of 40 years old.

| Table 1. Age of the respondents | | | | | | |
|---------------------------------|-----------|--|--|--|--|--|
| Number | Valid 167 | | | | | |
| Number | Missing 3 | | | | | |
| Arithmetic mean | 21.74 | | | | | |
| Standard deviation | 2.192 | | | | | |
| Minimum | 18 | | | | | |
| Maximum | 40 | | | | | |

| Table 2 | . Gender of | the respon | ndents |
|---------------|-------------|------------|------------|
| | | Number | Percentage |
| | Female | 143 | 85.6 |
| Gender of the | Male | 24 | 14.4 |
| respondents | Total | 167 | 100.00 |

Data on the gender of the respondents showed that 85.6% were female, while 14.4% were male.

| Table 3. Year of study | | | | | | | | |
|------------------------|---------------------------------|--------|------------|--|--|--|--|--|
| | | Number | Percentage | | | | | |
| | Partial 2 nd year | 2 | 1.20 | | | | | |
| | 2 | 83 | 49.70 | | | | | |
| Year of study | З | 82 | 49.10 | | | | | |
| | Total | 167 | 100.00 | | | | | |

Data on year of the study showed that 49.70% of the respondents were in the second year of the nursing study program, while 49.10% of the respondents are currently enrolled in the third year of the nursing study program.

Given that Fischer's exact test showed a significance of 0.012, which is less than 0.05, we can say that in the respondents' answers to the question *Despite the findings, there is disagreement on the extent to which errors occur in healthcare every day. Please rate the importance of patient safety as an issue in healthcare today* there is a statistically significant difference in observed frequency of the response related to the year of study. Second-year students give greater importance to patient safety.

Table 5 contains descriptive indicators for respondents of the second and third year of the nursing study program regarding the perception of patient safety. Frequencies and percentages are stated for each question. Questions which recorded the smallest and largest value of the arithmetic mean in regard to the year of study are reviewed.

The highest percentage for the respondents on the second year of the nursing study program is 92.8% and it is recorded for the question: *There is a relationship between patient safety and quality of care.*

The lowest value of percentage for the respondents on the second year of the nursing study program is

Table 4. Results of the question regarding the year of study: Despite the findings, there is disagreement on the extent to which errors occur in healthcare every day. Please rate the importance of patient safety as an issue in healthcare today.

| Despite the findings, there is disagreement on the extent to which errors occur in healthcare every day. Please rate the importance of patient safety as an issue in healthcare today. | | Very important | Important | Somewhat important | Total | |
|---|--------------|--------------------------------|-----------|-----------------------|-------|-------|
| | | Number | 60 | 20 | 0 | 80 |
| Year of study | 2 | % within a year of study | 75.0 | 25.0 | 0.0 | 100.0 |
| | | Number | 47 | 34 | 1 | 82 |
| | З | % within a year of study | 57.3 | 41.5 | 1.2 | 100.0 |
| To | tal | Number | 107 | 54 | 1 | 162 |
| % within a y | ear of study | 66.7 | 32.7 | 0.6 | 100.0 | |

| Table 5. Perception of patient safety | | | | | | |
|---|----------|---------------|------------|--------|------------|--|
| | | Year of study | | | | |
| | | | 3 | | | |
| | | Number | Percentage | Number | Percentage | |
| | Agree | 28 | 33.7 | 28 | 34.1 | |
| Safety is better addressed at | Disagree | 27 | 32.5 | 20 | 24.4 | |
| level of the individual. | Not sure | 28 | 33.7 | 34 | 41.5 | |
| | Total | 83 | 100.0 | 82 | 100.0 | |
| | Agree | 75 | 90.4 | 61 | 74.4 | |
| Safer environment for patients | Disagree | 6 | 7.2 | 13 | 15.9 | |
| workers. | Not sure | 2 | 2.4 | 8 | 9.8 | |
| | Total | 83 | 100.0 | 82 | 100.0 | |
| | Agree | 41 | 49.4 | 46 | 56.1 | |
| Everyone in healthcare shares | Disagree | 34 | 41.0 | 26 | 31.7 | |
| a collective responsibility for errors. | Not sure | 8 | 9.6% | 10 | 12.2 | |
| | Total | 83 | 100.0 | 82 | 100.0 | |
| | Agree | 75 | 90.4 | 76 | 92.7 | |
| Multidisciplinary partnerships | Disagree | 1 | 1.2 | 1 | 1.2 | |
| errors in healthcare. | Not sure | 7 | 8.4% | 5 | 6.1 | |
| | Total | 83 | 100.0 | 82 | 100.0 | |
| | Agree | 77 | 92.8 | 75 | 91.5 | |
| There is a relationship | Disagree | З | 3.6% | З | 3.7 | |
| detween patient safety and quality of care. | Not sure | З | 3.6% | 4 | 4.9 | |
| | Total | 83 | 100.0 | 82 | 100.0 | |
| | Agree | 76 | 91.6 | 59 | 72.0 | |
| Patient safety has become a | Disagree | 1 | 1.2 | 5 | 6.1 | |
| my institution. | Not sure | 6 | 7.2 | 18 | 22.0 | |
| | Total | 83 | 100.0 | 82 | 100.0 | |
| | Agree | 44 | 53.0 | 32 | 39.0 | |
| l know the proper channels to | Disagree | 7 | 8.4% | 16 | 19.5 | |
| report safety concerns. | Not sure | 32 | 38.6 | 34 | 41.5 | |
| | Total | 83 | 100.0 | 82 | 100.0 | |
| | Agree | 68 | 81.9 | 52 | 63.4 | |
| Errors represent a significant | Disagree | З | 3.6 | 13 | 15.9 | |
| ethical challenge to healthcare. | Not sure | 12 | 14.5 | 17 | 20.7 | |
| | Total | 83 | 100.0 | 82 | 100.0 | |

33.7% and it is recorded for questions: *Safety is better addressed at the system level than at the level of the individual* and: *Everyone in healthcare shares a collective responsibility for errors.*

The highest value of percentage for the respondents of the third year of the nursing study program is 92.7% and it is recorded for the question: *Multidisciplinary partnerships are essential for preventing errors in healthcare.*

The lowest value of the percentage for the respondents of the third year of the nursing study program is 34.1% and it is recorded for questions: Safety is better addressed at the system level than at the level of the individual and: I know the proper channels to report safety concerns.

Table 6 contains descriptive indicators for respondents of the second and third year of the nursing study program regarding the perception of acquired knowledge related to patient safety. Data for each question is displayed in frequencies and percentages.

The highest value of percentage for the respondents on the second year of the nursing study program is

| Table 6. Perception of acquired knowledge related to patient safety | | | | | | |
|---|----------------|--------|------------|--------|------------|--|
| | | | Year of | study | | |
| | | | 2 | | 3 | |
| | | Number | Percentage | Number | Percentage | |
| | Yes | 60 | 72.29 | 19 | 23.17 | |
| Attended training programs or | No | 23 | 27.71 | 61 | 74.39 | |
| conferences on patient safety? | Not Applicable | 0 | .00 | 2 | 2.44 | |
| | Total | 83 | 100.00 | 82 | 100.00 | |
| | Yes | 77 | 92.77 | 35 | 42.68 | |
| Implemented or worked with a | No | 6 | 7.23 | 44 | 53.66 | |
| and analysing healthcare errors? | Not Applicable | 0 | .00 | З | 3.66 | |
| | Total | 83 | 100.00 | 82 | 100.00 | |
| | Yes | 54 | 65.06 | 31 | 37.80 | |
| Read reports on patient safety? | No | 29 | 34.94 | 49 | 59.76 | |
| Read reports on patient safety: | Not Applicable | 0 | .00 | 2 | 2.44 | |
| | Total | 83 | 100.00 | 82 | 100.00 | |
| | Yes | 75 | 90.36 | 58 | 70.73 | |
| Employed practices to identify | No | 6 | 7.23 | 18 | 21.95 | |
| and reduce medication errors? | Not Applicable | 2 | 2.41 | 6 | 7.32 | |
| | Total | 83 | 100.00 | 82 | 100.00 | |
| | No response | 1 | 1.20 | 0 | .00 | |
| Discussed patient safety | Yes | 77 | 92.77 | 70 | 85.37 | |
| concerns with colleagues and/or | No | 4 | 4.82 | 12 | 14.63 | |
| supervisors? | Not Applicable | 1 | 1.20 | 0 | .00 | |
| | Total | 83 | 100.00 | 82 | 100.00 | |
| | No response | 0 | .00 | 2 | 2.44 | |
| | Yes | 63 | 75.90 | 63 | 76.83 | |
| Identified errors in patient care? | No | 17 | 20.48 | 15 | 18.29 | |
| | Not Applicable | 3 | 3.61 | 2 | 2.44 | |
| | Total | 83 | 100.00 | 82 | 100.00 | |

| Table 7. Results of the question regarding the year of study: Do you have an interest in education, training and skill development in patient safety? | | | | | | | |
|--|---|--------------------------|---------------|----------|----------------|--------|--|
| | Do you have an interest in education, training and skill development in patient safety? | | | | | | |
| | | | Much interest | Interest | No interest | | |
| | | Number | 18 | 64 | 1 | 83 | |
| Voor of study | 2 | % within a year of study | 21.7% | 77.1% | 1.2% | 100.0% | |
| fear of study | | Number | 20 | 55 | 7 | 82 | |
| | 3 | % within a year of study | 24.4% | 67.1% | 8.5% | 100.0% | |
| | | Number | 38 | 119 | 8 | 165 | |
| Total | % within a year of study | 23.0% | 72.1% | 4.8% | 100.0% | | |

92.77% and it is recorded for questions: Implemented or worked with a non-punitive system for reporting and analysing healthcare error? and Discussed patient safety concerns with colleagues and/or supervisors?.

The lowest value of percentage for the respondents on the second year of the nursing study program is 65.06% and it is recorded for the question: Read reports on patient safety?

The highest value of percentage for the respondents of the third year of the nursing study program is 76.83% and it is recorded for the question: Identified errors in patient care?

The lowest value of percentage for the respondents of the third year of the nursing study program is 23.17% and it is record for question: Attended training programs or conferences on patient safety?

| Table 8. | Table 8. Results to the question regarding the year of study: Is the education about patient safety and skill development available to you? | | | | | | | | |
|----------|--|-----------------------------|----------------|-------------------|-----------|-----------------------|-------------------------|--------|--|
| | Is the education about patient safety and skill development available to you? | | | | | | | Total | |
| | | | No response | Very available | Available | Somewhat available | Not at all available | Total | |
| | | Number | 0 | 5 | 61 | 17 | 0 | 83 | |
| Year of | 2 Year of | % within a year of study | 0.0% | 6.0% | 73.5% | 20.5% | 0.0% | 100.0% | |
| study | | Number | 1 | 2 | 27 | 50 | 2 | 82 | |
| | 3 | % within a year of study | 1.2% | 2.4% | 32.9% | 61.0% | 2.4% | 100.0% | |
| | | Number | 1 | 7 | 88 | 67 | 2 | 165 | |
| Total | | % within a year of study | 0.6% | 4.2% | 53.3% | 40.6% | 1.2% | 100.0% | |

Fischer's exact test showed a significance of 0.071, which is higher than 0.05. Therefore, we can say that in the respondents' answers to the question *Do you* have an interest in education, training and skill development in patient safety? there is no statistically significant difference in observed frequencies of the response related to the year of study.

Fischer's exact test showed a significance of 0.000, which is less than 0.05. Therefore, we can say that in the respondents' answers to the question *Is the education about patient safety and skill development*

available to you? there is a statistically significant difference in observed frequencies of the response related to the year of study. Second-year students report that education is more available to them.

Table 9 contains descriptive indicators for the group of questions which are related to a topic of interest. Data for each question is displayed in frequencies, percentages, arithmetic mean and standard deviation. Questions which recorded the smallest and the largest value of the arithmetic mean of answers are reviewed.

| Table 9. Please indicate y | our level of interest | : in learnin | g more about t | he followi: | ng topics |
|---|-----------------------|--------------|----------------|-------------|-----------|
| | | Number | Percentage | x | sd |
| | Very interested | 44 | 25.88 | | |
| Theories of human error | Interested | 109 | 64.12 | | |
| meenes of numuri citor | Not at all interested | 17 | 10.00 | | |
| | Total | 170 | 100.00 | 1.84 | .58 |
| | Very interested | 60 | 35.29 | | |
| Models for error identification | Interested | 99 | 58.24 | | |
| Models for erfor identification | Not at all interested | 11 | 6.47 | | |
| | Total | 170 | 100.00 | 1.71 | .58 |
| | Very interested | 78 | 45.88 | | |
| Model for error reduction | Interested | 82 | 48.24 | | |
| Model for error reduction | Not at all interested | 10 | 5.88 | | |
| | Total | 170 | 100.00 | 1.60 | .60 |
| | No response | 1 | .59 | | |
| | Very interested | 69 | 40.59 | | |
| Information-based strategies to improve patient safety | Interested | 87 | 51.18 | | |
| implove patient surety | Not at all interested | 13 | 7.65 | | |
| | Total | 170 | 100.00 | 1.66 | .63 |
| | Very interested | 51 | 30.00 | | |
| Models for constructively dealing | Interested | 100 | 58.82 | | |
| with unsafe practices | Not at all interested | 19 | 11.18 | | |
| | Total | 170 | 100.00 | 1.81 | .62 |
| | Very interested | 71 | 41.76 | | |
| | Interested | 83 | 48.82 | | |
| Salety plactices, standaldization | Not at all interested | 16 | 9.41 | | |
| | Total | 170 | 100.00 | 1.68 | .64 |
| | Very interested | 75 | 44.12 | | |
| | Interested | 83 | 48.82 | | |
| System for reporting errors | Not at all interested | 12 | 7.06 | | |
| | Total | 170 | 100.00 | 1.63 | .61 |

| Table 9. Please indicate y | our level of interest | in learnin | g more about 1 | he followi: | ng topics |
|---|-----------------------|------------|----------------|-------------|-----------|
| | | Number | Percentage | x | sd |
| | Very interested | 81 | 47.65 | | |
| Patient safety in hospital-based settings | Interested | 80 | 47.06 | | |
| | Not at all interested | 9 | 5.29 | | |
| | Total | 170 | 100.00 | 1.58 | .59 |
| | Very interested | 37 | 21.76 | | |
| Patient safety in out-of-hospital | Interested | 109 | 64.12 | | |
| settings | Not at all interested | 24 | 14.12 | | |
| | Total | 170 | 100.00 | 1.92 | .60 |
| | No response | 1 | .59 | | |
| | Very interested | 92 | 54.12 | | |
| Proven medication safety | Interested | 64 | 37.65 | | |
| practices | Not at all interested | 13 | 7.65 | | |
| | Total | 170 | 100.00 | 1.52 | .65 |
| | No response | 14 | 8.24 | | |
| Establishing and promoting | Very interested | 44 | 25.88 | | |
| interdisciplinary teams to address | Interested | 93 | 54.71 | | |
| patient safety | Not at all interested | 19 | 11.18 | | |
| | Total | 170 | 100.00 | 1.69 | .78 |
| | No response | 5 | 2.94 | | |
| | Very interested | 43 | 25.29 | | |
| "Culture of safety" | Interested | 90 | 52.94 | | |
| | Not at all interested | 32 | 18.82 | | |
| | Total | 170 | 100.00 | 1.88 | .74 |
| | No response | 15 | 8.82 | | |
| Mothods for making safety a | Very interested | 82 | 48.24 | | |
| system-wide objective (work | Interested | 64 | 37.65 | | |
| hours, workloads, staffing) | Not at all interested | 9 | 5.29 | | |
| | Total | 170 | 100.00 | 1.39 | .72 |
| | No response | 7 | 4.12 | | |
| | Very interested | 70 | 41.18 | | |
| Patient perception of error | Interested | 76 | 44.71 | | |
| | Not at all interested | 17 | 10.00 | | |
| | Total | 170 | 100.00 | 1.61 | .72 |
| | No response | 5 | 2.94 | | |
| | Verv interested | 48 | 28.24 | | |
| Legal issues | Interested | 78 | 45.88 | | |
| <u> </u> | Not at all interested | 39 | 22.94 | | |
| | Total | 170 | 100.00 | 1.89 | .79 |

| Table 9. Please indicate y | our level of interest | in learnin | g more about 1 | the followi | ng topics |
|--|-----------------------|------------|----------------|-------------|-----------|
| | | Number | Percentage | x | sd |
| | No response | З | 1.76 | | |
| | Very interested | 54 | 31.76 | | |
| Ethical issues | Interested | 84 | 49.41 | | |
| | Not at all interested | 29 | 17.06 | | |
| | Total | 170 | 100.00 | 1.82 | .73 |
| | No response | З | 1.76 | | |
| | Very interested | 52 | 30.59 | | |
| Interpersonal communication strategies | Interested | 85 | 50.00 | | |
| StrateBies | Not at all interested | 30 | 17.65 | | |
| | Total | 170 | 100.00 | 1.84 | .73 |
| | No response | З | 1.76 | | |
| | Very interested | 62 | 36.47 | | |
| Methods of reporting errors to patient, family, media | Interested | 85 | 50.00 | | |
| patient, taning, theat | Not at all interested | 20 | 11.76 | | |
| | Total | 170 | 100.00 | 1.72 | .69 |
| | No response | 35 | 20.59 | | |
| | Very interested | 23 | 13.53 | | |
| Other | Interested | 62 | 36.47 | | |
| | Not at all interested | 50 | 29.41 | | |
| | Total | 170 | 100.00 | 1.75 | 1.09 |

The highest value of arithmetic means is 1.92 and it is reported for the question: *Patient safety in out-of-hospital settings* with standard deviation of 0.60, and for question: *Legal issues* with arithmetic mean of 1.89 and standard deviation of 0.79.

The lowest value of arithmetic means is 1.39 and it is reported for questions: *Methods for making safety a*

system-wide objective (work hours, workloads, staffing...) with the standard deviation of 0.72, and question *Proven medication safety practices* with arithmetic mean of 1.52 and standard deviation of 0.65.

If we look at the value of significance for the perception of patient safety, we can see that the significance of the t-test is less than 5%, that is, p = 0.001.

| Table 10. t-test - Testing differences in responses related to the year of study | | | | | | |
|--|---|---|------|--------|---------|------|
| | | Levene's test for equality of variances | | t-test | | |
| | | F | Sig. | t | df | р |
| Perception of patient safety | The equality of variances is assumed | 1.062 | .304 | -3.481 | 163 | .001 |
| | The equality of variances is not assumed | | | -3.479 | 160.625 | .001 |
| Level of interest in learning more about the following topics | The equality of variances is assumed | .575 | .449 | -8.046 | 160 | .000 |
| | The equality of variances is not assumed | | | -8.041 | 159.046 | .000 |
Therefore, we can say with a 95% confidence level that there is a statistically significant difference in the perception of safety responses related to the year of study.

If we look at the level of interest in learning more about the following topics, we can see that the significance of the t-test is less than 5%, that is, p = 0.000. Therefore, we can say with a 95% confidence level that there is a statistically significant difference in the responses for topical motivation with respect to the year of study.

Discussion

The research points to some differences in the results between the second and third-year students of nursing. In the first question, which relates to raising awareness about the safety of patients, differences in responses between second-year and third-year students have been statistically proven. Students who have had formal education regarding the safety of patients in a health institution in an elective course showed greater sensitivity to the problem of patient safety in health institutions. One of the aims of implementing education on patient safety is developing awareness of the possibility of adverse events and the role of healthcare professionals in causing them. A study conducted in 2015 revealed that students' understanding, attitudes and sense of responsibility regarding patient safety improved after education (19).

When asked Where they most frequently seek information on patient safety, students usually responded that they obtain information from professors and mentors during practical training. If the students stated that they were not satisfied with the availability of formal education on patient safety and having to explain the reason, they usually mentioned the absence of formal courses (third-year students) and short duration of courses on the safety of patients in a health institution (second-year students).

Fisher's exact test showed a statistical significance of 0.071, which is higher than 0.05, therefore we can conclude that there is no statistically significant dif-

ference in the responses of respondents based on the year of study for the question *Do you have an interest in education, training and skill development in patient safety?*

A research conducted in 2012 in teaching hospitals in Iran also showed that 80% of the respondents wanted to attend education related to patient safety (20). Many authors state the importance of the implementation of continuous education on patient safety in the education of healthcare professionals (21).

From 18 topical units, students had to rank the level of interest in a particular topic. Among three interest levels, students had to choose between: very interested, interested and not interested. The results were as follows: 54.12% stated that the area of greatest interest was *Proven medication safety practices*; 48.24% stated *Methods for making safety a system-wide objective (work hours, workloads, staffing...)*, and 47.65% of them stated that *Patient safety in hospital-based settings* was of most interest. The minimum percentage of interest was expressed for *Patient safety in out-of-hospital settings* (21.76%); 25.29% of students stated *Culture of safety* and 25.88% stated *Establishing and promoting interdisciplinary teams to address patient safety*.

A 2002 survey by the National Patient Safety Foundation indicated that the areas of greatest student interest were *Proven medication safety practices* - 75.8%, *Methods for making safety a system-wide objective (work hours, workloads, staffing...)* - 75.7%, and *Ethical Issues* - 72.1% of students. As subject areas of least interest, the students identified *Models for error identification* - 46.7%, *Patient safety in out-of-hospital settings* - 43.3%, and the *Theories of human error* - 36.4% (18).

Conclusion

The research indicates that the nursing students show a significant interest in education about patient safety and the development of skills related to the detection and prevention of adverse events. Enabling students to obtain such a specific education through a separate course ensures that all relevant and important topics on patient safety are systematically and thoughtfully presented. Differences in the results between nursing students of the second and third year of study related to the perception of patient safety are statistically significant, as well as the self-perception of knowledge related to the field. Second-year nursing students that have finished the education as part of the elective course Patient Safety in Healthcare Institutions show significantly better results for both perception of patient safety and perception of acquired knowledge related to patient safety tests.

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PROCJENA OBRAZOVNIH POTREBA STUDENATA STUDIJA SESTRINSTVA U SVRHU POVEĆANJA SIGURNOSTI PACIJENTA U ZDRAVSTVENOJ USTANOVI

SAŽETAK

Uvod. Edukacija studenata povezana sa sigurnošću pacijenata prediktor je razvijanja kulture sigurnosti te time i povećanja sigurnosti pacijenta u zdravstvenoj ustanovi. Sve se veći naglasak stavlja na organizaciju kolegija te tematska područja unutar kojih bi se omogućila cjelovita i strukturirana edukacija povezana sa sigurnošću pacijenata. WHO je stoga 2011. godine izdao kurikulum *Multi-professional Patient Safety Curriculum Guide* koji se sastoji od 11 glavnih tematskih područja.

Metode. Istraživanje je provedeno upotrebom upitnika koji se sastoji od trinaest pitanja. U istraživanje su uključene dvije skupine studenata, prva skupina studenata druge godine studija sestrinstva, gdje su svi pohađali izborni kolegij Sigurnost pacijenta u zdravstvenoj ustanovi, te kontrolna skupina studenata treće godine studija koja nije pohađala navedeni izborni kolegij. Dobiveni podaci sustavno su analizirani upotrebom programa SPSS (16.0, SPSS Inc., Chicago, IL, SAD). Istraživanje je provedeno na Zdravstvenom veleučilištu u Zagrebu.

Rezultati. U istraživanju je sudjelovalo 170 studenata druge i treće godine studija sestrinstva. Provedenim je istraživanjem statistički dokazana razlika u odgovorima studenata druge i treće godine s obzirom na prethodnu edukaciju povezanu sa sigurnošću pacijenata. Čak 90,36 % ispitanika druge godine studija navodi kako su primjenjivali sigurnu praksu kako bi spriječili krivu primjenu lijeka, dok 70,73 % ispitanika treće godine studija navodi isti podatak. Razlika u odgovorima povezana je s prethodnom edukacijom.

Zaključak. Studenti bez obzira na godinu studija pokazuju veliki interes za edukaciju i učenje praktičnih vještina iz područja sigurnosti pacijenata.

Ključne riječi: edukacijske potrebe, sigurnost pacijenata, student, studij sestrinstva

Knowledge and Behaviour of Female Students in Relation to Cervical Cancer Prevention

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Keywords: Prevention of cervical cancer, risk factors, cervical cancer

Abstract

Introduction. Cervical cancer is the eighth most common cancer affecting the female population in Croatia with an incidence of 13.2/100,000, which is unsatisfactory in comparison with other countries. The goal of this research is to determine if there is a difference between knowledge and behaviour of female students from different universities regarding risk factors which affect the development of cervical cancer.

Participants and methods. A cross-sectional study consisting of female students attending University Undergraduate Study of Nursing (Josip Juraj Stross-mayer University of Osijek, Faculty of Medicine in Osijek) and Integrated Undergraduate and Graduate Five-Year University Class Teacher Education Studies (Josip Juraj Strossmayer University of Osijek, Faculty of Teacher Education in Osijek, dislocated programme in Slavonski Brod). The research included 80 female students whose average age was 22 years. Research was conducted using an anonymous questionnaire which contained 23 questions concerning risk factors which affect the development of cervical cancer.

Results. Participants are not familiar with the risk factors that affect the development of cervical cancer, especially the students attending the Faculty of Teacher Education – 33 of them (78.6%) (Fisher's exact test, p <0.001). Annually only 47 participants (58.8%), 28 (73.7%) of them attending the Faculty of Medicine, and considerably fewer, 19 participants (45.2%) attending the Faculty of Teacher Education (Fisher's exact test, p = 0.012), undergo gynaecological examinations and do Pap tests, or as recommended by their gynaecologist. The research shows that 19 (45.2%) participants attending the Faculty of Teacher Education use condoms for protection, compared to 28 (73.7%) participants attending the Faculty of Medicine (Fisher's exact test, p=0.0127).

Conclusion. This research shows that there is a difference in the knowledge and behaviour linked to cervical cancer prevention between female students who are students of the Study of Nursing and female students of Teacher Education Studies.

Introduction

Cervical cancer is the second most common malignancy affecting women in the world. According to the Cancer Registry of the Croatian Institute of Public Health for 2014, it is the eighth most common cancer affecting female population in Croatia, with an incidence rate of 13.2/100.000, which is unsatisfactory in comparison with other countries (1). Every case of cervical cancer is a form of cancer that is one of the easiest to prevent. Cervical cancer is slow-developing, it can be seen, and diagnostics is relatively simple. Non-invasive cervical cancer is the only malignancy, other than skin cancer, where one can expect full recovery (2). The biggest problem is, however, that it is not enough to have worldclass physicians and superior medical equipment for early diagnosis of cervical cancer. The most important role is the patient's understanding of the significance of prevention, early diagnosis and regular control. We distinguish between primary and secondary prevention. The process of *primary prevention* includes education of adolescents, such as health education, and self-protection against the causes and risk. Currently, primary prevention includes responsible sexual behaviour, i.e. modification of sexual behaviour in terms of a smaller number of sexual partners and the improvement of sexual hygiene, including the use of condoms in accordance with the recommendations for the prevention of AIDS and sexually transmitted diseases. Special attention should be paid to health and educational activities on sexual behaviour and sexual hygiene, as well as warning about the effects of smoking and long-term use of oral contraceptives. Primary prevention is the prevention of cancer caused by HPV and the use of the HPV vaccine to reduce the risk of cervical cancer. The vaccine is effective in women aged 16 to 26. Secondary prevention means early detection of the disease, i.e. a visit to a gynaecologist and a cytological analysis at the start of sexual activity, but no later than the age of 20, since such regular controls can detect causes of sexually transmitted infections, pre-stages and the earliest stages of cancer when it is still curable (3).

According to the data of the Institute of Public Health, infection with high-risk types of HPV is most common in adolescents and young women. It is important to check whether there is a difference in the knowledge and behaviour of respondents with regard to the type of study programme.

Hypothesis

There is a difference in the knowledge and behaviour linked to cervical cancer prevention between University Undergraduate Study of Nursing students and students of Integrated Undergraduate and Graduate Five-Year University Class Teacher Education Studies.

Aims

To determine whether there is a difference in the knowledge and behaviour of students in relation to risk factors affecting the incidence of cervical cancer according to the type of study programme – University Undergraduate Study of Nursing (Josip Juraj Strossmayer University of Osijek, Faculty of Medicine in Osijek) and Integrated Undergraduate and Graduate Five-Year University Class Teacher Education Studies (Josip Juraj Strossmayer University of Osijek, Faculty of Osijek, Faculty of Teacher Education in Osijek, dislocated programme in Slavonski Brod).

Patients and Methods

A cross-sectional study on female students attending the Study of Nursing and Teacher Education Studies during March and April 2013. The study included 80 female students. On the day of the survey, we found 38 of 40 respondents who were Nursing students, while we found 43 of 45 respondents at Teacher Education Studies, but one of the respondents was 27 years old and did not meet the given age criteria of 20 to 25 years. A questionnaire containing 23 items was used as a testing instrument. It included questions on knowledge and behaviour related to risk factors that affect the incidence of cervical cancer. Each question had between two and seven offered answers and the respondents were instructed to circle one or more correct answers. Questions 1-10 were related to respondents' knowledge, and questions 11-23 were related to their behaviour.

Ethics

All respondents were aware of the aim of the research and gave their consent to participate.

Statistics

The results are shown using basic measures of arithmetic mean and scattering. Normality of the observed numerical variables was tested using the Kolmogorov-Smirnov test. Categorical variables are described in absolute and relative frequencies.

The differences between categorical variables were tested using the $\chi 2$ test and the Fisher's exact test. For the assessment of significance of the results, significance level of $\alpha = 0.05$ was chosen.

Original written programs for databases and the statistical package Statistica for Windows 2005 (version 7.1, StatSoft Inc., Tulsa, OK, USA) were used.

Results

Significantly less knowledge was shown by respondents from the Teacher Studies who did not know that the Pap test is an effective method for early detection of cervical cancer (Fisher's exact test, p = 0.005) and that changing sexual partners is a risk factor for cervical cancer (Fisher's exact test, p < 0.001).

Also, significantly more correct answers were given by the respondents from the Study of Nursing to the statement that HPV is one of the causes of cervical cancer (Fisher's exact test, p <0.001) compared to 14 (33%) respondents from Teacher Education Studies who responded that they did not know the answer.

23 (54%) respondents from Teacher Education Studies did not know that early pregnancy is a risk factor for the development of cervical cancer, and 11 (26.2%) considered that to be an incorrect statement (Fisher's exact test, p = 0.003). Significantly fewer respondents from Teacher Education Studies knew about the HPV vaccine, which reduces the risk of cervical cancer (Fisher's exact test, p < 0.001) (Table 1).

More than half of the respondents do not know what the risk factors for cervical cancer are.

Significantly more respondents studying Nursing know that smoking cigarettes is a risk factor (Fisher's exact test, p < 0.001), as well as a larger number of pregnancies (Fisher's exact test, p = 0.024).

Significantly more respondents studying at Teacher Education Studies, 33 (78.6%) (Fisher's exact test, p <0.001), do not know risk factors for the development of cervical cancer (Table 2).

A gynaecological examination and Pap screening are performed once a year or as recommended by a gynaecologist by 47 (58.8%) respondents, of which 28 (73.7%) from the Study of Nursing and significantly less, 19 (45.2%) respondents, from Teacher Education Studies (Fisher's exact test, p = 0.012) (Table 3).

Respondents from the Study of Nursing had significantly more sexual partners in the past year (Fisher's exact test, p = 0.015) (Table 4). The number of women who do not tend to have simultaneous relationships with several partners is equal in both groups, 75 (93.8%). In the past year, 1-2 genital infections were experienced by 18 (22.5%) respondents. Only two participants in the total sample had 3-4 infections, both from the Study of Nursing.

When suffering from a genital infection, 53 (66.3%) respondents visit their gynaecologist, 14/80 treat it on their own, 12 (15%) of them wait for the infection to subside on its own, and only 6 (7.5%) inform their partners and are treated together (Table 4).

17 (21.3%) respondents smoke cigarettes every day, 9 (11.3%) smoke sometimes, which is equal in both groups. Significantly more respondents, 21 (50%) of them, from Teacher Education Studies never or rarely use contraception compared to Study of Nursing students (Fisher's exact test, p = 0.020) (Table 5).

Fewer respondents, 19 (45.2%) of them from Teacher Education Studies use a condom, compared to 28 (73.7%) of Study of Nursing respondents (Fisher's exact test, p = 0.0127). Significantly more participants from Teacher Education Studies do not use

| Table 1. Distribution of respondents according to questions regarding knowledge on sexual and health behaviour and by study programme | | | | |
|---|-------------------------------|---|--------------------|--------|
| | | Number (%) of respondents | | |
| Knowledge | Study of Nursing | Teacher Education Studies | Total | P* |
| | First gynaecological exa | mination should be performed befo | ore turning 20. | |
| correct | 35 (92.1) | 36 (85.7) | 71 (88.8) | |
| incorrect | 3 (7.9) | 3 (7.1) | 6 (7.5) | 0.394 |
| l do not know | 0 | 3 (7.1) | 3 (3.8) | |
| 6 | Early start of sexual activit | y is if a person is sexually active b | efore turning 18. | |
| correct | 35 (92.1) | 38 (90.5) | 73 (91.3) | |
| incorrect | 3 (7.9) | 1 (2.4) | 4 (5) | 0.203 |
| l do not know | 0 | 3 (7.1) | 3 (3.8) | |
| | The Pap test is an effect | ive method for early detection of c | ervical cancer. | |
| correct | 38 (100) | 33 (78.6) | 71 (88.8) | |
| incorrect | 0 | 5 (11.9) | 5 (6.3) | 0.005 |
| l do not know | 0 | 4 (9.5) | 4 (5) | |
| | Changing sexual partner | s is a risk factor for cervical cancer | development. | |
| correct | 38 (100) | 25 (59.5) | 63 (78.8) | |
| incorrect | 0 | 7 (16.7) | 7 (8.8) | <0.001 |
| l do not know | 0 | 10 (23.8) | 10 (12.5) | |
| Fir | st pregnancy at an early ag | ge is not a risk factor for cervical ca | ancer development. | |
| correct | 11 (28.9) | 8 (19) | 19 (23.8) | |
| incorrect | 20 (52.6) | 11 (26.2) | 31 (38.8) | 0.003 |
| l do not know | 7 (18.4) | 23 (54.8) | 30 (37.5) | |
| | HPV is one of the | e causes of cervical cancer develop | oment. | |
| correct | 38 (100) | 26 (61.9) | 64 (80) | |
| incorrect | 0 | 2 (4.8) | 2 (2.5) | <0.001 |
| l do not know | 0 | 14 (33.3) | 14 (17.5) | |
| | The HPV vaccine exists an | nd reduces the risk of cervical cance | er development. | |
| correct | 36 (94.7) | 16 (38.1) | 52 (65) | |
| incorrect | 1 (2.6) | 1 (2.4) | 2 (2.5) | <0.001 |
| l do not know | 1 (2.6) | 25 (59.5) | 26 (32.5) | |
| | Frequent gynaecological | infections play a role in cervical ca | ncer incidence. | |
| correct | 26 (68.4) | 20 (47.6) | 46 (57.5) | |
| incorrect | 6 (15.8) | 5 (11.9) | 11 (13.8) | 0.054 |
| l do not know | 6 (15.8) | 17 (40.5) | 23 (28.8) | |
| TOTAL | 38 (100) | 42 (100) | 80 (100) | |
| * Fisher's exact test | | | | |

| Table 2. Distribution of respondents according to questions regarding risk factors by study programme | | | | | |
|--|------------------|----------------------------------|-----------|---------------|--|
| Pisks | Risks | | | | |
| NI3K3 | Study of Nursing | Teacher Education Studies | Total | P | |
| | | Smoking | | | |
| no | 15 (39.5) | 34 (81) | 49 (61.3) | <0.001 | |
| yes | 23 (60.5) | 8 (19) | 31 (38.8) | \0.001 | |
| | | Breastfeeding | | | |
| no | 37 (97.4) | 42 (100) | 79 (98.8) | 0.475 | |
| yes | 1 (2.6) | 0 (0) | 1 (1.3) | 0.475 | |
| | | Multiparas | | | |
| no | 31 (81.6) | 41 (97.6) | 72 (90) | 0.024 | |
| yes | 7 (18.4) | 1 (2.4) | 8 (10) | 0.024 | |
| | | l do not know | | | |
| no | 25 (65.8) | 9 (21.4) | 34 (42.5) | <0.001 | |
| yes | 13 (34.2) | 33 (78.6) | 46 (57.5) | VU.UUI | |
| * Fisher's exact test | | | | | |

| Table 3. I | Distribution of answ | wers by questions on behav | <i>r</i> iour | |
|---------------------------------|--------------------------|------------------------------------|---------------------|------------|
| Pobaviour | | Number (%) of respondents | | • * |
| Benaviour | Study of Nursing | Teacher Education Studies | Total | P |
| Die | l you visit a gynaecolog | ist before your first intercourse? | | |
| l did | 12 (31.6) | 7 (16.7) | 19 (23.8) | 0 1 00† |
| l did not | 26 (68.4) | 35 (83.3) | 61 (76.3) | 0.100. |
| | Your first interco | urse was at the age of: | | |
| 12 to 15 years | 1 (2.6) | 1 (2.4) | 2 (2.5) | |
| 16 to 18 years | 27 (71.1) | 21 (50) | 48 (60) | 0.050 |
| 18 years or older | 10 (26.3) | 15 (35.7) | 25 (31.3) | 0.000 |
| I have not had intercourse | 0 | 5 (11.9) | 5 (6.3) | |
| | l visit my gynaecolo | ogist and do the Pap test: | | |
| once a year, or as recommended | | | | |
| by my gynaecologist | 28 (73.7) | 19 (45.2) | 47 (58.8) | |
| when I remember to do it | 3 (7.9) | 1 (2.4) | 4 (5) | 0.012 |
| when I have problems | 2 (5.3) | 6 (14.3) | 8 (10) | |
| l do not visit one | 5 (13.2) | 16 (38.1) | 21 (26.3) | |
| Have yo | ou been vaccinated agai | nst the Human papillomavirus (HF | PV)? | |
| yes | 0 | 1 (2.4) | 1 (1.3) | 0 338 |
| no | 38 (100) | 41 (97.6) | 79 (98.8) | 0.000 |
| If you were given the c | pportunity to be vaccin | ated against the HPV virus for fre | e, would you do it? | |
| yes | 18 (47.4) | 14 (33.3) | 32 (40) | |
| no | 10 (26.3) | 9 (21.4) | 19 (23.8) | 0.200† |
| I have not thought about it | 10 (26.3) | 19 (45.2) | 29 (36.3) | |
| Total | 38 (100) | 42 (100) | 80 (100) | |
| * Fisher's exact test; †χ² test | | | | |

| Table 4. Distribution of answers by questions on behaviour | | | | | |
|--|--------------------------|------------------------------|----------------|--------------------|--|
| | Nu | mber (%) of responden | ts | | |
| Behaviour | Study of Nursing | Teacher Education Studies | Total | p * | |
| In the previou: | s year, I had the follow | ing number of sexual par | tners: | | |
| l did not have sexual partners | 0 | 6 (14.3) | 6 (7.5) | | |
| 1 - 2 partners | 35 (92.1) | 36 (85.7) | 71 (88.8) | 0.015 | |
| 3 - 4 partners | 1 (2.6) | 0 | 1 (1.3) | 0.015 | |
| 5 and more partners | 2 (5.3) | 0 | 2 (2.5) | | |
| Do you tend to have s | imultaneous sexual rel | ationships with two or m | ore partners? | | |
| yes | 0 | 1 (2.4) | 1 (1.3) | | |
| no | 35 (92.1) | 40 (95.2) | 75 (93.8) | 0.341 | |
| sometimes | 3 (7.9) | 1 (2.4) | 4 (5) | | |
| | In the previous y | rear, I had: | | | |
| 1 - 2 genital infections | 11 (28.9) | 7 (16.7) | 18 (22.5) | | |
| 3 - 4 genital infections | 2 (5.3) | 0 | 2 (2.5) | 0.085 | |
| I did not have any infections | 25 (65.8) | 35 (83.3) | 60 (75) | | |
| Affirmative answers to | o the question that, wh | en they have a genital in | fection, they: | | |
| Visit a gynaecologist | 29 (76.3) | 24 (57.1) | 53 (66.3) | 0.098 ⁺ | |
| Treat it on their own | 7 (18.4) | 7 (16.7) | 14 (17.5) | 0.837† | |
| Wait until it subsides on its own | 3 (7.9) | 9 (21.4) | 12 (15) | 0.121 | |
| Notify the partners and treat it together | 4 (10.5) | 2 (4.8) | 6 (7.5) | 0.416 | |
| TOTAL | 38 (100) | 42 (100) | 80 (100) | | |
| * Fisher's exact test; ' χ^2 test | | | | | |

Table 5. Habits of respondents regarding smoking and the use of contraception

| | N | umber (%) of respondents | 5 | |
|--|------------------|------------------------------|------------|--------|
| Respondents' habits | Study of nursing | Teacher Education Studies | Total | P* |
| | Do yo | ou smoke? | | |
| yes | 8 (21.1) | 9 (21.4) | 17 (21.3) | |
| no | 27 (71.1) | 27 (64.3) | 54 (67.,5) | 0.695† |
| sometimes | 3 (7.9) | 6 (14.3) | 9 (11.3) | |
| | l use co | ntraception. | | |
| Never or rarely | 8 (21.1) | 21 (50) | 29 (36.3) | |
| sometimes | 6 (15.8) | 6 (14.3) | 12 (15) | 0.020 |
| Often and always | 24 (63.2) | 15 (35.7) | 39 (48.8) | |
| TOTAL | 38 (100) | 42 (100) | 80 (100) | |
| * Fisher's exact test; ${}^{\dagger}\!\chi^2$ test | | | | |

any contraception, 10 (23.8%) of them, compared to 2 (5.3%) of Study of Nursing respondents (Fisher's exact test, p = 0.020) (Figure 1).

Our respondents have exhibited almost all risk behaviours.

Statistically significantly more students from Teacher Education Studies had no sexual partners in the last year. Significantly more students from Teacher Education Studies have never had a gynaecological

examination. Regarding contraception, they mostly use *coitus interruptus*.

Higher risk of participants from the Study of Nursing is shown by the fact that in the last year they had five or more partners and that their first sexual intercourse was between the age of 12 and 15.

More of them also smoke, and if they get a gynaecological infection, 9 (20.4%) of them wait until it subsides (Table 6).



Figure 1. Use of contraception by study programme

| Table 6 Distribution of res | nondents according to ris | ky sexual hehaviour l | ny study programme |
|-----------------------------|---------------------------|------------------------|--------------------|
| | | Ky Sekaal Bellavioal i | |

| | | Number (%) of respondents | 5 |
|---|---------------------|------------------------------|-----------|
| Risk | Study of Nursing | Teacher Education Studies | Total |
| Not vaccinated against HPV | 38 (100) | 41 (97.6) | 79 (98.8) |
| Did not visit a gynaecologist before the start of sexual activity | 26 (68.4) | 35 (83.3) | 61 (76.3) |
| Use contraception rarely or never | 8 (21.1) | 21 (50) | 29 (36.3) |
| Do not visit a gynaecologist | 5 (13.2) | 16 (38.1) | 21 (26.3) |
| Contraception - coitus interruptus | 6 (15.8) | 11 (26.2) | 17 (21.3) |
| Smoke | 8 (21.1) | 9 (21.4) | 17 (21.3) |
| Wait until a gynaecological infection subsides on its own | 3 (7.9) | 9 (21.4) | 12 (15) |
| Contraception - none of the above | 2 (5.3) | 10 (23.8) | 12 (15) |
| 5 or more sexual partners in the previous year | 2 (5.3) | 0 | 2 (2.5) |
| First sexual activity at the age between 12 and 15 | 1 (2.6) | 1 (2.4) | 2 (2.5) |
| Simultaneous sexual relationships with two or more partners | 0 | 1 (2.4) | 1(1.3) |

The person they mention as someone they can openly talk to about sexual relationships and sexual issues is a male friend or a female friend for 64 (80%) subjects, significantly more from the Study of Nursing, i.e. 37 (97.4%) (Fisher's exact test, p <0.001).

Another person with whom they can talk openly is their partner, in both study groups equally. The person they believe can help them the least is a family physician. None of the respondents listed their teachers as someone they can openly talk to (Table 7).

Discussion

Since this is a health-related topic, it is not surprising that nursing students have better knowledge, and that the connection between their knowledge and behaviour is optimistic. This difference can be explained by the fact that nurses are educated about health promotion and disease prevention, early screening and disease detection. Sexual health education level is an important prerequisite for long-term health and quality of living, but it is obviously lacking in the area of formal education of non-nursing students.

Participants from Teacher Education Studies know significantly less about the fact that the Pap test is an effective method for early detection of cervical cancer. Also, significantly less of them know that changing sexual partners is a risk factor for cervical cancer. Similar results were obtained in a study on awareness and preventive behaviour related to cervical cancer development on a sample of 205 firstyear students at the University of Mangosuthu in South Africa; 31% of students heard about the Pap test, and a third of them, 33%, knew that the test is used to detect or prevent cervical cancer. Furthermore, one third of respondents, 32%, and more than a quarter of them, 26%, knew about the HPV virus and that a large number of sexual partners was a risk factor for cervical cancer (4).

Participants from Teacher Education Studies know significantly less about risk factors for cervical cancer. Participants from the Study of Nursing gave significantly more correct answers to the claim that HPV is one of the causes of cervical cancer compared to the participants from Teacher Education Studies. Participants from Teacher Education Studies know significantly less that there is the HPV vaccine that reduces the risk of cervical cancer. Participants from the Study of Nursing know significantly more that smoking cigarettes and a larger number of pregnancies are risk factors. In a similar study conducted in Turkey, nursing students received similar results, as much as 90.5% of respondents reported that HPV can cause cervical cancer (5). In a study on the knowledge about risk factors associated with the development of cervical cancer among 140 students in Ghana, the results showed low levels of knowledge about the connection between HPV and cervical cancer, i.e. only 7.9%, or smoking and cervical cancer – only 1% (6). According to the American Cancer Society, women who smoke are about twice as likely to develop cervical cancer (7).

More than half of participants from Teacher Education Studies do not know that early pregnancy is a risk factor for cervical cancer, and some of them disagree with this statement. At the University of *Mangosuthu* in South Africa, among female students who

| Table 7. Distribution of answers to the question regarding the person they can talk to openly about their problems | | | | | |
|---|------------------|-----------------------------------|-----------|--------|--|
| Number (%) of respondents | | | | | |
| Person I can openly talk to | Study of Nursing | Teaching Education Studies | Total | p. | |
| mother | 11 (28.9) | 14 (33.3) | 25 (31.3) | 0.810 | |
| friend | 37 (97.4) | 27 (64.3) | 64 (80) | <0.001 | |
| partner | 24 (63.2) | 27 (64.3) | 51 (63.8) | 0.917 | |
| family physician | 1 (2.6) | 1 (2.4) | 2 (2.5) | 0.728 | |
| gynaecologist | 12 (31.6) | 16 (38.1) | 28 (35) | 0.354 | |
| * Fisher's exact test | | | | | |

were 19.5 years of age, as much as 30.4% stated they had been pregnant (4). British scientists have found that girls who have previously entered sexual intercourse have twice the chance of developing cervical cancer. They came to this conclusion after a survey of 20,000 women (8).

Gynaecologic examinations and Pap tests are performed once a year or as recommended by the gynaecologist in the case of 47 (58.8%) respondents, 28 (73.7%) of which are students of Nursing and significantly less, 19 (45.2%) attending Teacher Education Studies. According to individual reports on general medical examinations during the first year of study for the academic year 2005/2006, the average age of entering into sexual relations was around 17 years (9). What is worrisome is the fact that 48% of sexually active girls did not visit a gynaecologist until a general medical examination (9).

Significantly more sexual partners in the past year were reported by participants studying nursing. A similar study was conducted by Denny-Smith on a sample of 240 nursing students and showed that students participate in high-risk sexual behaviours, but unlike our respondents, they also showed a low level of knowledge (10). Such a situation can be explained by earlier physical and sexual maturity, longer education, and later marriage arrangements. Curiosity, ignorance, peer pressure, emotional immaturity with sexual intercourse etc. lead young people to risky sexual behaviour (11).

Significantly more students from Teacher Education Studies never or rarely use contraception compared to participants from the Study of Nursing. Fewer participants from Teacher Education Studies use a condom. These figures are lower than the data obtained at the University of Mangosuthu in South Africa where as much as 78% of students said they used condoms, and 56% of them stated that they used condoms during every sexual relationship (4). Significantly, none of these contraceptive methods are used by the students of Teacher Education Studies. According to individual reports on general medical examinations during the first year of study for the academic year 2005/2006, the use of condoms among the student population is unsatisfactory (9). Of those who are sexually active, up to 27% of girls stated that they rarely use condoms or do not use them at all (9).

The person who participants listed as someone they can openly talk to about sexual relations and sexual problems is a friend, significantly more from the Study of Nursing. Young people receive health information from formal (school, books, doctors), but also from informal (friends, family, magazines, media, internet) sources (9). In RAR (Rapid Assessment and Response) research conducted among the most vulnerable groups of young people in 2002, friends are listed at the top, followed by the media, and only then by school and family (11). Janković has analysed students' attitudes and has concluded that it is sometimes unpleasant for young people to talk to their parents, even though parents and experts in schools are believed to be the best source of information (12).

We consider that the shortcoming of this study is a small number of respondents, and that a larger number of respondents should be involved in future research.

Conclusions

This research shows that there is a significant difference between the knowledge and behaviour of female students who attend University Undergraduate Study of Nursing and female students of Integrated Undergraduate and Graduate Five-Year University Class Teacher Education Studies. Thus, the hypothesis is confirmed.

In this study, we can see the lack of information and education, especially of Teacher Education Studies students and that education on sexual health and responsible sexual behaviours is very much needed. The preservation of reproductive health of young people is an important factor not only for their own well-being, but also for the progress of the whole society. Careless and irresponsible sexual behaviour of young people can have direct, but also long-term consequences. This study clearly shows that there is room for the necessary interventions in the work of all health care professionals and in health education, the fundamental activity of primary prevention.

Health education should provide science-based information and facts, and influence attitudes and values.

Schools have a central role, and health education is an essential part of a comprehensive program. However, behaviours cannot change without the involvement of families and wider community.

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ZNANJE I PONAŠANJE STUDENTICA VEZANO UZ PREVENCIJU RAKA VRATA MATERNICE

Sažetak

Uvod. Rak vrata maternice u Hrvatskoj se nalazi na osmom mjestu najčešćih sijela raka u ženske populacije sa stopom učestalosti od 13,2 na 100 000, što nije zadovoljavajuće u usporedbi s drugim zemljama. Cilj ovog istraživanja bio je utvrditi postoji li razlika u znanju i ponašanju studentica u vezi s čimbenicima rizika koji utječu na pojavnost raka vrata maternice s obzirom na vrstu studija.

Ispitanici i metode. Presječenom studijom obuhvaćene su studentice sveučilišnog preddiplomskog studija sestrinstva i studentice integriranog preddiplomskog i diplomskog sveučilišnog učiteljskog studija. U istraživanju je sudjelovalo 80 ispitanica prosječne životne dobi 22 godine. Ispitivanje je provedeno anonimnim anketnim upitnikom koji je sadržavao 23 pitanja koja su se odnosila na čimbenike rizika koji utječu na pojavnost raka vrata maternice.

Rezultati. Ispitanice s Učiteljskog fakulteta u znatno većem broju odgovaraju da ne poznaju čimbenike rizika za nastanak raka vrata maternice, njih 33 (78,6 %) (Fisherov egzaktni test, p < 0,001). Ginekološke preglede i uzimanje PAPA testa testa 47 (58,8 %) ispitanica obavlja jednom godišnje ili po preporuci ginekologa, od čega 28 (73,7 %) sa studija sestrinstva i znatno manje, 19 (45,2 %), s Učiteljskog fakulteta (Fisherov egzaktni test, p = 0,012). Manje ispitanica, njih 19 (45,2 %) s učiteljskog studija upotrebljava kondom, u usporedbi sa 28 (73,7%) studentica studija sestrinstva (Fisherov egzaktni test, p = 0,0127). **Zaključak.** Iz provedenog istraživanja možemo zaključiti da između studentica studija sestrinstva i studentica učiteljskog studija postoji razlika u znanju i ponašanju povezanom s prevencijom raka vrata maternice.

Ključne riječi: prevencija raka vrata maternice, rizični čimbenici i rak vrata maternice

Attitudes and Opinions of Community Health Nurses on Nursing Discharge Summaries and Cooperation with Hospital Nurses

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Abstract

Aim: To examine the attitudes and opinions of community health nurses on nursing discharge summaries (NDS) as a form of cooperation with hospital nurses in terms of improving mutual cooperation.

Methods: A total of 27 community health nurses employed at two health care centres in the City of Zagreb participated in the study. Four focus group discussions were held, led by a moderator and observed by a researcher. The participants were given statements and open-ended questions which allowed them to freely express their personal views, thoughts, opinions and doubts. The data was analysed in accordance with the principles of one of the most influential models of qualitative data analysis of the authors Glaser and Strauss.

Results: Four main topics were derived from data analysis: 1) knowledge of NDS; 2) features of existing NDS; 3) elements of cooperation between community health nurses and hospital nurses via existing NDS; 4) recommendations for the improvement of NDS.

Conclusion: Routine issuance of NDS for each patient indicating the continuation of nursing care after being discharged contributes to improved cooperation between nurses at different nursing care levels, emphasizes the role of the nurse in cost-effective planning and nursing care and, most importantly, ensures cost-effective, continuous, holistic and quality nursing care for each individual patient.

Introduction

According to the Nursing Act, one of the duties of a nurse is to keep nursing documentation that will record all procedures performed during 24 hours (1).

The purpose of keeping nursing documentation is manifold. It is a source of information on the basis of which it is possible to acquire results useful for the development of nursing practice through study. Furthermore, it ensures legal protection – a document that verifies facts and assertions in the case of a dispute or disagreement; it enables the tracking of expenses according to the efficiency of care and is one of the standards in nursing internationally (2).

The process of nursing documentation implementation in the Republic of Croatia began in 2011 when the Ordinance on nursing documentation in hospitals was issued, determining the contents and the forms for nursing documentation in hospitals. According to the Ordinance, the NDS form is an obligatory part of nursing documentation and is to be written for patients that need a continuation of nursing care after discharge from hospital (3). NDS are an important part of nursing documentation and are meant to improve how community health nurses are informed on continuing care, not just for patients that are being discharged from hospital, but also for the healthy population of community health care users, e.g. pregnant women who need breastfeeding training or patients that need education on health issues.

Despite the aforementioned advantages of working with NDS, the results of current studies indicate the need for improvement of cooperation between hospital and community health nurses using NDS. Bjuresäter and collaborators in the qualitative study of experiences by community health nurses in Sweden determined the need for improving the cooperation and communication between nurses in hospitals and community services (4). Hesselink and collaborators in their study in the Netherlands also confirmed certain shortcomings in the collaboration between hospital and community health nurses through NDS, where community health nurses asserted that important patient discharge information would often be omitted or would be incomplete, unclear or delaved (5).

Previous experiences with NDS in our country indicate that this way of communication and cooperation between nurses at the primary, secondary and tertiary health protection levels is still inadequately developed and is still, despite recommendations, not the usual way of their cooperation. Since no relevant literature exists so far and studies in this area are rare in the Republic of Croatia, this qualitative study was carried out to examine the attitudes and opinions of community health nurses about the existing nursing discharge summaries and their suggestions for their improvement.

Methods

After obtaining the permission for the study from the ethics commissions of the Zagreb-Centar and Zagreb-Zapad health care centres, head nurses of these institutions were contacted by telephone with the request to recruit community health nurses for the focus groups.

The letter of invitation that contained information on the study was sent to a total of 29 community health nurses, with 27 accepting the invitation (*response rate* 93.1%). Community health nurses willing to take part in the study were divided into 4 focus groups, with 6 community health nurses in the first and third focus group, 7 in the second focus group and 8 community health nurses in the fourth focus group. The selection criterion for the focus group participants was that the community health nurses willing to take part in the study had experience with NDS in their previous work. Every focus group met only once, with group discussions lasting between 90 and 120 minutes.

Among the 27 community health nurses that responded, all were female, aged from 23 to 64. Length of service was under 10 years in case of 16 of 27 community health nurses, whereas 11 had worked longer than 10 years. Of the 27 participating community health nurses, 4 held a master's degree, while others held bachelor's degrees.

Focus groups

All four focus group discussions were managed by the same moderator and were observed by a researcher. The moderator was a university educated woman with a background in medicine and experience in moderating focus groups. The participants were notified that the purpose of the focus group was to encourage interaction between participants and that they were completely free to express their personal views, thoughts, opinions and concerns within the scope of the topic. Focus group sessions were held separately in the premises of the Zagreb-Centar and Zagreb-Zapad health care centres over a period of three months.

Data analysis

Focus group discussions were recorded using a voice recorder, and a transcript was written subsequently. The data was analysed through qualitative analysis based on the principles of the grounded theory of Glaser and Strauss - one of the most influential models in qualitative data analysis. The basic premise of the grounded theory is to draw key topics from the gathered data, and not to place the data in pre-established categories. Thus, one starts from an individual case, an incident or occurrence, and then gradually develops and synthesizes abstract conceptual categories, trying to interpret the data and identify patterns of behaviour among them. The final theory includes a set of developed concepts, connected by defined relations that together form a framework for the description or prediction of phenomena.

For the purpose of correct and complete text content (and context) understanding, a meticulous data analysis was performed word by word and line by line aimed at achieving credibility and avoidance of researcher bias or data criticism (7). Three main coding procedures were performed: open, axial and selective coding. Among these three types of procedures, no clear demarcation line had been set, but they were continuously combined. Through final analysis, these analytical procedures were set in a reference frame of the conditional matrix.

Data analysis was performed by two researchers after every focus group session, first independently, then in agreement with each other, according to the codes, categories, concepts and resulting theories. The analysis included the observer's feedback, since he was present at every discussion, listening and watching attentively.

Results

Through qualitative analysis of the data gathered by the focus group method, four main topics and explanatory models were derived: 1) knowledge of NDS; 2) features of existing NDS; 3) elements of cooperation between community health nurses and hospital nurses via existing NDS; 4) recommendations for the improvement of NDS.

Topic 1) Knowledge of NDS

Although the majority of community health nurses had experience with NDS in their work, these NDS were written mostly for patients with diabetes, chronic wounds, as well as pregnant women and newborn babies. NDS in question were mostly written at patients' discharge from hospital (Clinical hospital "Sveti Duh", Clinical hospital "Sestre Milosrdnice", Clinical hospital "Merkur", as well as for chronic patients from the Special Hospital for Pulmonary Diseases). Although NDS are not a standard working procedure in these health care institutions, all community health nurses agreed that NDS were necessary and cited their positive role in ensuring nursing care for patients after their discharge from hospital, either ensuring easier planning for nursing care procedures or continuity of nursing care.

Quotes from community health nurses:

"We either don't get them, or they are inadequate, sometimes the data is incorrect, or worst of all we don't get them..." (Community health nurse 8, FG 2).

"I also had to deal with these discharge summaries from Vuk Vrhovac clinic, but that is a project, not routine practice that... it's about diabetics."

(Community health nurse 12, FG 2).

Topic 2) Features of existing NDS

Most community health nurses participating in the study pointed out the non-uniformity of received NDS when it comes to forms, appropriateness of content, legibility or correctness of data. Some NDS were written electronically, had adequate content that enabled further nursing care planning and were legible. They contained detailed nursing diagnoses, a description of nursing care procedures performed in hospital and recommendations for continuing nursing care for every patient. In contrast to the above, some NDS mostly contained content that was inadequate for further nursing care planning. Furthermore, NDS were partly handwritten (illegible), incomplete and part of the data was incorrect. For example, some postnatal NDS written for mothers who had recently given birth (puerpera) and newborns claimed that the mother was breastfeeding, but at the mother's home it was determined that the breastfeeding process had not been established during hospital stay. Also, in some NDS the presence of pressure ulcers in patients was not recorded, although the patients were discharged with dressings on the wounds.

And finally, the experiences of community health nurses point to the fact that the NDS form is not uniform according to the recommendations of the Croatian Nursing Council (HKMS), but that every ward had adapted the NDS form to its work practice and the needs of their patients' nursing care. However, community health nurses pointed out that certain elements of the form were essential for organising and planning of nursing care - not the forms' layout. The form should specify the nursing care provided in hospital, patient's response to the care, when a wound dressing was changed, when a urinary catheter was changed, etc. Therefore, the layout of the form itself, according to the opinions of community health nurses in focus group discussions, is not essential for nursing care planning. What is essential are its contents.

Quotes from community health nurses:

"My only objection is that the handwritten parts that were photocopied are illegible." (Community health nurse 12, FG 2)

"... our experiences are ... different ... in most cases there is no pressure ulcer description ... nor does it mention how it was treated, when it developed, how old the wound is, was the patient admitted to the hospital with a pressure ulcer, did it develop in hospital, which factors contributed to its development, etc."

(Community health nurse 5, FG 1).

Topic 3) Elements of cooperation between community health nurses and hospital nurses via existing NDS

Positive elements of cooperation

All community health nurses have unequivocally pointed out the positive role of NDS in planning and organising nursing care. The following data acquired through NDS was especially emphasized as being useful in the further organising and planning of nursing care: general personal data of the patient (place of residence, phone number, family characteristics, functional and social status), nursing care/ procedures provided in hospital, the patient's current health status, current nursing diagnosis at discharge from hospital, as well as recommendations for the continuation of nursing care and materials needed for nursing care for every patient.

The importance of timely data acquisition through NDS was pointed out several times as being an important factor in time management. The usefulness of sending an e-mail to the head nurse of the health care centre was emphasized, with the head nurse then forwarding the e-mail to the community health nurses according to the patient's place of residence.

According to the statements of community health nurses, the issuance of NDS improves the quality of nursing care from the aspect of the patient because it decreases the possibility of a longer break in nursing care after hospital discharge (i.e. the patient waits less for the continuation of nursing care), which, along with improved information transfer to the community health nurse via NDS (information about the patient and the performed/planned nursing care procedures) contributes to greater patient satisfaction and lessens the care recipient's feeling of being lost in the health care system.

Routine issuance of NDS for every patient that is in need of further nursing care after discharge definitely contributes to the professionalization of nursing by emphasizing the importance and indisputability of the place and role of the nurse in cost-effective planning and organising and consequentially ensures a cost-effective, continuous, holistic and good quality nursing care for every patient.

Negative elements of cooperation

The fact that the issuance of NDS at discharge of patients requiring further nursing care is still not done routinely negatively affects its implementation. In situations like these, it will surely take the community health nurse a longer time to gather information about the patient's state and nursing care procedures performed in hospital, as well as to plan and organise nursing care. In some cases, even the cost of care increases (e.g. choosing the dressing for a wound).

In some of the received NDS, it was noticed that data was inadequate – either incomplete, incorrect or not up-to-date. For example, a chronic wound a patient already had at discharge from hospital was not registered, or in another instance it was stated a mother was breastfeeding when in fact the breastfeeding procedure was not established. Sometimes the patient's personal data was incorrect. Some NDS never reach the end user – the community health nurse – or they arrive too late, when nursing care has already been organized. Reasons for that include late issuance of NDS by the hospital, keeping NDS in the patient's medical records by the family doctor or misplacement of NDS by the patient.

Quotes from community health nurses:

"My experiences are positive... I got exactly twenty NDS for a patient... Yes, before my first visit, I actually saw everything, the complete picture and that is what I really found in the field." (Community health nurse 7, FG 2).

"Discharge summaries arrive, discharge summaries are being sent, but they get lost on the way. I have here an extensive discharge summary from 2014, issued by the University Clinical Centre Zagreb, and it surely isn't an isolated case, colleagues write summaries for every patient, but what happens later...?"

(Community health nurse 20, FG 4).

Topic 4) Recommendations for the improvement of NDS

All community health nurses pointed out the benefits of using NDS and stated that such a summary should be sent for every patient who needs further nursing care. In such cases, it would show good nursing practice.

Since different forms of NDS are being used, nurses stated it would be beneficial to create a form that

would contain the following elements: personal data and social status of the patient, nursing anamnesis, description of performed nursing procedures, diagnosis according to ICD (10th revision) and recommended pharmacotherapy, performed nursing care procedures, current nursing diagnosis after discharge and recommended nursing care after discharge.

Regarding the observed obstacles to the availability of NDS to community health nurses, the need for an increase in its availability was established. It would be useful to point out to the patient and to indicate in the NDS header that the document was intended for the community health nurse ("att. community health nurse"). Furthermore, to make distribution of NDS quicker, community health nurses would prefer that they be sent by e-mail to the head nurse of the health care centre, who would then forward them to community health nurses in the field, according to the patient's place of residence.

"... It should always state... 'Please hand over to the community health nurse or the community health care service' ... in bigger letters so that the doctor also ... when he sees it, hands it over to us... or 'Please deliver to the community health nurse or something like that, until it becomes standard practice."

(Community health nurse 5, FG 1).

Discussion

The results of this study suggest inadequate cooperation of hospital and community health nurses through NDS, which confirms the hypothesis of this study. Taking into account that NDS are an obligatory part of nursing documentation and that in the Republic of Croatia there is a legal obligation to write nursing documentation, as stated before, its importance is indisputable. Since according to this study NDS are not a routine part of nursing practice in Croatia in most cases, but are instead issued only for a certain category of patients and not for all patients who need continuation of health care, and furthermore that they are issued only by some health care institutions, one should question whether nurses are sufficiently acquainted with the legal framework for nursing documentation in the Republic of Croatia. In her research on the introduction of nursing documentation into the IT health care system and its influence on the quality of nursing care, the author Ljubičić also determined that a high percentage (43% of a total of 217 study participants) of nurses was not informed about the legal framework regulating nursing documentation in the Republic of Croatia (8).

Since nursing documentation in the Republic of Croatia has only partially been implemented electronically on all levels of health care, there are cases where NDS are handwritten, illegible or partially incorrect. NDS written electronically have the advantage of better legibility and accessibility (and can be sent by e-mail), and as such enable simpler archiving with the rest of the patient's documentation after discharge from hospital. Kergoat and collaborators also point out the mentioned benefits of informatisation in health care (9). According to this study, some of NDS were written electronically, had content that enabled further planning of nursing care and were detailed and legible. They contained detailed nursing diagnoses, nursing care procedures performed in hospital and recommendations for continuing nursing care for every patient. This points not just to the advantages of writing NDS electronically because of better legibility, but also to the benefits when filling out NDS, in the sense that a single form for the discharge summary exists in the hospital IT system, as recommended by the Croatian Nursing Council (HKMS). This promotes a uniformity of documentation at an institutional level.

This study shows that there are several forms of NDS in use that are adapted to the institutions that issue them, as well as to the needs of patients who need nursing care after discharge from hospital. However, given the inadequate issuance of NDS that are essential for the organisation and planning of nursing care, community health nurses have pointed out that individual parts contained in the form are more important than the layout of the form. They mentioned the importance of the specification of nursing care provided in hospital, the patient's response to it, when a wound dressing was changed, which one was used, etc. Many studies were conducted for the purpose of improving discharge summaries. In their study conducted in Canada, Kergoat and collaborators concluded that discharge summaries should be adapted in order to improve the quality of informa-

tion transfer from the hospital to the community, especially in the case of senior patients (9). NDS are an important part of nursing documentation that should contain not only correct and clear information on a patient after discharge from hospital, but should also reach the end user on time. The results of this study show that some NDS do not reach their end users (community health nurses) on time - they arrive when nursing care has already been organized. Other studies also point out the importance of the timely delivery of this document. In his paper on attitudes, behaviour and obstacles for nurses while planning patient discharge, Graham states that the handover of nursing documentation from the hospital is often not done on time so as to enable the further organisation of patient care (10).

Unlike the aforementioned, there is good cooperation between nurses from some institutions in the Republic of Croatia through NDS - i.e. the information reaches the end user (in this case, the community health nurse) on time. A case was mentioned when NDS are sent by e-mail to head nurses of health care centres who forward them to community health nurses according to the patient's place of residence. The importance of timely data acquisition through NDS was pointed out several times as being an important factor in appropriate time management and choosing the most appropriate nursing care procedure after discharge, thus ensuring continuity in the process of providing nursing care to the patient. In their study on reliability, efficiency, accuracy and timeliness of information transfer between the hospital and the community, Wilson and collaborators state that email can ensure timely, safe and efficient communication and transfer of important data (11).

According to the results of this study, inadequacy of data in parts of NDS was noticed regarding accuracy, clarity and completeness. Community health nurses note the example of a mother who had recently given birth and for whom it was specified that she was breastfeeding, though it was subsequently found that the breastfeeding process was not established during the mother's hospital stay. Others quote the example of patients with pressure ulcers and dressed wounds at discharge from hospital that were not specified in NDS. The quoted examples point to the fact that it would be necessary to analyse the aforementioned poor nurse knowledge about the legal framework for nursing documentation regarding data inaccuracy in NDS. Documenting procedures from the field of nursing care should not be a side activity for nurses, but an obligation that is fulfilled responsibly and carefully. Other research also notes insufficient transfer of information from the hospital to the community through documentation, citing inadequate, inaccurate, unclear and incomplete data (5, 12, 13, 14, 15).

All community health nurses have pointed out the benefits of using NDS in planning and organising nursing care. Benefits of improved communication between hospital and community health nurses through NDS were especially emphasized, e.g. greater availability and insight into patient records, timely data transfer and better quality information access for the community health nurse. Iveta and collaborators also pointed out the indisputability of NDS in communication improvement (16).

Routine issuance of NDS for every patient that is in need of further nursing care after discharge definitely contributes to the professionalization of nursing, by emphasizing the importance and indisputability of the place and role of the nurse in cost-effective planning and organising and consequentially ensures a cost-effective, continuous, holistic and good quality nursing care for every patient. According to Kalauz, some theoreticians find that for a profession it is crucial to have a clearly articulated identity and an understandable, acceptable and socially accepted role. In spite of that, the description of work duties for nurses in the context of health care institutions is often unclear, which does not support the development of nurses' professional identity. Also, management structures are not making the development of nursing identity an integral part of the identity of the institution (17). It is widely recognised that nursing documentation and documenting nursing care is a unique field of work for the nurse. For that reason, NDS should become a standard in nursing practice, become a daily work routine and be accepted as a unique document that only a nurse can issue and thus become recognized in society as the document of a profession - the profession of nursing, because the recognition of the nursing profession is currently of crucial importance in the Republic of Croatia.

Conclusion

 In Croatia, it is still not routine to write NDS for every patient requiring further nursing care, and NDS are issued only for certain groups of patients in most cases (diabetics, patients with chronic wounds, new mothers and newborns); it is common in certain wards in certain hospitals as part of separate projects and not a standard working procedure in these institutions.

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- Most community health nurses pointed out that NDS are not uniform regarding the layout of the form, appropriateness of content, legibility and accuracy of data.
- 3. Positive elements of cooperation between community health nurses with hospital nurses through existing NDS are as follows: timely transfer of information about the patient through NDS (by e-mail), timely information transfer to the community health nurse contributes to patient satisfaction, routine issuance of NDS contributes to the professionalization of the nursing profession.
- Negative elements of cooperation between community health nurses and hospital nurses through existing NDS are as follows: non-existence of routine issuance of NDS in nursing practice, inadequate data (incorrect, incomplete, outdated).
- 5. Recommendations for NDS improvement are as follows: appropriate, accurate, up-to-date data and faster NDS distribution by e-mail.
- 6. A consensus was reached among community health nurses about the need for the existence of NDS. They cite its positive role in ensuring nursing care for patients after they are discharged from hospital, both ensuring easier planning of nursing care procedures and continuity of nursing care. Therefore, NDS should be issued for every patient who requires a continuation of nursing care. In these cases, NDS are an indicator of good nursing practice.

Limitations

Some participants (community health nurses) in the focus group were acquainted with each other. Future research should exclude the possibility of participants being acquainted with each other. There is need for this topic to also be studied in other cities in Croatia.

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STAVOVI I MIŠLJENJA PATRONAŽNIH MEDICINSKIH SESTARA O OTPUSNOM PISMU ZDRAVSTVENE NJEGE I SURADNJI S BOLNIČKIM MEDICINSKIM SESTRAMA

Sažetak

Cilj. Istražiti mišljenja i stajališta patronažnih sestara o otpusnom pismu zdravstvene njege (OPZNJ) kao obliku suradnje s bolničkim medicinskim sestrama u svrhu unaprjeđenja njihove suradnje.

Metode. Ukupno je sudjelovalo 27 patronažnih sestara zaposlenih u dva doma zdravlja u gradu Zagrebu. Održane su četiri rasprave u fokusnoj skupini, uz vodstvo moderatora te opservaciju istraživača. Pred sudionike su bile iznesene izjave i pitanja otvorenog tipa, na koja su bili potpuno slobodni izraziti svoje osobne poglede, misli, stajališta i brige. Podaci su analizirani po načelima jednog od najutjecajnijih modela kvalitativne analize podataka, autora Glasera i Straussa.

Rezultati. Iz analize podataka proizašle su četiri glavne teme: 1) poznavanje OPZNJ-a; 2) obilježja postojećeg OPZNJ-a; 3) elementi suradnje patronažnih sestara s bolničkim medicinskim sestrama putem postojećeg OPZNJ-a; 4) preporuke za unaprjeđenje OPZNJ-a.

Zaključak. Rutinsko izdavanje OPZNJ-a za svakog bolesnika u kojeg je indiciran nastavak provođenja zdravstvene njege nakon otpusta pridonosi boljoj suradnji medicinskih sestara na različitim razinama zdravstvene skrbi, ističe ulogu medicinske sestre u racionalnom planiranju i organizaciji skrbi te, što je najvažnije, osigurava racionalnu, neprekinutu, holističku i kvalitetnu zdravstvenu njegu svakoga pojedinog bolesnika.

Ključne riječi: patronažne sestre, otpusno pismo zdravstvene njege

Nursing Students Opinion on Knowledge Need for Nursing Practice and Self Assessment of Adopted Competencies at the End of an Undergraduate Study Programme

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Abstract

Aim. The aims of this research were to obtain students' opinions on the necessary knowledge for performing nursing practice listed in EU directives, student self-assessments on adopted competencies and students' opinions on internships. This research was undertaken to determine whether there are differences in student responses depending on their previous education.

Methods. The final study included 61 third-year nursing students. Students voluntarily and anony-mously completed a questionnaire that included information such as demographic data, learning areas according to Directive 2005/36/EC and competencies under Directive 2013/55/EU, and questions related to the need and length of internships at the end of the nursing programme.

Results. At the end of the study, students considered nursing knowledge to be the most significant knowledge (M=4.74), followed by communication skills (M=4.49), and clinical and basic medical sciences. Students rated research knowledge in nursing as the least significant. Students who had not completed secondary nursing school gave statistically significant higher estimates related to the significance of required knowledge (p=0.035). Students were cautious in their self-assessments of the acquired competencies of nursing practice. They rated their ability to empower individuals, families and groups towards healthy lifestyles and self-care the highest; and their ability to independently initiate

life-preserving immediate measures and to carry out measures in crises and disaster situations the lowest. Most of the respondents (74.6%) stated that an internship was required after graduation, and that it should last up to 6 months. Students who responded that an internship was required had higher estimates related to the necessary knowledge for performing a nursing profession (p=0.033).

Conclusion. Employment in the health care system is stressful and challenging for a newly graduated nurse. To facilitate the transition from the role of a student to the role of a nurse, the cooperation of the education system and the health care system is necessary.

Introduction

Nurses represent the largest group of healthcare workers in the Republic of Croatia, and their primary activity is nursing care, which is often a complex and high-performing job requiring specific knowledge and skills. Most of the nurses (N=30.413) are employed in the health care system and according to the data of the Croatian Health Statistic Yearbook for 2016, they are the largest group of professional employees among healthcare workers and associates (44.4%) (1). Most of the graduate nursing students are employed in the health care system. The health care system seeks out nurses who are competent specialists who can safely provide holistic care to different patient groups.

A large number of students enrol in nursing studies for reasons such as the desire for human contact, the ability to help others, the feeling of doing something useful, and job security (2-7). Another reason for choosing nursing as a profession is previous contact with nurses (5, 8, 9). Many students who are beginning nursing programmes have an idealistic picture of nursing (10, 11, 12).

Nursing education

Today, nursing education in the Republic of Croatia is conducted on two levels - secondary and tertiary education. To equalize the quality of nursing education and to ensure the quality of nursing care provided by nurses, nursing education is regulated by a number of regulations. The minimum standards for nursing education at the EU level are set out in Directives 2005/36/EC (13) and 2013/55/EU (14), which define the minimum standards for the content and duration of education, and the directive recommendations are incorporated into national laws.

With the aim of raising the level of knowledge and the scope of competencies acquired, to ensure the provision of better quality nursing care, beginning in 1999, three major reforms of higher nursing education in Croatia have been implemented, as well as a number of minor changes in curricula at individual higher education institutions.

In 1999, the length of nursing programmes was extended from two to three years, and the study programme places greater emphasis on nursing care.

The introduction of the Bologna process has led to changes in the system of nursing education, and since 2005, a newly implemented nursing education curriculum has been consistent with the recommendations of the World Health Organization on nursing and midwifery education (15) and the recommendations of the European Union contained in Directives 77/452/EEC (16), 77/453/EEC (17) and the Munich Declaration (18).

The University of Applied Health Sciences began teaching specialist graduate professional studies in Public Health, Management in Nursing, and from the academic year 2009/10, Psychiatric Nursing and Clinical Nursing has been offered. Since 2010, after completing a three-year undergraduate study, students can continue their studies at two-year university graduate studies at School of Medicine in Osijek or Zagreb, and at Faculty of Health Studies Rijeka, and at nursing graduate studies in Split and Zadar.

Changes in nursing education in Western European countries due to social change, health care reform, and nursing professionalization (19) have impacted the higher education of nurses in Croatia. Davies called the Bologna process the silent revolution in higher nursing education in Europe. Harmonization with the Bologna Declaration has led to significant changes and begun to standardize nursing education across Europe (20).

By including Croatia in the European Union, nursing programmes are further aligned with nursing education recommendations at the level of individual higher education institutions. At the national level, to harmonize nursing education in the Republic of Croatia in 2014, a bachelor's degree programme was created in 2014, called Core Curriculum. This study programme is in compliance with the provisions of the Directives 2005/36/EC and Directives 2013/55/ EU and contains a common part of compulsory courses that carry 158 ECTS of 180 ECTS credits, while elective courses have been proposed by each higher education institution. Beginning in the academic year 2015/16, all nursing undergraduate students in Croatia are taught compulsory courses by a harmonized programme (21).

The European Union directives mention nursing, basic sciences and social sciences as the main areas of learning. In addition to the contents of the programme directive, education is conducted through theoretical and clinical teaching of at least 4600 hours of learning. In this 4600 hours, theoretical training should cover at least one third of the minimum duration of training, and clinical training at least one-half of the minimum duration of training (13).

Clinical training implies learning as a part of a team in direct contact with healthy or sick individuals and/ or the community, including how to organize, provide and evaluate the necessary comprehensive nursing care based on the knowledge and skills they have gained. Nursing attendees learn not only how to work as part of a team, but how to lead the team, and how to organize overall nursing care, including health education for individuals and small groups within the health care system or in the community (13).

In Directive 2013/55/EU, emphasis is placed on acquiring competencies, and by completing the studies, the student should adopt the following competencies (14):

- competence to independently diagnose the nursing care required using current theoretical and clinical knowledge and to plan, organize and implement nursing care when treating patients on the basis of the acquired knowledge and skills;
- competence to work together effectively with other actors in the health sector, including participation in the practical training of health personnel on the basis of the acquired knowledge and skills;
- competence to empower individuals, families and groups toward healthy lifestyles and self-care;

- competence to independently initiate life-preserving immediate measures and to carry out measures in crises and disaster situations;
- competence to independently give advice to, instruct and support persons needing care and their attachment figures;
- competence to independently assure the quality of and to evaluate, nursing care;
- competence to comprehensively communicate professionally and to cooperate with members of other professions in the health sector;
- competence to analyse the care quality to improve his own professional practice as a nurse responsible for general care.

Students enrolled after July 1 2013 or after their country joins the European Union who complete the nursing study programme consistent with the recommendations of the directive are no longer required to perform internships. Immediately after the completion of their studies, they receive an Independent Work Permit (license).

Prior to this change, after completing the nursing programme, according to the Law on Health Care (22) and the Ordinance on the Internships of Health Professionals (23), students completed one-year internships that enabled them to acquire knowledge, skills and further preparation for independent work. After their internships, the nurses took the state exam, and after having successfully passed the exam, they were granted a license to work as nurses.

During the programme, through the process of professional socialization, students develop new knowledge and skills, attitudes, behaviours, values and ethical standards that become part of their professional identity. The most important elements for professional socialization are the education (teaching) and the observation of the behaviours of other nurses.

A great deal of professional socialization occurs when students have mentors in clinical practice and when students attend clinical practice. Gray and Smith describe the phases through which students pass through clinical practice (24). Before they begin clinical practice, students experience anxiety; during practice they encounter the reality of the workplace and experience cultural shock. During this phase, students are dealing with reality; they adopt routines and adapt to realistic situations. Then, the phase in which students begin to feel like nurses, take on more tasks and more responsibilities, develop a holistic approach to the patient, assess, plan, implement and evaluate the nursing care performed. Anxiety occurs again at the end of the study (24). Anxiety at the end of the study is related to transitioning from a student to a nurse and taking full responsibility for the tasks performed. Students may be afraid of the consequences of a mistake, some of the students claim to have theoretical knowledge, but it is difficult to choose the best intervention and apply it (25).

Patricia Benner studied the transition from novice to expert professional and described the process of acquiring nursing skills in the following five stages: novice, advanced beginner, competent practitioner, proficient practitioner, and expert practitioner (26). Research suggests that a newly graduated nurse should be considered an advanced beginner (27), and employers would like to hire a least competent practitioner.

After graduation, the transition from a student to a newly graduated nurse is followed. In literature, this transition is described as a reality shock (28) or a transition shock (29, 30). A transition shock is the result of a change from the well-known role of a student to the lesser-known professional role of a nurse. Newly graduated nurses often describe feelings of anxiety, insecurity, inadequacy and instability. Their primary fears are that they will be declared clinically incompetent, will not provide safe care, will inadvertently injure the patient, or will not be able to cope with their designated roles and responsibilities (29,30).

Transition shock may be potentially dangerous in situations where there is a disparity between the expectations of a newly graduated nurse and the realities of the job, to an extent that the nurse quits nursing (31). To ease transition shock in work organizations, supportive mentoring strategies have been developed for new nurses to increase their readiness to work, reduce the effects of the reality shock and reduce the resignation of the profession (31).

The aims of this research were to obtain students' opinions on the knowledge necessary for performing nursing consistent with EU directives, students' self-assessments on adopted competencies and students' opinion on internships. This research aimed to determine whether there are differences in student responses depending on previous education.

Methods

Study design

A cross - sectional study was conducted on full time students in their final year of nursing studies.

Examinees

The study was conducted utilizing full time nursing students at the University of Applied Health Sciences, who attended the third (final) year of study in 2017.

Of the 103 enrolled students in the third year of study, the questionnaire was completed by 61 students (59%). Most students were women 91.8% (N=56). The age ranged from 21 to 40 years, and the average age was M=22.89 (SD=2.887). At the time of the survey, none of the respondents were employed as nurses. Most respondents had completed gymnasiums 54.1% (N=33), high school for nurses was completed by 9 respondents (14.8%), and 19 students completed other secondary school.

Data collection and instrument

Students voluntarily filled out an anonymous questionnaire that included demographic data, learning areas according to Directive 2005/36/EC and competencies under Directive 2013/55/EU, and questions related to the need and duration of internships at the end of the study.

Data were collected during May and June 2017, during the classes of final semester of the programme. The questionnaires were delivered to all the students who attended classes in several different terms.

The students answered the questions by completing the scale with responses ranging from 1 to 5 regarding to what extent they consider the knowledge specified in the directive necessary for performing nursing practice (1 indicates strongly disagree and 5 fully agree) and to what extent they are capable of performing a particular group of competencies (1 represents not capable, 5 represents fully capable). When answering questions about the internship, students chose one of the answers offered.

Ethical criteria

The ethics committee of University of Applied Health Sciences approved the implementation of this research. Examinees received a verbal explanation of the purpose of the research. They also received a written notice outlining the purpose of the research and were given notice that returning the completed questionnaire meant consent to participate in the research. The students participated in the research voluntarily and anonymously.

Results

Data were entered into an Excel spreadsheet and analysed in SPSS 17.0 software for statistical analysis.

Descriptive statistics of the results on the questions about the necessity of knowledge specified in the directive for performing nursing practice are shown in Table 1. The range of arithmetic mean was from 3.16 to 4.74. The highest value of the arithmetic mean of the respondent's response was recorded for the following item: nursing care (M=4.74); the next highest value was for communication skills (M=4.49).

The lowest value of the arithmetic mean of respondent responses was observed for the following item: research in nursing (M= 3.16); the next highest value was for legal aspects of nursing and health (M=3.67).

When analysing responses regarding self-assessment of the adoption of competencies (Table 2), the highest value of the arithmetic mean of the respondent's response was observed for the following competency: the ability to empower individuals, families and groups towards healthy lifestyles and self-care (M=3.85); the next highest value was for the ability to independently give advice to, instruct and support persons needing care and their attachment figures (M=3.43).

The lowest value of the arithmetic mean of respondents' responses is recorded for the following competency: the ability to independently initiate life-preserving immediate measures and to carry out measures in crises and disaster situations (M=3.07) the next lowest value was for the ability to independently assure the quality of and to evaluate nursing care (M=3.23); followed by the ability to comprehensively communicate professionally and to cooperate with members of other professions in the health sector (M=3.23).

Most of the respondents (74.6%) indicated that an internship was required after graduation, while 25.4% claimed that it was not a requirement. A total of 19.1% of respondents indicated that such an internship should last 3 months, 53.2% said 6 months, while 27.7% said that the internship should last 12 months (one year) (Table 3).

For the statistical analysis of the data, the Kruskal Wallis test and Mann-Whitney U-test were applied with significance determined as p <0.05. Non-parametric tests have been selected because of the relatively small number of subjects present in certain groups, i.e., the number of subjects is less than twenty, and some of the observed groups of different sizes are present.

When analysing the results of the necessary knowledge for performing nursing practice and the selfassessment of the adoption of competencies with the Mann-Whitney U-test, no statistically significant difference was observed with respect to the gender of the respondent (self-assessment of competency p=0.175; required knowledge p=0.874).

The Mann-Whitney U-test results of the necessary knowledge and self-assessment of competencies with regard to the completed secondary school (nursing secondary school related to other secondary school) indicate that there is a statistically significant difference in the answers related to the necessary knowledge for performing nursing practice p=0.035. Higher results are reported by students who have not completed nursing secondary school. Analysis of the results of self-assessment of the adoption of competencies did not show statistically significant differences between the two groups of respondents (p=0.844).

By analysing the results of the necessary knowledge, self-evaluated competencies and the opinion of the respondents on the need for internships using the Mann-Whitney U-test, a statistically significant difference was noted for the necessary knowledge for performing nursing practice in view of whether internships are required after completion of study p=0.033, i.e., students who indicated that internships are required provided higher responses related

| Table 1. Student opinions on the knowledge needed for nursing practice | | | | | |
|--|----------------------------|----------|--------------|------|------|
| | | N | % | М | SD |
| | Strongly disagree | 0 | 0 | | |
| | Disagree | 4 | 6.6 | | |
| Basic sciences – anatomy and physiology, pathology, | Neither agree nor disagree | 5 | 8.2 | | |
| biochemistry and radiology | Agree | 30 | 49.2 | | |
| biocritering dy drie rediology | Fully agree | 22 | 36.1 | | |
| | Total | 61 | 100.0 | 4.15 | 0.83 |
| | Strongly disagree | 0 | 0.0 | | |
| Social sciences - socialegy psychology principles of | Disagree | 5 | 8.2 | | |
| administration principles of teaching | Neither agree nor disagree | 12 | 19.7 | | |
| | Agree | 30 | 49.2 | | |
| | Fully agree | 14 | 23.0 | | |
| | Total | 61 | 100.0 | 3.87 | 0.87 |
| | Strongly disagree | 0 | 0.0 | | |
| | Disagree | 1 | 1.6 | | |
| Clinical medical sciences (surgery, internal medicine, | Neither agree nor disagree | 4 | 6.6 | | |
| neurology) | Agree | 28 | 45.9 | | |
| | Fully agree | 28 | 45.9 | | |
| | Total | 61 | 100.0 | 4.36 | 0.68 |
| | Strongly disagree | 1 | 1.6 | | |
| | Disagree | 1 | 1.6 | | |
| Nursing care | Neither agree nor disagree | 1 | 1.6 | | |
| | Agree | 7 | 11.5 | | |
| | Fully agree | 51 | 83.6 | | |
| | Total | 61 | 100.0 | 4.74 | 0.73 |
| | Strongly disagree | 0 | 0.0 | | |
| | Disagree | 3 | 4.9 | | |
| Communication skills | Neither agree nor disagree | 3 1.C | 4.9 | | |
| | Agree | 10 | 26.2 | | |
| | Fully agree | 39 | 100.0 | 4.40 | 0.01 |
| | IULdi Strongly disagree | 61 E | 100.0 | 4.49 | 0.81 |
| | |) 11 | 0.2 | | |
| | Disaglee | 72 | 10.U 26.1 | | |
| Research in nursing | | 15 | 24.6 | | |
| | Fully agree | 8 | 1 2 1 | | |
| | Total | 61 | 100.0 | 3 16 | 113 |
| | Strongly disagree | 0 | 0.0 | 3.10 | 1.10 |
| | Disagree | 8 | 131 | | |
| | Neither agree nor disagree | 14 | 23.0 | | |
| Legal aspects of nursing and health | Agree | 29 | 47.5 | | |
| | Fully agree | 10 | 16.4 | | |
| | Total | 61 | 100.0 | 3.67 | 0,91 |
| | Strongly disagree | 1 | 1.6 | | |
| | Disagree | З | 4.9 | | |
| | Neither agree nor disagree | 16 | 26.2 | | |
| Urganization and management in nursing care | Agree | 24 | 39.3 | | |
| | Fully agree | 17 | 27.9 | | |
| | Total | 61 | 100.0 | 3.87 | 094 |

| Table 2. Self-assessment of the adoption of competencies | | | | | |
|--|----------------------------|----|--------------|-------|------|
| | | N | % | М | SD |
| | Not capable | 0 | 0.0 | | |
| Competence to independently diagnose the nursing | Capable to a lesser extent | 8 | 13.3 | | |
| care required using current theoretical and clinical | Partially capable | 24 | 40.0 | | |
| knowledge and to plan, organize and implement | Capable | 27 | 45.0 | | |
| the acquired knowledge and skills | Fully capable | 1 | 1.7 | | |
| | Total | 60 | 100.0 | 3.35 | 0.73 |
| | Not capable | З | 5.0 | | |
| Competence to work together effectively with other | Capable to a lesser extent | 11 | 18.3 | | |
| actors in the health sector, including participation | Partially capable | 11 | 18.3 | | |
| in the practical training of health personnel on the | Capable | 28 | 46.7 | | |
| basis of the acquired knowledge and skills | Fully capable | 7 | 11.7 | | |
| | Total | 60 | 100.0 | 3.42 | 1.08 |
| | Not capable | 0 | 0.0 | | |
| | Capable to a lesser extent | 2 | 3.3 | | |
| Competence to empower individuals, families and | Partially capable | 15 | 25.0 | | |
| groups towards healthy lifestyles and self-care | Capable | 33 | 55.0 | | |
| | Fully capable | 10 | 16.7 | | |
| | Total | 60 | 100.0 | 3.85 | 0.73 |
| | Not capable | 4 | 6.6 | | |
| Competence to independently initiate life-preserving | Capable to a lesser extent | 10 | 16.7 | | |
| immediate measures and to carry out measures in | Partially capable | 27 | 45.0 | | |
| crises and disaster situations | Capable | 16 | 26.7 | | |
| | Fully capable | 3 | 5.0 | | 0.05 |
| | lotal | 60 | 100.0 | 3.07 | 0.95 |
| | Not capable | 1 | 117 | | |
| Competence to independently give advice to, | | / | 11./ | | |
| instruct and support persons needing care and their | | 24 | 40.0 25.0 | | |
| attachment figures | Capable Fully capable | 21 | 55.0 11 G | | |
| | Total | 60 | 100.0 | 3 4 3 | 0.91 |
| | Not canable | 1 | 1 7 | 5.45 | 0.51 |
| | Canable to a lesser extent | 8 | 13.3 | | |
| Competence to independently assure the quality of | Partially canable | 29 | 48.4 | | |
| and to evaluate, nursing care | Canable | 20 | 33.3 | | |
| | Fully capable | 2 | 3.3 | | |
| | Total | 60 | 100.0 | 3.23 | 0.79 |
| | Not capable | 4 | 6.7 | | |
| | Capable to a lesser extent | 10 | 16.7 | | |
| Competence to comprehensively communicate | Partially capable | 20 | 33.3 | | |
| protessionally and to cooperate with members of | Capable | 20 | 33.3 | | |
| סנוופן פוסופגאוטוג ווו נוופ וופמונוו גפרנטו | Fully capable | 6 | 10.0 | | |
| | Total | 60 | 100.0 | 3.23 | 1.06 |
| | Not capable | 2 | 3.3 | | |
| Competence to apply the same set its and its | Capable to a lesser extent | 6 | 10.0 | | |
| bis own professional practice as a purse responsible | Partially capable | 28 | 46.7 | | |
| for general care | Capable | 21 | 35.0 | | |
| | Fully capable | З | 5.0 | | |
| | Total | 60 | 1000 | 3 2 8 | 0.85 |

| Table 3. Answers of nursing students to questions about the need and duration of internship | | | | | | |
|---|--------------------|----|-------|--|--|--|
| | | Ν | % | | | |
| | Yes | 44 | 74.6 | | | |
| Do you think that internship is required after graduation? | No | 15 | 25.4 | | | |
| | Total | 59 | 100.0 | | | |
| | 3 months | 9 | 19.1 | | | |
| If needed, how much time should it take? | 6 months | 25 | 53.2 | | | |
| | 12 months (a year) | 13 | 27.7 | | | |
| | Total | 47 | 100.0 | | | |

to the necessary knowledge for performing a nursing profession. There was no statistically significant difference in the responses related to self-assessment of the adoption of competencies and the need for internships (p=0.138).

There were no statistically significant differences in respondents' responses regarding the length of internships p=0.547 (Kruskall Wallis test).

Discussion

One of the aims of the research was to identify students' opinions on the knowledge necessary for nursing practice consistent with the EU directives. The highest arithmetic mean was observed for the knowledge directly related to the nursing practice knowledge of nursing care (M=4.74), clinical medical science (M=4.36) and basic sciences (M=4.15). The second highest means were for communication skills (M=4.49), where 90.1% of the respondent's stated that they agreed and fully agreed that knowledge of communication skills is necessary for performing nursing practice. Calman states that patients consider interpersonal skills of nurses extremely important (32).

Although students consider research important for nursing practice (33), research knowledge is estimated to be the least necessary (M=3.16). The reasons for this may be that at this level of education (bachelor's degree), students prioritize knowledge of nursing care, and research is considered as to knowledge to be acquired and applied after graduate studies. At the same time, the number of research papers in nursing in day-to-day clinical practice is still small, and the students did not have much opportunity to see research conducted in a clinical setting; therefore, research is not perceived as a significant role for nurses.

Students coming from a gymnasium or other secondary schools gave significantly higher estimates of the necessary knowledge compared to students who had previously completed secondary nursing school.

Students in our research were cautious about selfassessment of the adoption of the competencies mentioned in the directive. In most situations, students stated that they are partially capable or capable, while very few respondents stated that they were fully capable (up to 11.7% of respondents on specific issues).

Similar results were obtained by Feng and Tsai (34) and Clark and Holmes (35), in which studies at the time of graduation and first employment of newly graduated nurses indicated that the new nurses did not feel ready for independent work. The students indicated that they had more specific knowledge from areas that they had studied more during the programme and thus possessed knowledge of certain areas in so-called "islands of knowledge," but that this knowledge is often difficult to integrate into nursing care (35). Students possess knowledge about technical skills, such as maintaining hygiene or drug administration, but they are scared of the scope of practice that is expected of them.

In our research, the highest assessment of the adoption of competencies was the ability to empower individuals, families and groups towards healthy lifestyle and self-care (M=3.85), which can be related to the educational content that is being studied during the third year of study and is related to health promotion. Further, it can be assumed that, along with the aforementioned competency, the theoretical knowledge required for this competency is related to the practical knowledge required for care, and therefore, studies give higher estimates. The ability to independently diagnose the nursing care required using current theoretical and clinical knowledge and to plan, organize and implement nursing care when treating patients on the basis of the acquired knowledge and skills (M=3.35) is ranked fourth, which can be related to the complexity of competence involved in setting up a nursing diagnosis, as well as planning, organizing and conducting nursing care. The lowest estimates were the competency to independently initiate life-preserving immediate measures and to carry out measures in crises and disaster situations (M=3.07), which shows that students are cautious and have serious doubts in evaluating competencies that emphasize self-reliance (without supervision of mentors or teachers) and the expected outcome (life-saving).

Meretoja and associates conducted research using the Nurse Competence Scale - self-assessment scale for competency on nurses employed in the hospital setting in Finland. The average result of nurses on a scale of 1-100 is 63.7, with the highest score being related to managing situations and activities, such as recognizing situations where patients are endangered, and responding appropriately to these situations, while lower estimates were given for competencies associated with quality assurance (36).

These results differ from ours, not significantly in average grades, but in areas where nurses feel more comfortable with competencies related to work experience and dealing with similar situations.

At the beginning of their work experience, there is a strong influence of self-esteem, but students often express doubt in their ability to adopt new knowledge and skills (37) and fear negative evaluation (38). As newly graduated nurses gain new knowledge and skills, their professional identities begin to develop, which contributes to an increase in self-esteem (38).

Most respondents in our research (74.6%) believed that an internship is required and should last up to 6 months. Students who give higher estimates of the necessary knowledge for performing nursing practice were significantly more likely to indicate that an internship was needed. At the end of their programme, students have anxiety related to the role they need to take, and the expectations of employers about the knowledge and skills they should have, so there are strong opinions on the need for knowledge and internship. The students are familiar with the organization of the internship since it was compulsory until recently. Formal support systems for newly graduated nurses and mentoring systems are just starting to develop. From the last clinical practice to the beginning of work as a nurse, sometimes several months and even more than a year have passed, especially in situations where graduate study is undertaken.

Research suggests that when beginning work as a newly graduated nurse, the guidance and acceptance of experienced nurses in workplaces is an extremely important support. Qualities significant for the newly graduated nurse are preparation, responsibility, knowledge and self-confidence (39). In the research by Kovner and her associates, 87% of the respondents indicated that they worked with an assigned preceptor or mentor, 80% of respondents had education about organizational policies and procedures, and 68% of respondents went through additional theoretical and practical training (40).

Knowledge on the progress and professional development of newly graduated nurses is important for nurse managers. Health institutions should consider providing mentors for new graduated nurses. Mentoring is beneficial for work organization and for the newly graduated nurse, because mentoring contributes to the development of their self-confidence, communication skills, socialization in the work environment, and increased opportunities for progress and reduces stress (41). Newly graduated nurses look for jobs in work environments that focus on quality in nursing care and provide support at the beginning of work and allow them to adapt to the scope and complexity of practice (37). A systematic and organized workplace support programme for newly graduated nurses supports the development of the new nurse as a professional, accelerates the development of the new nurse's competence and self-confidence and increases retention in the institution (42). During employment, nurses want to continue to acquire knowledge and work under the supervision of a mentor to adopt as many specific interventions as possible on a particular site (37).

Limitations of research

The main limitation of this research is related to the fact that the research was conducted using nursing students from only one higher education institution

and that in this generation of students, a greater number of respondents had previously completed gymnasium or some other secondary school, which was not a secondary school for nurses. Traditionally, most of the students enrolling in nursing studies have a pre-finished secondary school for nurses. Additionally, in the self-assessment of the adoption of competencies, the list of competencies was taken from the EU Directive, and several competencies were grouped into one competency, which could have impacted the outcome of the self-assessment. The study was conducted in one measurement at the end of the nursing programme, and it was not possible to determine the changes during the education and the impact of anxiety related to the completion of studies and expected employment to self-assessment. Future studies should be carried out using several nursing institutions, in two or three measurement points, and the obtained results should be compared.

Conclusions

At the end of the studies, students considered knowledge in the field of nursing care, communication skills, clinical and basic medical sciences are the most important. They are cautious about the self-assessment and the adoption of competencies of nursing practice, and most respondents believe that internships are required and should last up to six months.

Employment in the health care system is a stressful and challenging change for a newly graduated nurse. Graduates have different expectations when they face the reality of the workplace. The employer wants to employ a competent employee capable of providing holistic and safe care to patients, and the inclusion of a newly qualified nurse in the work system is a challenge for the employer.

To facilitate the transition from the role of a student to the role of a nurse, the cooperation of the education system and the health care system is necessary. The goal should be to reduce the gap between current health care practices and education systems. The educational system should strive to ensure the adoption of prescribed nursing competencies, and the health care system should ensure the introduction and support of newly graduated nurses when recruiting.

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MIŠLJENJA STUDENATA O POTREBNIM ZNANJIMA ZA OBAVLJANJE SESTRINSKE PRAKSE I SAMOPROCJENA USVOJENOSTI KOMPETENCIJA NA KRAJU STUDIJA SESTRINSTVA

Sažetak

Ciljevi istraživanja bili su utvrditi mišljenja studenata o potrebnim znanjima za obavljanje sestrinske prakse navedenima u direktivama EU-a, samoprocjenu studenata o usvojenim kompetencijama te mišljenja o pripravničkom stažu. Cilj istraživanja bio je i utvrditi postoje li razlike u odgovorima studenata ovisno o prethodno završenom obrazovanju.

Metode: U istraživanju je sudjelovao 61 student treće godine redovnog studija sestrinstva. Student ti su dobrovoljno i anonimno ispunili upitnik koji je konstruiran za potrebe istraživanja, a obuhvaćao je demografske podatke, područja učenja prema Direktivi 2005/36/EC i kompetencije prema Direktivi 2013/55/EU te pitanja povezana s potrebom i trajanjem pripravničkog staža po završetku studija.

Rezultati: Pri završetku studija studenti smatraju najvažnijima znanja iz područja zdravstvene njege (M=4,74), komunikacijskih vještina (M=4,49) te kliničkih i temeljnih medicinskih znanosti. Najnižom procjenjuju potrebu za znanjima iz osnova istraživačkog rada. Više rezultate povezane s važnošću potrebnih znanja navode studenti koji nisu završili srednju medicinsku školu (p=0,035). Studenti su oprezni prilikom samoprocjene usvojenosti kompetencija sestrinske prakse. Najvišom procjenjuju sposobnost usmjeravanja pojedinaca, obitelji i skupina prema zdravom načinu života i skrbi o sebi, a najnižom sposobnost samostalnog pokretanja trenutačnih mjera za spašavanje života te provođenja mjera u kriznim i opasnim

situacijama. Većina ispitanika (74,6 %) navodi da je pripravnički staž potreban nakon završetka studija te da bi trebao trajati do šest mjeseci. Studenti koji smatraju da je pripravnički staž potreban navode više vrijednosti u odgovorima povezanima s potrebnim znanjima za obavljanje sestrinske profesije (p=0,033).

Zaključak: Zapošljavanje novodiplomiranih medicinskih sestara u sustavu zdravstva i početak rada predstavlja stres i izazov za novodiplomiranu sestru. Kako bi se olakšala tranzicija iz uloge studenta u ulogu medicinske sestre nužna je suradnja obrazovnog i zdravstvenog sustava.

Ključne riječi: studij sestrinstva, medicinske sestre, kompetencije, znanja

The Harmonization of Braden Scale Assessments with Planned Interventions in Pressure Ulcer Prevention

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Abstract

Introduction: The Braden scale is a tried and tested pressure ulcer risk assessment scale. It is part of nursing documentation in the Republic of Croatia and is used in all hospitals as a tool for pressure ulcer risk assessment. By using the Braden scale, nurses can determine which interventions should be performed to prevent pressure ulcers.

Aim: A prospective study was conducted in the Respiratory Intensive Care Unit during one month, with the goal of determining the harmonization level between the Braden scale assessment and the planned interventions for the nursing diagnosis of "high risk of pressure ulcers". The aim was also to determine if the Braden scale assessment is used for all admitted patients, if the Braden scale assessment is used daily for all patients and if nursing care plans are made for patients who have a risk of pressure ulcer development.

Methods: A form was created for the purpose of conducting this study. The form contains patient data on sex, admission and discharge dates, as well as data regarding the Braden scale assessment at the moment of admission, during the stay in the ICU and at discharge.

Results: The study included 23 patients. 20 patients had pressure ulcer risk as assessed by the Braden scale. For 8 patients, a nursing care plan for "high risk of pressure ulcers" was written and interventions were conducted that showed very good harmonization with the parameters of the Braden scale.

Conclusion: Although the Braden scale is a pressure ulcer risk assessment tool, the study shows broader application possibilities. This refers to the possibility of using the parameters of the Braden scale as guidance for choosing interventions.

Introduction

The Braden scale is a tried and tested pressure ulcer risk assessment tool (1). It is an integral part of the nursing documentation in the Republic of Croatia and is used in all hospitals as a tool for the assessment of pressure ulcer risk. It consists of 6 parameters: sensory perception, moisture, activity, mobility, nutrition, friction and shear. The scores range from 6 to 23, the lower scores showing a higher risk of pressure ulcers (1). By using the Braden scale, nurses can determine which interventions should be performed to prevent pressure ulcers. It is of special importance to pay attention to the Braden scale parameters because they enable us to determine specific interventions for a specific patient (2).

Available algorithms show that interventions for pressure ulcer prevention can be divided according to the cumulative point score and according to the subscale scores of the parameters that make up the Braden scale (3). The use of such algorithms is not common in Croatia, although it would, in our opinion, enable nurses to define interventions for patients with a high risk of pressure ulcers more easily.

Gadd and Morris feel that the use of the Braden scale in such a way that interventions are planned according to the score from the Braden scale parameters can be an effective way of preventing pressure ulcers in hospitals (4,5).

Methods

The prospective study included patients from the Respiratory Intensive Care Unit during the period between February 27th and March 27th 2017. The study was conducted at the Clinic for Pulmonary Diseases Jordanovac, Zagreb. During this month-long study, there were 23 patients in the Respiratory Intensive Care Unit - 15 were male and 8 female. The average age of the patients was 54.8 (36-84 years of age). The average bed days amounted to 9.86 days (ranging from 1 to 21 days). For every patient, a Braden scale assessment was made at admission as well as daily during their stay on the ward as part of the nursing documentation. The Braden scale assessment was done by nurses in charge of the patient, whereas the nursing care plan was done by the shift manager or the ward's head nurse. For this purpose, a form was created which contained the admission and discharge dates, as well as data regarding the Braden scale assessment at the moment of admission, during the stay in the Respiratory Intensive Care Unit (RICU) and at discharge. Using the form, the point score was monitored for every patient according to every parameter of the Braden scale in order to determine the margin point score and the need for interventions that would arise from that.

Results

Of the 23 patients hospitalized in the RICU during the month-long study, 20 had a risk of sustaining pressure ulcers at admission and during their stay in the RICU. None of the patients admitted in the RICU during the study have previously had pressure ulcers. Table 1 shows the point score for the 23 patients hospitalized in the RICU. The table shows the number of patients admitted during that time, distributed according to the parameters of the Braden scale, with the assessment done at patient admission. It also shows the average number of bed days for the aforementioned number of patients, as well as any changes in the point score of the Braden scale during their stay on the ward. The table also shows for which patient group the nursing care plan was made. 8 patients had a written plan for "high risk of pressure ulcers". For those patients, interventions aimed at preventing pressure ulcers were performed during the whole time of their hospitalization in the RICU. This amounts to 117 days of interventions in pressure ulcer prevention. It was noted that these patients had a score of 12 points or less, i.e. these patients were assessed as having "high risk" or "very high risk" on the Braden scale. For patients with an

| | Table 1 | . Braden scale point | t score | |
|---|---|----------------------------|--|---|
| Braden scale Parameters/points Assessment at admission | Number of patients in relation to the point score at admission | Average number of bed days | Score changes in relation to the score at admission | Nursing plan made during the patient's stay on the ward |
| Very high risk/ 6-9 points | 2 | 9.5 days | Yes (1 high risk patient) | Yes |
| High risk/ 10-12 points | 6 | 12 days | Yes (2 moderate risk patients; 1 very high risk patient) | Yes |
| Moderate risk/ 13-14 points | 5 | 8 days | Yes (3 very high risk patients; 1 mild risk patient) | No |
| Mild risk/ 15-18 points | 7 | 4 days | Yes (1 high risk patient; 1 moderate risk patient) | No |
| No risk/ 19-23 points | З | 6 days | No | No plan necessary |

assessment of "moderate risk" or "mild risk" on the Braden scale at admission, no nursing care plan for "high risk of pressure ulcers" was written.

All patients with a written nursing care plan for "high risk of pressure ulcers" were put on a high protein diet regardless of the way they were fed (orally or through a feeding tube). Patients with no written nursing care plan were not put on a high protein diet. The nursing care plan for "high risk of pressure ulcers" was written according to the recommendations for standardized plans made by the Croatian Nursing Council.

Table 2 shows the interventions cited in the nursing care plan for the 8 patients that had a written nursing care plan as well as the number of days during which interventions were conducted.

| | Table 2. Nursing plan interventions | | | |
|----|--|---|--|--|
| | Interventions | Total number of days during which interventions were performed | | |
| 1 | Change of the patient's position every 2 hours | 117 days | | |
| 2 | Assess the risk factors for the development of pressure ulcers | 117 days | | |
| З | Maintain the hygiene of skin and bed linen | 117 days | | |
| 4 | Ensure optimal hydration of the patient | 117 days | | |
| 5 | Put pillows under the knees | 117 days | | |
| 6 | Use Fowler's low position | 64 days | | |
| 7 | Change the position by raising, not dragging | 117 days | | |
| 8 | Perform passive extremities exercises | 56 days | | |
| 9 | Increase the intake of proteins and carbohydrates | 30 days | | |
| 10 | Use pain medication | 10 days | | |
| 11 | Control the development of edema | 30 days | | |
| 12 | Record the current state | 117 days | | |
| 13 | Educate families about measures to prevent pressure ulcers | 2 days | | |

Table 3 shows the average point score for every parameter of the Braden scale. Along with the average point scores for every parameter of the Braden scale, the possible point range as well as the margin point score were shown (3). Consequently, we can note that interventions for patients should be planned in accordance with parameters of sensory perception, activity and mobility as well as friction and shear. The Activity parameter has the lowest point score, while the Moisture parameter has the highest point score. All patients whose Braden scale assessment at admission resulted in very high to high risk were immediately put on a high protein diet, so the Nutrition parameter cannot be correctly assessed. Since interventions were aimed at the Activity, Friction and Shear, Mobility and Sensory Perception parameters, we believe that the harmonization levels between the parameters of the Braden scale are good.

Interventions do not include the usage of pressure ulcer prevention products (mattresses, pillows, etc.), consultation with the physiotherapist (who is involved in patient care in most RICUs), nor do they include the adaptation of interventions to the needs of the individual patient. Planned interventions were carried out during the whole time of the patients' hospitalization. None of the nursing care plans had a written evaluation. For transferred patients, no endevaluations were written and none of the clinical handovers stated whether it was necessary to continue to carry out the nursing care plan.

Two patients developed 1st degree pressure ulcers, which was entered in the pressure ulcer form. At that moment, these patients had an assessment of high risk of pressure ulcer development. No change of plan and interventions was done for those patients.

Discussion

The month-long study in the RICU showed that the Braden scale was used daily as a pressure ulcer evaluation tool. Based on the Braden scale assessment, interventions are planned and nursing care plans are written. It has been noticed that plans are written only if the assessment on the Braden scale shows a high or very high risk, whereas for Braden scale values that point to a moderate or mild risk no nursing care plans are written. It is difficult to determine why this is so. As part of undergraduate nursing study final papers on the topic of pressure ulcers, the importance of prevention is noted, especially the risk assessment for the development of pressure ulcers, but prevention interventions are usually not linked to the parameters of the Braden or any other scale (6, 7). A special emphasis on the nutritional status was noticed, but it was neither linked to the data that existed in the nursing documentation nor with the parameters of the Braden scale that assessed diet (6). Režić and Pauker note their observations where of the 71 patients with pressure ulcers, the Braden scale assessment showed that in 64 cases the Braden scale score was 12 or less, while in 7 cases the score was 14, showing moderate risk (8).

Since no intervention algorithms for the Braden scale exist, it is possible that nurses lack guidelines on how and when to plan and coordinate pressure ulcer prevention interventions.

All nursing care plans lack evaluation, as well as records about the existing risk of pressure ulcer development in the patient handover.

| | Table 3. Braden sca | ale - point score | |
|--------------------------------|----------------------------|-----------------------|----------------------|
| B | raden scale -average p | oints for 20 patients | |
| Parameters of the Braden scale | Average points | Possible point range | Margin point score * |
| Sensory perception | 2.6 | 1-4 | 3 |
| Moisture | 3.1 | 1-4 | 3 |
| Activity | 1.1 | 1-4 | 3 |
| Mobility | 1.9 | 1-4 | 3 |
| Nutrition | 3.0 | 1-4 | 2 |
| Friction and shear | 1.4 | 1-3 | 2 |

*Margin point scores taken from: Braden Scale Interventions Algorithm (https://www.clwk.ca/buddydrive/file/braden-scale-interventions-algorithm/)

Other countries have specially educated wound treatment teams. These teams come to the ward when requested and carry out an assessment of the patients' condition, give recommendations for treatment, continue to follow patients' condition and decide on further measures in case of change in condition. Such teams are needed in our country, too. At the moment, wound treatment teams rarely exist on the institutional level in Croatia. The Commission for Wounds, an example of good practice, shows how it significantly improved the work on the prevention and treatment of pressure ulcers (9).

Conclusion

The study shows that nurses assess the risk of the development of pressure ulcers daily using the Braden scale for all patients on the ward, but the nursing care plan "High Risk of Pressure Ulcer Development" is written only when the Braden scale assessment shows high/very high risk, whereas no plan is written when the risk is moderate or mild. No evaluations were written for patients who had written plans. The harmonization of the Braden scale assessment with planned interventions showed good harmonization.

The authors feel that it is necessary to develop algorithms for pressure ulcer prevention interventions linked to the parameters of the Braden scale, following the example of other countries. Algorithms give a clear, concise review of interventions that are necessary for pressure ulcer prevention.

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USKLAĐENOST PROCJENE NA BRADEN LJESTVICI S PLANIRANIM INTERVENCIJAMA VEZANIM UZ PREVENCIJU NASTANKA DEKUBITUSA

Sažetak

Uvod. Bradenova ljestvica dokazano je pouzdana ljestvica za procjenu rizika za nastanak dekubitusa. Sastavni je dio sestrinske dokumentacije u Republici Hrvatskoj i upotrebljava se u svim bolničkim zdravstvenim ustanovama kao alat kojim procjenjujemo rizik za nastanak dekubitusa. Medicinske sestre koristeći se Bradenovom ljestvicom mogu utvrditi koje intervencije moraju provoditi u svrhu prevencije dekubitusa.

Cilj. Prospektivno praćenje provedeno je na odjelu pulmološke intenzivne skrbi Klinike za plućne bolesti Jordanovac, Zagreb tijekom mjesec dana. Ciljevi su bili: utvrditi usklađenost procjene na Bradenovoj ljestvici s planiranim intervencijama sestrinske dijagnoze visokog rizika za nastanak dekubitusa, utvrditi procjenjuje li se kod svih primljenih pacijenata Bradenova ljestvica, utvrditi procjenjuje li se Bradenova ljestvica svakodnevno za sve pacijente te izrađuju li se planovi zdravstvene njege za pacijente koji imaju rizik za nastanak dekubitusa.

Metode. Izrađen je obrazac u svrhu ovog praćenja u koji su upisivani podaci o spolu, datumu prijema i datumu otpusta te podaci povezani s procjenom po Bradenovoj ljestvici prilikom prijema, tijekom boravka na odjelu te prilikom otpusta.

Rezultati. U praćenom periodu ležalo je 23 pacijenta. Njih 20 imalo je rizik za nastanak dekubitusa, procijenjen po Bradenovoj ljestvici. Za osam pacijenata napisan je plan zdravstvene njege "Visok rizik za nastanak dekubitusa" te su provođene intervencije koje pokazuju dobru usklađenost s parametrima Bradenove ljestvice.

Zaključak. Iako je Bradenova ljestvica alat za procjenu rizika za nastanak dekubitusa, praćenje pokazuje mogućnosti veće primjene. To se odnosi na mogućnosti primjene parametara Bradenove ljestvice kao vodiča za odabir intervencija.

Ključne riječi: Bradenova ljestvica, prevencija dekubitusa, plan zdravstvene njege, algoritam intervencija za dekubitus

Incidence of Complications in Patients Treated with Plaster Splints in Emergency Departments in Four Hospitals

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Keywords: emergency departments, plaster splint, education, complications

Abstract

Aim: 1. To determine the frequency of complications in patients treated with plaster splint at emergency departments. 2. To determine the existence of correlation of complications in patients treated with a plaster splint at emergency departments with prior work experience in surgical plaster rooms.

Hypothesis: Frequency of complications in patients treated with plaster splints at emergency departments whose immobilization is performed by nurses with prior work experience in surgical plaster rooms is lower than in patients whose immobilization is performed by nurses educated for the needs of plastering at emergency departments.

Materials and methods: Research - April and May 2015, at Našice General Hospital, University Hospital Centre Osijek, Čakovec County Hospital and Dr. Tomislav Bardek Koprivnica General Hospital. Sample - 153 patients and 34 nurses. Research instruments - two anonymous questionnaires created for the purposes of research. Descriptive and nonparametric statistical data analysis has been applied with α = 0.05 level of significance.

Results: pressure sores of different intensity are present in 8.9% of the second group respondents. This complication is not present in the first group. Plaster splints in the first group are adequate in 86.7% of cases, while they are not adequate in 59% of the cases in the second group.

Conclusion: The hypothesis has been confirmed.

Introduction

Dorsal forearm and shin plaster splints are most commonly used immobilization devices in everyday work (1). Fractures, sprains and contusions of wrist and ankle are the most common injuries that are an indication for treatment using those types of immobilization (2, 3). In the Croatian health care system, fresh traumas are usually treated at Emergency Departments (ED) where immobilization is most commonly used. Nurses – plaster makers are an integral part of ED. Using our knowledge, we defined the origins of two groups currently working at EDs. One group had experience of working at outpatient clinics as plaster makers, while the others were educated at EDs to meet their needs. Thus, a question arose "Is there a difference between these two groups?"

Aim: 1. To determine the incidence of complications in patients treated with plaster splints at EDs. 2. To establish the existence of a connection between complications in patients treated with plaster splints at EDs and experience of nurses who perform immobilization. Hypothesis: The incidence of complications in patients treated with plaster splints at EDs where immobilization is administered by nurses with prior experience in surgical plaster rooms is lower than in patients whose immobilization is performed by nurses trained in immobilization at EDs. ly undergone repositioning of bone fragments. The sample comprised of 153 patients and 34 nurses. Respondents were divided into two groups. One group consisted of respondents treated at institutions in whose EDs immobilization is performed by nurses who have experience of working in surgical plaster rooms, while the second group included respondents treated at institutions in whose EDs immobilization is performed by nurses who were trained for working at EDs plaster rooms. Institutions were coded and the first group comprised of institutions 1 and 3, while the other group consisted of institutions 2 and 4. The research used stratified random sample. Both groups were uniform in their demographic properties. The research was carried out in April and May 2015. The study used two questionnaires structured to meet the needs of this research. The first questionnaire was used to assess the immobilization and consisted of two parts. The first part was filled out by a respondent-patient (age, sex, exclusion factor, evaluation of immobilization comfort, subjective difficulties, estimation of pain intensity, wearing time) and the second part was filled out by a research associate (questions: types of immobilization, complications during wearing the immobilization device, assessment of immobilization device's technical performance). The second questionnaire was intended for nurses who performed imobilization and it consisted of demographic questions (age and gender), questions about the level of education, experience of working in operating rooms or at EDs, satisfaction with education, whether the education was sufficient and whether they were willing to participate in further education. Questions in both questionnaires were both open-ended and closed-ended.

Methods

Respondents consisted of a sample of patients treated at hospital emergency departments at Našice General Hospital, University Hospital Centre Osijek, Čakovec County Hospital and Dr. Tomislav Bardek Koprivnica General Hospital. The study included patients who were primarily treated at EDs due to injuries of the musculoskeletal system which were treated with a dorsal forearm or shin plaster splint. The research also included nurses who performed immobilization on patients treated at EDs. The respondents were between 10 and 90 years old and have not been diagnosed with diabetes and had not previous-

Ethics

The approval of the ethics committees of Našice General Hospital, University Hospital Centre Osijek, Čakovec County Hospital and Dr. Tomislav Bardek Koprivnica General Hospital was required for the purpose of conducting the research as well as the approval of the Committee for Ethical and Status Issues of Nurses and Technicians in University Hospital Centre Osijek. Ethics committees from all these institutions gave their consent to conduct research. Before their inclusion in the study, all respondents were informed about the research purpose. They received a verbal notification and a written notice, as well as an informed consent for participating in the study. All respondents volunteered to participate in the study, which was confirmed by their signatures. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki.

Statistics

Statistical analysis was performed using the statistical program SPSS 22.0 (SPSS Inc., Chicago, IL, USA). We used the Kolmogorov-Smirnov test for testing normal distribution of numerical variables. The comparison of nominal variables in the case of a large number of samples (more than five in a cell) was performed using the Pearson's chi-squared (χ^2) test, while we used the Fisher's exact test in the case of a small number of samples. When comparing numerical nominal variables with a normal distribution of numerical variables, the Student's t-test and ANOVA parametric test were used, while in abnormal distribution we used the Mann-Whitney and the Kruskal-Wallis tests. The level of statistical significance for all comparative tests was p <0.05.

Results

In terms of gender, in the first group we had 38.7% (29) of women and 61.3% (46) of men, and in the second group 41% (32) of women and 59% (46) of men (Pearson's chi-squared, p = 0.766).

The difference in average age between the two groups was not statistically significant; the average age of the respondents from the first group was 30.80 years and the average age of the respondents from the second group was 35.86 years (Mann-Whitney test, p = 0.380).

Immobilization Assessment - respondents treated with immobilization

To the claim "Immobilization was comfortable" respondents in the first group expressed their agreement in 98.7% of cases. In the second group, the same statement was made by 38.5% respondents (Pearson's chi-squared, p = 0.000).

To the claim "While I was wearing the immobilization device, I felt..." respondents from the first group, 60% of them, did not list any difficulties, while in the second group the same was done by 34.6% of respondents (Pearson's chi-squared, p = 0.000).

Respondents from both groups assessed their pain intensity with an average score of 2 (Mann-Whitney test, p = 0.354).



Figure 1. Overview of responses to the claim "Immobilization was comfortable" between the two groups



Figure 2. Overview of responses to the claim "While I was wearing the immobilization device, I felt..." between the two groups

Respondents from the first group had on average spent 6.89 days wearing the immobilization device, while respondents from the other group had it for 7.4 days (Mann-Whitney test, p = 0.001).

Immobilization Assessment 2 - research associate

The first group consisted of a total of 75 respondents (28% forearm immobilization and 72% shin immobilization) who evaluated immobilization devices, while the other group consisted of 77 respondents (56.4% forearm immobilization and 43.6% shin immobilization) (Pearson's chi-squared, p = 0.000). No complications were experienced by 78.7% of respondents from the first group, while in the second group that score was 71.8%. In the second group, 8.9% of patients experienced pressure ulcers of varying degrees (Fisher's exact test, p = 0.121).

In the evaluation of technical features of immobilization devices, the first group had 86.7% of immobilization devices that were adequate, while in the second group only 41% of immobilization devices were considered adequate (Pearson's chi-squared, p = 0.000).

Questionnaire for nurses

The first group consisted only of male nurses who performed the immobilization (12 male nurses), while the second group consisted of nurses of both sexes;

male nurses 45.5% (10) and female nurses 54.5% (12) (Fisher's exact test, p = 0.002). Male nurses from the first group were younger – 31.5 +/- 9.276 years old on average, compared to the second group where nurses were 44 +/-10.508 years old (Mann-Whitney test, p = 0.626).

In the first group, 75% of male nurses had completed a secondary education, and 25% had a higher degree, while in the second group 59.1% respondents had completed a secondary education, and 36.4% had a higher degree and 4.5% of nurses had a university degree (Fisher's exact test, p = 0.808).

Male nurses from the first group all stated that their knowledge on plaster splints was a result of their work in surgical plaster rooms, while 81.8% nurses from the second group responded that their knowledge on plaster splints was a result of education required for working at EDs (Fisher's exact test, p = 0.000).

In the first group, 58.3% of male nurses rated their satisfaction with education as good, while 41.7% of them rated their satisfaction as very good. Respondents from the second group, 27.2% of them, rated their satisfaction with education as very bad and bad and 13.6% of them rated their satisfaction as neither good nor bad. Good grade was given by 59.1% of nurses in the second group (Fisher's exact test, p = 0.005).



Figure 3. Overview of incidence of complications linked to immobilization between the two groups

When asked "Do you think that education on administering plaster splints which you have received is sufficient?" 91.7% respondents from the first group said "yes", while only 36.4% of respondents from the second group answered in the same way (Pearson's chi-squared, p = 0.002).



Figure 4. Overview of responses between the two groups regarding technical characteristics of



Figure 5. Overview of responses with regard to previous experience

When asked "If you were offered additional training in administering plaster splints, would you participate in it?", 83.3% respondents from the first group responded positively, while 68.2% respondents from the second group answered in the same way. (Fisher's exact test, p = 0.439).

Discussion

Back in 1852, Matthysen, a Dutch military surgeon, discovered how to successfully maintain the retention of a bone fragment and protect relations between the bone fragments by dipping cloth strips into water to which he added plaster (1). Although it is hard to imagine that 1852 is connected with the



Figure 6. Overview of answers to the question "Satisfaction with education on administering plaster splints"



Figure 7. Overview of answers to the question "Do you think that education on administering plaster splints which you have received is sufficient?"

conservative treatment of fractures in the 21^{st} century, the link exists. Despite the growing selection of different immobilization materials, plaster was used at the beginning of this century in 98% of performed immobilization cases, which makes it the most common (1, 4).

The study included 153 patients, who were divided into two groups. Respondents were treated with dorsal forearm and shin plaster splints because these are the two most common immobilization types (1, 5). There is no statistically significant difference regarding the representation of gender and age within the two groups. Women were represented in the first group by 29 respondents, and by 32 respondents in the second group, while there were 46 men in each group. Respondents from both groups were of equal age, the first group was 30.80 years old, and the second group was 35.86 years old. When assessing immobilization based on respondents' responses to the claim "Immobilization was comfortable", there is a statistically significant difference in the responses between the two groups (p = 0.000). Respondents from the first group agreed with this claim, as much as 98.7% of them, while the same was done by only 38.5% of respondents from the second group. When citing difficulties, respondents from the first group demonstrated better results than those from the



"If you were offered additional training in administering plaster splints, would you participate in it?"

second groups and mentioned fewer subjective difficulties. In the second group, respondents have more often reported "two or more difficulties" compared to the first group.

Respondents from the first group wore the immobilization device for 6.89 days on average, while the second group's average was 7.74 days. Here we see a statistically significant difference (p = 0.001), but we believe that this difference does not significantly affect any aspect of this research. When expressing pain intensity on a visually analogue scale (VAS), respondents assessed their pain with grade 2 (6, 7) on a scale of 0 to 10, which constitutes light pain (6). Here no difference in expression of pain exists.

During the immobilization, 40% of respondents from the first group listed at least one subjective issue, while at the same time 65.4% of respondents from the second group did the same. Two or more subjective difficulties were reported more by respondents from the second group than from the first. That presents a statistically significant difference, amounting to p = 0.000. Although these are subjective difficulties that depend on the person and their perception, some of them (e.g. swelling) are normal after an injury (post-traumatic oedema) (1). However, here we see an obvious difference in expressing difficulties between the groups. According to Hančević, "… the risk of post-traumatic oedema and circulatory disturbances should be explained and patients should be warned ..." and "well immobilized limb does not hurt, thus each patient with such difficulties should be examined carefully"; thus we can say that, between the two groups, there is a difference in the correctly set immobilization (1). An immobilization device which is too tight due to tight bandages, an insufficiently padded immobilization device, an immobilization device of inadequate width-length and/or inadequate education of patients during immobilization treatment can cause such disturbances (1, 8, 9, 10), so that may be the cause of these differences between the groups.

Gender and age are demographic variables that affect the experience of pain. For the purposes of credibility of the data obtained from the questionnaire, it is important to have an equal number of women and men in both groups, which we have shown through results (11, 12). Age has no significant influence on the intensity of pain (13). In assessing the immobilization using the claim "Immobilization was comfortable" and the question where the respondents were asked to indicate the difficulties they had experienced, respondents from the first group showed positive results in relation to the second group and it can be said that the respondents were more satisfied, and immobilization was more comfortable and caused fewer subjective problems. These subjective difficulties are signs of skin integrity damage (14, 15). The creation of post-traumatic oedema begins immediately after the trauma and stops a few days later (1). Plaster immobilization devices are solid cylinders which do not spread, thus this new oedema cannot expand anywhere and may lead to limb strangulation (1).

In assessing the complications of immobilization by a professional associate, we made a remarkable, if somewhat disturbing discovery (if you take into account that the immobilization device was not worn for a long time - approximately 7 days) that 8.9% of respondents had damaged skin integrity - pressure ulcers of various stages up to the appearance of necrotic tissue. This is extremely alarming and worrying because the treatment time was short, and we can only imagine what would have happened if the period was longer. Since we have previously mentioned that post-traumatic oedema subsides after a few days, "an empty space" can be created between the immobilization device and limbs (1). Movement of the immobilization device after the formation of these empty spaces causes persistent irritation (1, 4) of already developed and possibly undetected decubitus and it only makes it worse.

In the evaluation of the technical characteristics of immobilization, there is a statistically significant difference (p = 0.000), and thus 86.7% of immobilization devices in the first group were adequate, while the result from the second group was only 41%, i.e. in the second group there were 59% of immobilization devices that were inadequate in one or more technical segments (inadequate length, volume, limb not placed in the correct position, etc.). Regarding individual inadequacies, most often mentioned inadequacy in the second group was "inadequate length of the immobilization device". What exactly that means for the respondents will be explained on the example of a forearm plaster splint. Forearm immobilization incudes the area of the dorsal side of the forearm from metacarpophalangeal joints to just below the elbow (1) so that, if it is too long, it automatically limits the movement of the metatarsophalangeal joint and / or elbow. This situation leads to a decrease in the finger activity, whose purpose is increasing the circulation (16), which reduces the circulation function, i.e. fulfilment of tissue needs (17). This consequently causes muscle atrophy of the immobilized limb (4, 17). Muscle inactivity leads to muscle atrophy.

The difference between the two groups in the number of individuals who administered immobilization is statistically significant (p = 0.002). Here the difference is also in the demographic characteristics of respondents: in the first group all respondents were male, while in the second group there was an equal number of both sexes. Respondents from the first group were younger on average, i.e. the average age of respondents in the first group was 31.5 +/- 9.276 years and in the second group 44 +/- 10.508 years. According to the level of education, the majority of respondents from the first group have completed a secondary education, while 25% of them have a higher level of education. The second group had a higher percentage of respondents with a higher education degree. According to the source of knowledge about the plaster splints between the two groups, there is a statistically significant difference (p = 0.000). Respondents from the first group state that their knowledge is the result "of working as a plaster maker at the surgical clinic". On the other hand, respondents from the second group claim, as

much as 81.8% of them, that their knowledge is the result of "education for working at EDs". The respondents from the first group, 58.3% of them, rated their satisfaction with education as good, while a very good grade was given by 41.7% of them. In the second group, 59.1% of respondents assessed their education as good or very good. Here we see a statistically significant (p = 0.005) difference between the two groups – respondents from the first group were satisfied with their training compared to those from the second group. Since we have previously shown that the training of the two groups differs, we can say that education on plaster immobilization which is the result of working at surgical clinics as a plaster maker gives greater satisfaction than in the second group that was trained only for purposes of working at EDs. When these results are linked with the previous result, it can be concluded that staff trained on immobilization at EDs is not sufficiently trained or is less trained compared to those who have worked in a surgical plaster room. The justification for this claim can be found in the Ordinance on EDs Performance, by which a space for the installation and necessary accessories was ensured, but not for training for the workplace, as opposed to the workplace of triage nurses (18).

When asked "Do you think that education on administering plaster splints was sufficient?", respondents from the first group answered mostly positive (91.7%), while the same answer was given by only 36.4% of respondents from the second group.

Respondents from the first group, as much as 83.3% of them, stated that they were willing to undergo further education on administering immobilization, whereas in the second group the same statement was made by 68.2% of respondents. Respondents from the first group still gave positive answers related to their education, so we have far more positive results in the first group compared to the second group regarding the belief that the education they had received was sufficient. However, a high percentage of them is ready to undergo additional education, if possible. We must admit that despite a lower level of education of the respondents in the first group, in each segment of the tests they showed better results compared to the second group. This is somewhat non-specific when looking at the general population characteristics. Respondents from the second group should have achieved better results because of their higher academic level. We believe this case is reversed because immobilization, i.e. knowledge on immobilization, is a highly specialized area that covers only a segment of trauma patients' health care and requires specific knowledge and skills. Even though respondents from the first group had better results and stated that they "have experience of working at a surgical clinic as plaster makers", we did not find any written record, or any professional literature in Croatian aimed at the development of immobilization which was written for nurses who administer immobilization. Standardized training in the Croatian health care system for making immobilization devices does not exist. According to our empirical experiences, there are only individual efforts; training that is passed on "from generation to generation" which we consider insufficient. According to the Nursing Act in force, Article 5: "Health/nursing care involves the application of specific knowledge and skills based on scientific knowledge from nursing, natural, medical and human sciences" and Article 10: "Further training of nurses is conducted when the scope and complexity of activities and expected results require additional training or specialization in a particular area of health care" (19), while the competence issued by the Croatian Chamber of Nurses reads: "immobilises damaged limb - using plaster bandage, a metal splint, vacuum splints" (20). We believe it is necessary (as stated in the above Articles), to provide additional training which would lead to reducing and equalizing the frequency of complications of immobilization treatments, improving the quality of life of patients treated with immobilization and technically correct immobilization that is made according to the rules of our profession. The British Orthopaedic Association standards on administering plasters state: "Standards need to be formulated to promote the likelihood of the service being delivered safely and effectively, to be clear about what has to be done to comply, to be informed by an evidence base and to be effectively measurable" (21). Among other things, we must strive for standardization and written instructions as is the case in other countries in Europe (21, 22). Sharma et.al. in their work claimed "Most complications can be avoided by using proper immobilization techniques" (10).

Conclusion

Based on this study, the following can be concluded: there is a statistically significant difference in responses between the two groups of respondents who participated in the study. The respondents from the second group who were treated with plaster immobilization, which was administered by nurses who were trained in administering immobilization for the purposes of working at EDs, more frequently listed subjective difficulties (pinching, itching, swelling) and were much more likely to give a negative grade for immobilization comfort than respondents from the first group. Respondents from the second group were more likely to suffer pressure ulcers during the immobilization than respondents from the first group. Immobilization devices in the first group were technically adequate in 86.7% of cases and in the second group the same can be said for 41% of respondents.

Male nurses in the first group were much more likely to express a positive result of training they received in administering immobilization and considered that it was sufficient compared to nurses in the second group. Between the two groups, there is a difference in every estimated segment. Respondents from the second group on average recorded more negative results compared to the first group, and based on these results, the importance of further education should be noted. Standardized training for nurses - plaster makers does not exist in the health system of the Republic of Croatia. This could be an area for greatest improvement. In the future, it will be necessary to determine the level and type of education at EDs and how to provide all health care system users with the same quality of services.

The hypothesis is confirmed.

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UČESTALOST KOMPLIKACIJA U BOLESNIKA LIJEČENIH SADRENOM UDLAGOM U OBJEDINJENIM HITNIM BOLNIČKIM PRIJEMIMA ČETIRIJU BOLNICA

Sažetak

Ciljevi. 1. Utvrditi učestalost komplikacija u bolesnika liječenih sadrenom udlagom u OHBP-ima.

2. Utvrditi postojanje povezanosti komplikacija u bolesnika liječenih sadrenom udlagom u OHBP-ima s iskustvom prijašnjeg rada u kirurškim gipsaonicama.

Hipoteza. Učestalost komplikacija kod bolesnika liječenih sadrenom udlagom u OHBP-ima kojima su imobilizaciju postavljali medicinske sestre ili medicinski tehničari s prijašnjim iskustvom rada u kirurškim gipsaonicama manja je nego u bolesnika kojima su imobilizacije postavljali medicinske sestre ili medicinski tehničari educirani za potrebe gipsanja u OHBP-ima.

Materijali i metode. Istraživanje: travanj i svibanj 2015. godine u OB-u Našice, KBC-u Osijek, ŽB-u Čakovec i OB-u Dr. Tomislav Bardek Koprivnica. Uzorak: 153 bolesnika i 34 medicinske sestre / medicinska tehničara. Instrumenti istraživanja: dva anonimna anketna upitnika kreirana za potrebe istraživanja. Primijenjena je deskriptivna i neparametrijska statistička obrada, razina značajnosti postavljena je na α = 0,05.

Rezultati. Dekubitus različitog stupnja javlja se kod 8,9 % ispitanika druge skupine, u prvoj skupini ta komplikacija nije zabilježena. Sadrene su udlage u prvoj skupini adekvatne u 86,7 % slučajeva, a u drugoj su skupini neadekvatne u 59 % slučajeva.

Zaključak. Hipoteza je potvrđena.

Ključne riječi: OHBP, sadrena udlaga, imobilizacija, edukacija, komplikacije

Use of the Objective Structured Clinical Examination in Undergraduate Nursing Education

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Keywords: OSCE (Objective Structured Clinical Examination), nursing education, clinical skills

Abstract

Introduction. The Objective Structured Clinical Examination (OSCE) is often used in undergraduate nursing education as a means to provide standardised and objective evaluation of clinical skills required for nurses' future professional activity. It aims to help students master different clinical skills and prepare them for an adequate response to specific problems through simulation of various practical scenarios. Students practice clinical skills in a safe and controlled environment under the supervision of a mentor. Since the mid-1970s, OSCE has been used to assess clinical skills of medical students. From then until today, it has been applied in evaluating different profiles of health professionals, especially nurses.

Aim. The purpose of this paper is to present scientific evidence regarding the benefits of OSCE in undergraduate nursing education. The aim of this paper is to analyse findings on the use of OSCE in undergraduate nursing education worldwide, as well as students' and educators' perception of the OSCE examination.

Methods. A systematic review of articles published in MEDLINE, regarding the use of OSCE in nursing education, and students' and educators' perception of the OSCE examination, was carried out in the period between 2005 and 2017.

Results. In total, 8 articles were taken into consideration. These studies were selected because they provided information on the use of OSCE in nursing

education worldwide and students' and educators' perception of the OSCE examination.

Conclusion. The application of OSCE has multiple benefits for nursing students. It can easily assess the knowledge and performance of clinical skills important for nursing practice. It serves to better prepare students for their professional activity.

Introduction

Nurses are the largest group of health care professionals. During their education, undergraduate nursing students should acquire skills necessary for future professional activity (1). The European Qualifications Framework describes skills as cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments) (2).

Assessment of clinical competence is an essential requirement of health professional education (3). According to Miller (1990), the assessment of the performance of clinical skills should be designed in such a way that students are tested in terms that are related to their future professional function. The template for the development of clinical skills is described in a way that outlines the four levels that must be taken into account: the student knows, knows how, shows how, and does. The first and the second level include multiple-choice questions, essays, and an oral exam; the third level includes simulation and the OSCE exam; the fourth level involves the assessment of the actual real-world environments (3, 4).

During education, nursing students learn how to perform clinical skills necessary for their future professional activity by using simulation-based learning in nursing skills demonstration rooms. Here, students encounter different equipment and materials that are required in the clinical setting. Simulation-based education can be performed on multi-functional manikins (human body or parts of the body where students can perform measurement of vital signs, urinary catheterization, injection administration, etc.). Students gain confidence in performing clinical skills in a simulated environment before performing the same skills in the actual clinical settings. They must possess knowledge of specific skills and know how to apply this knowledge into practice through proper performance of clinical skills. Educators are obliged to give students feedback on their knowledge, point to deficiencies in knowledge and give suggestions on how to improve the performance of clinical skills. Educators supervise the performance of each student and their progress in the acquisition of knowledge, skills and attitudes. For a more objective approach to the assessment of knowledge, skills and abilities of students for professional activity, educators often use the Objective Structured Clinical Examination (OSCE).

The Objective Structured Clinical Examination (OSCE) is defined as an "approach in the assessment of clinical expertise in which competencies are estimated in a well-planned and structured manner, with special attention paid to objectivity" (3, 5). The OSCE was first mentioned in 1975, when the authors Harden et al. published a paper in the British Medical lournal about the assessment of clinical competence using the Objective Structured Clinical Examination. The aim of the study was to assess the basic clinical skills of medical students through the Objective Structured Clinical Examination. The first OSCE examination was conducted at a hospital ward. The test was designed in such a way that the students had several stations where they had to perform a particular task. At each station, they received written instructions on how the task should be performed (for example: do part of the physical examination, interpret laboratory results, etc.). Students had exactly five minutes to perform a particular task. After the given time, the students had to go to the next station where they answered questions related to the previous workstation. The whole process was accompanied by examiners who were evaluating the students' performance using checklists. Students accessed between 16 and 20 workstations (5).

Performance of an OSCE

OSCE is used as a method for assessing knowledge and skills in performing clinical skills required for nursing practice. It is performed in a safe environment where certain skills can be applied to multifunctional manikins or other students through simulation or role playing. According to Milutinovic (2013), the use of OSCE in nursing education has increased in the past 10 years (6).

As previously stated, OSCE stands for:

Objectivity - educators use a predefined checklist for the evaluation of students. The checklist is written in a standardised way. It should be valid, i.e. measure knowledge of the student. Measurement should be objective (not dependent on the examiner), reliable (that is, more measurements result in the same or similar data), sensitive (allows for differentiation in the results of the variables to be measured). **Structured** - all students have the same tasks that must be solved in the same time frame. **Clinical** - tasks that are put before students are identical to actual clinical situations. **Examination** - assessment of skills using a formal test of knowledge or skills.

According to Alinier (2003), the OSCE is composed of 15-20 short exercises or stations where students rotate individually. The number of candidates taking part in the session is determined by the number of stations. The assessment period usually lasts between 3 and 10 minutes and can be alternated with short rotation intervals so that students have time to move to the following exercise (7). Adequate preparation of students is required before conducting OSCE. Preparation involves identification of students, explaining of the purpose of the examination and OSCE rules, bringing students to the initial place of testing, and the introduction to the workstations, equipment and materials. After that, the student gets clear instructions about the task that needs to be done. During OSCE, educators evaluate students' approach to the patient, their communication skills, the interaction between the student and the simulated patient. Students are expected to introduce themselves to the patient, thoroughly explain the process to the patient, obtain consent for the procedure, implement specified procedures, take care of the patient, accessories and document the entire process. Each student performs the same tasks in the same time frame. The examiner evaluates the students according to pre-set criteria thereby making the examination structured and objective (8). Educators monitor the performance of certain skills and provide feedback to students about their success in performing those skills, but also show students their mistakes and the cause of those mistakes. Students become aware of their strengths and weaknesses in performing clinical skills and get feedback on how to correct them. This guides students towards active learning, critical thinking and contributes to the development of safe practice. The OSCE assessment can be used

for formative assessment (assessment can track the performance of certain skills during the teaching process) or summative assessment (assessment can evaluate the performance of certain skills after the completion of the teaching process) (9).

Advantages of the OSCE assessment

Advantages of the OSCE assessment: this method allows for an interesting teaching process, and it also encourages students to become active participants in the learning process. It encourages the development of critical thinking and logical reasoning which results in having a competent and efficient nurse. The test is carried out in a controlled environment without compromising patient safety. Students are evaluated in a pre-defined manner to avoid the subjectivity of educators. Students learn about the tools which are used to perform a certain skill and they can develop confidence in clinical skills without compromising patient safety. According to Alinier (2003), the greatest advantage of using OSCEs are the stations. The stations can be organized in the form of mini scenarios, simulations, case studies, multiple choice questionnaires, short theoretical questions, or even rest stations to help the students relax from time to time (7).

Disadvantages of the OSCE assessment

Disadvantages of the OSCE assessment are the following: it is financially demanding, it is necessary to invest more time in the preparation and organization of the exam, it creates a competitive atmosphere and some students find it stressful.

The importance of using OSCEs as an assessment method in nursing education has been described by numerous authors:

- Our experience suggests that the OSCE may be a powerful tool in the evaluation of clinical competence in nursing and that it may also be an effective facilitator for learning to perform clinical skills in nursing (10).
- OSCEs can be used most effectively in nurse undergraduate curricula to assess safe practice in terms of performance of psychomotor skills, as well as the declarative and schematic knowledge associated with their application.
 OSCEs should be integrated within a curriculum in conjunction with other relevant student evaluation methods (3).

- An OSCE is a necessary assessment tool that should be continuously applied in nursing education, regardless of the mode of the education program, the student's years of experience or his/her clinical placement (11).
- Objective structure Clinical Examination (OSCE) is a more sophisticated examination method to assess competencies such as problem-solving abilities, critical thinking and communication skills, and has gained acceptance as a benchmark for clinical skills assessment (8).
- The OSCE is an assessment tool that can provide high-impact training to students. From its creation to the present, the Objective Structured Clinical Examination (OSCE) has been regarded as an effective assessment tool (12).
- The OSCAs were seen as a good assessment tool, which gave students the opportunity to receive feedback on their performance in relation to clinical skills (13).
- The Objective Structured Clinical Exam is designed to assess the knowledge, skills and abilities in a clinical setting. It represents an effective strategy for measuring the success of implementation of clinical skills in a safe and controlled environment (14).

- The Objective Structured Clinical Examination (OSCE) is an established tool in the repertoire of clinical assessment methods in nurse education. The use of OSCEs facilitates the assessment of psychomotor skills as well as knowledge and attitudes. Identified benefits of the OSCE assessment include development of students' confidence in their clinical skills and preparation for clinical practice (15).
- A well-designed and implemented OSCE can provide students with opportunities to demonstrate interpersonal and interview skills, problem-solving abilities, teaching, assessment skills, and application of basic clinical knowledge (16, 17).

The purpose of this paper is to present scientific evidence regarding the benefits of OSCE in nursing education. The aim of this paper is to analyse the findings about the use of OSCE in nursing education worldwide, and students' and educator' perception of the OSCE examination.



Figure 1. Flow chart of the search process of the systematic review of articles regarding "Use of the Objective Structured Clinical Examination in undergraduate nursing education"

Methods

The study is a systematic review of articles published in MEDLINE, regarding the use of OSCE in nursing education worldwide, and students' and educators' perception of the OSCE examination.

Inclusion and exclusion criteria

We included the original articles relating to countries worldwide which describe the use of OSCE in nursing education and students' and educators' perception of the OSCE examination. The inclusion criteria were also the articles written in the English language and original articles relating to specific countries worldwide with the year of publication between 2005 and 2017. We excluded the studies with the year of publication prior to 2005.

Search strategy

Literature search was carried out between January and March 2017 using the MEDLINE database. The search included the following terms: clinical competency assessment, objective structured clinical examination, nursing education, using Boolean operators "AND". Search results included 68 studies.

The first step was the analysis of the list of the titles of articles which could be potentially included, based on the keywords that were entered into the database. The second step was to analyse the articles that correspond to the title. The third step was the analysis of the abstracts that matched the title and the year of publication between the 2005 and 2017. In total, 8 full-text studies were included in this systematic review. The results of this review are displayed in tabular form.

Results

The search strategy identified 68 studies. A total of 8 studies with details about the use of OSCE in undergraduate nursing were included in this review.

Of the eight studies included in the review, one study was from Spain (12), one from Italy (18), one from the USA (16), two were from the United Kingdom (17, 19), one from Egypt (20) and two from Ireland (15, 21).

All the studies provide descriptions related to the use of OSCE in nursing education, and details about the organisation of the OSCE exam. Some of the studies provide a description of educators' (12) or students' perception of the OSCE exam (15).

Authors Solà, Pulpón, Morin, Sancho, Clèries and Fabrellas (2017) conducted a study to identify Nursing School faculty perceptions regarding the implementation of OSCE as an assessment tool. They concluded that OSCE should be administered towards the end of the degree program as a part of a multimethod evaluation strategy for student assessment. Authors stated that OSCE with adequate feedback can provide high-impact training to students (12).

Authors Bagnasco, Tolotti, Pagnucci, Torre, Timmins, Aleo and Sasso (2016) used OSCE as a method to assess communication skills using two examiners who conducted their assessment separately. They stated that OSCE proved as a useful method to assess communicative skills (18).

In most cases, the OSCE has been conducted traditionally, using paper-based methodology. Authors Meskell, Burke, Kropmans, Byrne, Setyonugroho and Kennedy (2015) pointed out the benefits of using an electronic OSCE management system which saved time, thus preventing documentation errors and providing student feedback about their performance (15).

Authors Traynor and Galanouli (2015) described the Angoff standard-setting procedures that were used to calibrate OSCE at the United Kingdom University. According to authors, it was the first OSCE in the UK to incorporate a scientific standard-setting procedure (17).

Rush, Ooms, Marks-Maran and Firth (2014) tried to identify students' experiences with OSCA with immediate feedback to students. They concluded that OSCA enhances learning and increases students' confidence (19).

Selim, Ramadan, El-Gueneidy and Gaafer (2014) tested the first application of OSCE in undergraduate psychiatric nursing education in Egypt. Authors stated that the psychiatric nursing OSCE proved to be a reliable and valid method in assessing psychiatric nursing clinical competencies (20).

| | | Table 1. | Overview of th | e articles included in the end | | |
|---|---|---|--------------------------|---|------------|---|
| AUTHORS | YEAR OF PUBLICATION COUNTRY OF PUBLICATION | ASSESSMENT | NUMBER OF RESPONDENTS | STATIONS CLINICAL SKILLS | DURATION | CONCLUSION |
| Solà M, Pulpón AM, Morin V, Sancho R, Clèries X, Fabrellas N. (12) | 2017 Catalan Nursing Schools, Spain | Summative assessment | 15 | 18 assessment stations with 14 simulated clinical situations typical of nursing practice. Some situations had a second station at which the student was asked to write a care plan proposal for the simulated patient who had been interviewed at the previous station. | 10 minutes | Authors stated that despite its high cost, OSCE was deemed to be efficient as it enables student competencies to be assessed with objective criteria, which is difficult with other instruments. |
| Bagnasco A, Tolotti A, Pagnucci A, Torre G, Timmins F, Aleo G, Sasso L. (18) | 2016 University of Genoa, Italy | Assessment of communication skills using 0SCE | 421 | 8 scenarios were used (the phases of information and communication with patients undergoing diuresis monitoring and subjects with problems of mobility, hygiene, alimentation, hydration, and arterial hypertension). Core competence requirements for each skill: the ability to collect data, identify the patient's needs and the main problems of nursing care and provide appropriate health care responses with a special focus on communication skills, as this was the principal competence requirement for the purposes of this OSCE. | 5 minutes | Authors stated that OSCE proved a useful method to assess students' communication skills. |
| Meskell P, Burke E, Kropmans TJ, Byrne E, Setyonugroho W, Kennedy KM. (15) | 2015 School of Medicine, Medical Informatics & Medical Education, College of Medicine, Nursing and Health Sciences, NUI Galway, Ireland | Using an online OSCE Management Information System (OMIS) to assess clinical skills | 203 | 4 stations A hand washing, blood pressure measurement, manual handling and a documentation station. | 5 minutes | Electronic software offering considerable time saving. The electronic method was just as effective and more efficient (less time consuming) than the traditional paper- based method. |

| | | Table 1. | Overview of th | e articles included in the end | | |
|--|--|--|--------------------------|--|---|---|
| AUTHORS | YEAR OF PUBLICATION COUNTRY OF PUBLICATION | ASSESSMENT | NUMBER OF RESPONDENTS | STATIONS CLINICAL SKILLS | DURATION | CONCLUSION |
| Traynor M, Galanouli D. (17) | 2015 School of Nursing and Midwifery, Queen's University Belfast, Medical Biology Centre, Belfast United Kingdom | The development of OSCE case scenarios and updates, the role and training of the standardised patient, and students' perceptions of the nursing OSCE experience | Oc | The first-year nursing students' OSCE includes 7 individual stations - measuring blood pressure, recording vital signs and urinalysis. In the second year, there are 10 stations which include post-operative care, recording and interpreting Glasgow Coma Scale scores. | First year nursing students' OSCE - 5 minutes Second year - 10 minutes | According to authors, the Objective Structured Clinical Examinations (OSCEs) offer the potential for highly valid and reliable assessments of clinical practice and OSCE-development benefits from a partnership between clinical mentors and nurse lecturers. |
| Rush S, Ooms A, Marks-Maran D, Firth T. (19) | 2014 Faculty of Health, Social Care and Education (FHSCE) at Kingston University and St George's University of London United Kingdom | Summative assessment with immediate feedback provided to the students. | 272 | 7 stations (temperature, pulse and respiration, blood pressure, aseptic technique, moving and handling, adult basic life support, recovery position, height, weight and Body Mass Index (BMI), fluid balance (short written paper), moving and handling (short written paper), clean technique (short written paper), clean technique (short written paper), clean technique (short written paper), clean technique for the refiten feedback by the assessor at that station and this allows students to identify how they could further refine or define the particular skill assessed at that station. | There is no time limit at any station. | The OSCAs have been successful in enhancing learning and increasing students' confidence, as well as in assessing clinical skills development. |

| | | Table 1. | Overview of th | e articles included in the end | | |
|---|---|---|--------------------------|---|-----------|--|
| AUTHORS | YEAR OF PUBLICATION COUNTRY OF PUBLICATION | ASSESSMENT | NUMBER OF RESPONDENTS | STATIONS CLINICAL SKILLS | DURATION | CONCLUSION |
| Selim AA, Ramadan FH, Gaafer MM. (20) | 2012 Faculty of Nursing, Mansoura University, Gomhuria St, Mansoura, Egypt | Assessment of psychiatric nursing students' clinical skills | 1 U | Thirteen stations were prepared including 11 working stations and 2 rest stations. The OSCE consisted of three interactive simulated patient stations (station 1, 5 and 8), post stations (2, 3, 6, 7 and 9) and the other three stations included a medication classifications and indications (4), a medication side effects (10) and a laboratory investigation results station (11). The first rest station followed station 4, while the second rest station followed station 7. Regarding the simulated patients, the scenarios were created based on real clinical cases and written in detail, including the patient's background, chief complaint, facial expression, posture and responses to student's interactions. The post stations were written assignments and/or questions regarding the simulated patient's station Post stations 2 and 3 included writing the patient's record, nursing notes and the nursing care plan based on the interview and assessment of the patient in station 1. Post stations before receiving electroconvulsive therapy based on assessment of the patient in station 5. Post station 9 dealt with writing nursing management of hallucinations based on the interview of the patient in station 8. Model answers of the previously mentioned stations were structured and reviewed for marking these stations. | 5 minutes | Authors stated that the psychiatric nursing OSCE proved to be a reliable and valid method for assessing psychiatric nursing clinical competencies. In general, the students perceived OSCE as a positive experience, but also a stressful one. |
| McWilliam PL, Botwinski C. (16) | 2010 University of New Hampshire, Durham, NH 03824, USA | Formative assessment | 60 | 10 case scenarios, and each student was randomly assigned 5. | | Authors stated that the students were overwhelmingly favourable to perceived benefits of participation in OSCEs during their nursing education. |

| | | Table 1. | Overview of the | e articles included in the end | l | |
|---------------------------|---|---|--------------------------|---|------------|---|
| AUTHORS | YEAR OF PUBLICATION COUNTRY OF PUBLICATION | ASSESSMENT | NUMBER OF RESPONDENTS | STATIONS CLINICAL SKILLS | DURATION | CONCLUSION |
| 3yrne E, Smyth S. (21) | 2008 School of Nursing and Midwifery, National University of Ireland, Galway, Ireland. | The OSCE preparation and assessment process (nurse educators' experiences) | 11 | 4 skills stations were set up in two laboratories. The competence that were assessed: measuring vital signs using a tympanic thermometer measuring vital signs using an electronic thermometer hand washing, donning and removing sterile gloves hand washing and preparing a sterile field administrating oral medication communicating with a simulated client nerforming adult CPR | 30 minutes | Authors stated that the use of OSCEs throughout the undergraduate nursing programme is recommended. Nurse educators should be involved in teaching and assessing the skills. In particular, participants believed that the anxiety students experience in an examination situation may benefit students' overall |

McWilliam and Botwinski (2010) conducted an OSCE formative evaluation of students' clinical competencies. Authors investigated the development of case scenarios and updates, the role and training of the standardised patient, and students' perceptions of the nursing OSCE experience. Students perceived benefits of participation in OSCE during their nursing education (16).

Byrne and Smyth (2008) in their study wanted to analyse nurse educators' experiences and perspectives of assessing students' clinical competence using OSCE and to address the challenges of executing the examination. Authors stated that the use of OSCE throughout the undergraduate nursing programme was recommended (21).

Discussion

In order to improve nursing education, different teaching methods are adopted to help students gain knowledge, skills and attitudes relevant for nursing practice more easily. The use of simulation-based learning helps students develop a sense of safety when performing certain tasks. The assessment of clinical skills is very important in nursing education. Therefore, OSCE is seen as a good assessment tool and an objective, valid strategy for assessing nursing students' clinical competences in a safe and controlled environment. The purpose of this paper is to present scientific evidence regarding the use of OSCE in undergraduate nursing education. OSCE can be designed as different simulated clinical scenarios or it can be implemented through role-playing using standardised patients or manikins. It is used for better implementation of theoretical knowledge in practice. The results of this study indicate that OSCE can be used for summative or formative evaluation of competences. According to Solà, Pulpón, Morin, Sancho, Clèries and Fabrellas (2017), OSCE should have a summative

performance in clinical settings. and formative purpose — enhancing the feedback received by students about their performance — and should carry weight regarding students' academic records to ensure their involvement (12). According to many authors (3, 8, 10-17), OSCE contributes to quality education for undergraduate nursing students. There are many advantages for both teachers and students. The competencies can be assessed with objective criteria (13), it is a useful method to assess students' communication skills (19), it enhances learning and increases students' confidence (19), and ensures safe practice (20). It offers the potential for valid and reliable assessments (17, 20).

The use of OSCE throughout the undergraduate nursing programme is recommended (21). Student preparation plays an important role when preparing OSCE (17). Students have reported that they perceived OSCE as a positive experience (15), and, but also a stressful one (15, 20). If students perceive OSCE as verv stressful, it can affect their effectiveness in the execution. Students verbalize a greater level of confidence in performing skills after they pass the OSCE exam (16). One of the benefits of OSCE is that educators can provide students with feedback on their performance (15). Authors Rush, Ooms, Marks-Maran and Firth (2014) stated that at the St. George's University of London, United Kingdom, OSCEs were universally disliked by students, for reasons that included absence of immediate feedback. The feedback was provided to the students after several weeks, because it was policy for results to be ratified by the examinations board before giving the final marks/ grades to students. After a while, the University rebranded OSCE as an objective structured clinical assessment (OSCA) with immediate feedback provided to students. Authors stated that OSCA with immediate feedback was perceived positively by students, was valued with regard to a number of factors, had a positive impact on student learning and confidence and was regarded as a form of assessment which the University should continue to use (19). This contributes to the satisfaction of students and raises the quality of education. Certain studies emphasize that the preparation and organization of the OSCE exam is demanding. Considerable challenges are required to ensure the validity and reliability of the process (14). Educators must assure reliability and validity of the OSCE exam. For that reason, some authors indicate the importance of using two examiners per station to achieve objectivity in the OSCE exam (14, 18). This way of testing can result in exhaustion of examiners if they have many students. Authors Traynor and Galanouli (2015) stated that from the beginning of the nursing OSCE-development process, their school involved clinical mentors in the assessment process and OSCE-development benefited from a partnership between clinical mentors and nurse lecturers (17). Different approaches have been used in implementing OSCE in the teaching process.

OSCE is used in nursing practice worldwide. For example, in Canada, internationally educated nurses (IENs) who want to apply for a nursing position in Canada, must submit the application and supporting documents to the College of Nurses of Ontario (CNO) for assessment. The College of Nurses of Ontario evaluates all international nurse applicants to determine if knowledge, skills and judgment are equal to that of a recent graduate of an Ontario undergraduate nursing program using OSCE. The (OSCE) results determine whether the applicant has demonstrated entry-to-practice competencies to meet the program requirement (22).

Conclusion

It is necessary to ensure the quality of nursing education as a basis for providing better quality care for patients and safe practice. This can be achieved by using OSCE as part of undergraduate nursing education. This study wishes to emphasize the importance of applying OSCE in the education of nurses. The application of OSCE has multiple benefits for nursing students. Some of the advantages of such an assessment are that OSCE is used to easily assess the knowledge, skills and attitudes of nursing students in a simulated clinical environment similar to a real clinical setting without compromising patient safety. The aim of this is to help nursing students to be better prepared for their future role. The use of OSCE is described in undergraduate nursing education worldwide. The application of OSCE differs in different countries.

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PRIMJENA OBJEKTIVNO STRUKTURIRANOGA KLINIČKOG ISPITA U PREDDIPLOMSKOM OBRAZOVANJU MEDICINSKIH SESTARA

Sažetak

Uvod. Objektivno strukturirani klinički ispit (OSKI) često se primjenjuje na preddiplomskom studiju sestrinstva kao sredstvo za pružanje standardizirane i objektivne procjene kliničkih vještina potrebnih za buduću profesionalnu djelatnost medicinskih sestara. Svrha je ispita OSKI pomoći studentima da ovladaju različitim kliničkim vještinama i pripremiti ih za adekvatan odgovor na specifične probleme kroz simulaciju različitih scenarija iz prakse. Studenti izvode kliničke vještine u sigurnom i kontroliranom prostoru pod nadzorom mentora. Od sredine 1970-ih godina OSKI se primjenjuje za procjenu usvojenosti kliničke vieštine studenata medicine. Od tada pa do danas primjenjuje se za procjenu znanja i vještina kod različitih profila zdravstvenih djelatnika, posebno medicinskih sestra.

Svrha rada. Svrha je rada predstaviti znanstvene dokaze o prednostima ispita OSKI u preddiplomskom sestrinskom obrazovanju. Cilj je rada analizirati podatke o primjeni ispita OSKI u sestrinskom obrazovanju u svijetu te istaknuti studentsku i nastavničku percepciju uporabe ispita OSKI.

Metode. Učinjen je sustavni pregled članaka objavljenih u bazi MEDLINE u periodu od 2005. do 2017. s temom primjene ispita OSKI u sestrinskom obrazovanju te percepcije studentske i nastavničke percepcije ispita OSKI.

Rezultati. U obzir je uzeto ukupno osam članaka. Ovi su članci odabrani jer pružaju informacije o primjeni

ispita OSKI u sestrinskom obrazovanju te nastavničkoj i studentskoj percepciji ispita OSKI.

Zaključak. Primjena ispita OSKI ima više pogodnosti za obrazovanje studenata. S pomoću njega možemo procijeniti znanje i vještine važne za sestrinsku praksu. Pomaže za bolju pripremu studenata za njihovu profesionalnu djelatnost.

Ključne riječi: OSKI, sestrinsko obrazovanje, kliničke vještine

Effectiveness of Biofeedback Therapy as Conservative Choice for Management of Female Stress Urinary Incontinence

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Keywords: stress urinary incontinence, biofeedback, women

Abstract

The *aim* of this study is to evaluate the efficacy of biofeedback (BF) therapy in females with stress urinary incontinence by a systematic review of available literature database.

Materials and methods. A search of the MEDLINE database in order to find articles related to biofeedback therapy for treating incontinence. The keywords which were used to search the database were: "biofeedback", "women", "stress urinary incontinence". Analyses included full-length, peer-reviewed articles reporting on outcomes of treatment of stress urinary incontinence (SUI) using BF in 18-year-old women and older, from any country, treated in any care setting. The inclusion criteria were that it was an original research, not older than five years and written in English.

Results. The search of the database yielded a total of 123 articles. Further analysis determined that 32 articles were suitable with respect to this study's search criteria. Finally, the analysis included 5 articles. The studies are from different parts of the world: Egypt, Poland, China, Malaysia and Japan. Two articles are from 2013 and 2015, and one was published in 2016. Three studies evaluated the efficacy of biofeedback therapy (BF therapy) versus self-performed Kegel exercises, and two studies compared biofeedback therapy with electrical stimulation.

Conclusion. Although almost all studies (4 of the 5 analysed) report a positive impact of biofeedback therapy in treating SUI, further research on a more homogeneous group, employing standardized protocols, should be conducted in the future.

Introduction

Urinary incontinence (UI) is a considerable psychological and physical morbidity a millions people worldwide suffer from today (1). It is estimated that the prevalence is between 25% and 45% (2), and it increases with age. It occurs twice more often in women than in men: 13.1% versus 5.4% (3), until the age of 80, after which the prevalence is equal for both genders (4).

The International Continence Society (ICS) defines urinary incontinence as the complaint of involuntary leakage of urine (5, 6) and suggests a classification according to the presence of symptoms and pathophysiological mechanisms of occurrence.

The most prevalent form of urinary incontinence among women, in 50% of cases, is stress incontinence (7, 8). SUI is the most common type of incontinence in women (9-12), and occurs due to increased intra-abdominal pressure during sneezing, coughing, running, laughing or exertion of some greater physical effort (7, 9). SUI affects all age groups, and occurs most commonly in women between 15 and 64 years of age (10). It is a considerable medical and social problem which reduces quality of life, especially in younger women (7), because of the stigma which still exists.

Women suffering from UI rarely seek medical support, which is especially prominent in Europe where 75% of women never sought any treatment (2), which confirms that urinary incontinence is still a taboo topic. Older women still think that UI is a normal physiological state related to the consequences of aging (5), while others believe that surgery is the only available treatment option.

As a consequence, local candida infection, cellulitis, skin irritation, insomnia and fatigue due nocturia may occur (5). Furthermore, self-image dysfunction, avoidance of social activities, traveling, recreation, and interpersonal and sexual dysfunction often occur due to embarrassment. Depression and anxiety often accompany urinary incontinence (5, 13).

Pathophysiology of Urinary Incontinence

The pelvic floor is a complex, three-dimensional mechanical system which consists of several components. The anatomical structures responsible for supporting the pelvic floor are the bony pelvis and endopelvic fascia, pelvic viscera, pelvic diaphragm, urogenital diaphragm, and levator ani muscles (14, 15).

Urine continence is defined as the ability to retain urine in the urinary bladder between episodes of voluntary micturition. Continence depends on the coordinated activity of the central and peripheral nervous system, urinary bladder muscles (detrusors) and anatomical relations between the neck of the urinary bladder and the urethra. When detrusors cannot retain urine inside the urinary bladder due to weakened function, and a patient cannot affect micturition voluntarily since urinary leakage occurs without the patient's awareness of it, then we can conclude that it is a case of incontinence. Multiple factors can cause incontinence, such as hormonal therapy, menopause, weakened pelvic muscles due to childbirth, some drugs, infections, surgical procedures undertaken on the genitourinary tract, nerve damage, BMI above 30 (5, 10, 16), and sport activities which require frequent jumping (16).

Treatments for UI

Treatment for UI includes surgery and conservative methods, and depends on the type of incontinence, seriousness of the problem and causes. Conservative methods are recommended as a first line of treatment in the management of stress, urge (7) and mixed UI (17). The available non-surgical, conservative treatment methods include lifestyle modification (a voiding diary, refraining from smoking, weight loss), Kegel exercises (exercises to strengthen the tone and contraction of pelvic floor muscles - PFM), behavioural interventions (changing behaviour to eliminate or minimize the problem, bladder training), biofeedback (use of urethral, vaginal or rectal sounding for creating visual or auditory signals when pelvic muscles are contracted), electrical stimulation and a combination of several different methods (11). Kegel exercises with biofeedback (4) or electrical stimulation (8, 18) and weighted vaginal cones (18) are usually recommended.

Non-surgical treatment for UI is effective, cheap, and easy to use in case of a milder stage of incontinence with minimal side effects. All these methods can be used in parallel with surgical methods.

Biofeedback

Biofeedback (BF) is a technique by which a patient can affect a certain physiological function by using signals from their own body, and not just those under the control of the "voluntary" nervous system, but also those under the control of the "involuntary", that is, the autonomic nervous system. Patient education on using BF requires more time, but the benefits are long-term because the patient becomes much more responsible when it comes to performing exercises when there is an objective medical finding (10). Also, BF is a non-invasive procedure in contrast with surgical treatment and it is the first option for the treatment of SUI in many cases (8).

The use of BF is based on the view that an additional stimulus in the form of feedback helps the development of motor skills (19).

BF as a method of treating incontinence consists of monitoring devices which provide feedback on PFM activity. If an internal sensor is used, the sensor is introduced into the vagina, the rectum (or both) and the urethra (19). If an external sensor is used, adhesive electrodes are placed on the skin, onto the muscle.

The purpose of those sensors is to provide women with information on the strength of contraction and relaxation of the PFM by acoustic, visual or tactile signals, which enables women to become aware of and gain control over their own contractions. This means that weaker muscles can be better activated on demand, muscles that are too tense can relax, and overall muscle activity may be coordinated in a better way. Electrodes can be placed on the abdomen, thigh or gluteus area with the purpose of checking for involuntary contraction of other muscles when feeling the urge to urinate. BF is a very useful method in promoting correct contraction control by means of visualization of muscle activity (8). BF therapy can be used as an independent method or in combination with other methods of behavioural therapy, most often with Kegel exercises (4, 8) because many women are unaware of how to contract their PFM without external signals (8), and therefore often contract abdominal or gluteal muscles. Previous study has shown that about one third of women are unable to contract the PFM voluntarily and avoid raising abdominal pressure (20).

Providing feedback on the exercise effectiveness through graphs on the monitor encourages further workouts.

BF therapy is safe and effective. Patient education may take time, but it makes the patient more responsible and less passive regarding the treatment process (10). Therapy lasts from half an hour to one hour for a period of a few weeks, and is supervised by a multidisciplinary team composed of nurses, physiotherapists and doctors (21).

The aim of this systematic review is to examine the effectiveness of BF therapy for SUI in women.

Methods

In conducting this systematic review, we searched the MEDLINE (via PubMed) database for relevant articles that investigated the effectiveness of biofeedback therapy for women with stress urinary incontinence (SUI). The keywords used to search the database were: "biofeedback", "women", "stress urinary incontinence". For better filtering of results, the terms were placed in quotation marks. The selection criteria included the following:

- full-length, peer-reviewed articles reporting on outcomes of therapy for SUI using BF in conjunction with other behavioural techniques (Kegel exercises, trans-vaginal electrical stimulation)
- studies with 18-year-old female participants and older, from any country, affected by SUI, and treated in any care setting (home, hospital, outpatient department)
- only original research published within the last 5 years, reporting on human subjects, and written in English was included
- 4. empirical studies conducted using qualitative or qualitative methods were excluded
- 5. empirical studies including women in the postpartum period, postoperative period, pregnant women, women with neurological disorders and men were excluded,

6. unpublished studies and abstracts were excluded.

The selection criteria are shown in Table 1.

During a search of the database by keywords in March 2017, 123 articles were found in total. Further analysis found that 32 articles matched the in-

| Tat | ole 1. Inclusion and exclusion criteri | a |
|--------------------|--|--|
| SELECTION CRITERIA | INCLUSION | EXCLUSION |
| | Original research | Systematic review |
| | | Review article |
| ARTICLE CATEGORY | | Report |
| | | Editorial |
| | "Biofeedback" | Postpartum |
| KEYWORDS | "Women" | Postoperative |
| KET WORDS | "Stress urinary incontinence" | Pregnant women Neurological disorders |
| DATE OF PUBLISHING | 2012-2017 | Before 2012 |
| LANGUAGE | English | All others |

clusion criteria. Randomized clinical trials referring to performing Kegel exercises with or without BF were also included in the analysis. It was important that the articles were an original study, available in full version, which resulted in 8 articles in total. Further analysis resulted in the exclusion of three articles: one investigated pharmacotherapy, another investigated the effect of BF in women with multiple sclerosis, and another investigated the influence of BF on incontinence in the postpartum period. Figure 1 shows the characteristics of the selected articles.

Results

A systematic review of literature yielded 5 articles which matched the selection criteria for a more detailed analysis. Only one study included a double-blind test. The studies are from different parts of the world: Egypt, Poland, China, Malaysia and Japan. Two articles are from 2013 and 2015, and one was published in 2016.

The analysis of the articles, description and aims of the research, methodology and results obtained are given in Table 2.



Figure 1. Flowchart of search process and selection of articles
| Table 2. Characteristics of the selected studies | | | | | | | |
|--|--|---|---|--|--|--|--|
| Author / Year Country | Title | Description and Purpose of Research | | Results | | | |
| Hirakawa et al / 2013 Japan (7) | Randomized controlled trial of pelvic floor muscle training with or without BF for urinary incontinence | To compare the effects of pelvic floor muscle training with or without BF Duration of research: 12 weeks N1=19 (Kegel exercises + biofeedback) N2=20 (Kegel exercises) | | | | | |
| | | Methodology | | | | | |
| | | A) Kings Health Questionnaire (KHQ) and International Consultation on Incontinence Questionnaire-Short Form (ICIQ-SF) | A) KHQ | N1= p<0.05 N2= p<0.05 | | | |
| | | | ICIQ-SF | N1= p<0.05 N2= p<0.05 | | | |
| | | B) Pad test | B) No significant differences between the two groups | | | | |
| | | C) A voiding diary D) Measurement of pelvic floor muscle strength by perineometry | C) | N1 <i>p</i> =0.054 N2 <i>p</i> <0.05 | | | |
| | | | D) | N1 p<0.00 N2 p<0.01 | | | |
| | | | *p<0.05 was o | considered statistically significant | | | |
| Terlikowski / 2013 Poland (10) | Transvaginal electrical stimulation with surface EMG biofeedback in managing stress urinary incontinence in women of premenopausal age: a double- blind, placebo- controlled, randomized clinical trial | To evaluate the results of conservative treatment using transvaginal electrical stimulation with biofeedback (TVES + BF) Duration of research: 16 weeks N1=64 (TVES + BF) N2=29 (Placebo TVES + BF) M2=29 (Placebo TVES + BF) M2=29 (Placebo TVES + BF) M2=0 durates (pads were weighed before and after 6 hours of use, except for the pad used during nightly sleep, which could be used all night) | A) > 0 wee p=0.3 > 8 wee p=0.0 > 16 we p=0.0 B) > po sign | 0 week N1, N2 <i>p</i>=0.324 8 week N1 <i>p</i>=0.022 16 week N1 <i>p</i>=0.024 | | | |
| | | B) Urodynamic test | B) > no sig between t before and | nificant difference was found he groups in urodynamic data l after treatment | | | |
| | | C) Incontinence quality of life questionnaire (I-QOL) | C) > 0 wee p=0.24 > 8 wee p=0.00 > 16 we p<0.0 | k N1, N2 41 k N1 04 01 | | | |

| Table 2. Characteristics of the selected studies | | | | | | | | |
|--|--|--|---|--|--|--|--|--|
| Author / Year Country | Title | Description and Purpose of Research | Results | | | | | |
| lbrahim et al / 2015 Egypt (22) | Efficacy of BF- assisted pelvic floor muscle training in females with pelvic floor dysfunction | To evaluate the efficacy of BF with Kegel exercises Duration of research: 12 weeks N1=24 (Kegel exercises + BF in clinical environment) N2=23 (Kegel exercises in home environment) | | | | | | |
| | | Methodology | | | | | | |
| | | A) Pelvic floor questionnaire (PFQ) | N1 <i>p</i> =0.029 | | | | | |
| | | B) Vaginal manometry (VM) | N1 <i>p</i> =0.023 | | | | | |
| | | | *p<0.05 was considered statistically significant | | | | | |
| Ong et al / 2015 Malaysia (23) | Using the Vibrance Kegel Device with pelvic floor muscle exercise for stress urinary incontinence: a randomized controlled pilot study | To evaluate the effectiveness of Kegel exercises performed with a new biofeedback device, compared to Kegel exercises alone Duration of research: 16 weeks N1= 19 (Kegel exercises) N2=21 (Kegel exercises + BF) Methodology | There were no significant differences between the groups at baseline, except for the total urinary score ($p=0.045$) | | | | | |
| | | A) Australian pelvic floor questionnaires (APFQ) | A) > 4 th week N2 groups showed improvement symptoms p=0.017 There were no significant differences between the groups in the following parameters: Total urinary score p=0.157 Social life score p=0.554 Bothersome score p=0.906 > 16 th week there were no significant differences between the groups p=0.982 | | | | | |
| | | B) Modified Oxford Scales for pelvic floor muscle strength (MOS) | B) > 4 th week MOS showed statistically significant differences between the groups p=0.027 > 16 th week differences stayed statistically significant p=0.03 *p<0.05 was considered statistically significant | | | | | |

| Table 2. Characteristics of the selected studies | | | | | | | | |
|--|---|--|--|--|--|--|--|--|
| Author / Year Country | Title | Description and Purpose of Research | Results | | | | | |
| Yeung et al / 2016 Kina (24) | Evaluation of treatment outcomes in pelvic floor muscle training with BF versus intra-vaginal electrical stimulation in women with urinary incontinence in Hong Kong Pamela Youde Nethersole Eastern Hospital | To evaluate the treatment outcomes and effectiveness of BF pelvic floor muscle training against intra-vaginal electrical stimulation Duration of research: 12 weeks N1=62 (intra-vaginal electrical stimulation, IVES) N2=45 (biofeedback, BF) Methodology A) Symptom analysis (SA) B) Quality of life questionnaire (KLQ) C) Pad test (PT) | A) SA : N1= $p < 0.05$: N2= $p < 0.05$ B) KLQ : N1= $p < 0.05$: N2= $p < 0.05$ C) PT number of pads used per day reduced from: : N1 from 2.4 to 1.2 or 0.05 | | | | | |
| | | | : N2 from 2.3 to 2.1 p<0.05 | | | | | |

The analysis of five different studies, conducted all over the world and published in the past 5 years, was carried out. The studies investigated the effects of BF therapy on urinary incontinence. All studies included women (n=326) suffering from urinary stress incontinence. Three studies evaluated the efficacy of biofeedback therapy (BF therapy) versus self-performed Kegel exercises (7, 22, 23), and two studies compared biofeedback therapy with electrical stimulation (10, 24).

In 2013, Hirakawa et al. compared the effects of pelvic floor muscle training with or without BF. A total of 39 participants with SUI were randomized into two groups: Kegel exercises with BF (KE + BF) or without BF (KE). By means of the King's Health Questionnaire (KHQ) and International Consultation on Incontinence Questionnaire-Short Form (ICIQ-SF), they measured quality of life as the primary outcome. A voiding diary, 1-h pad test and manometry were used to get an insight into secondary outcomes.

The difference between the primary and secondary outcomes was assessed before and after 12 weeks of exercise training. The study statistically showed that Kegel exercises, with or without BF, significantly affect the improvement of subjective symptoms (improved quality of life (p<0.05)) and objective symp-

toms (increased strength of the PFM p<0.01). The leakage volume in the 1-h pad test did not decrease in either group. The number of incontinence episodes decreased in the KE group (p<0.05). It also decreased in the KE + BF group, but the difference was not statistically significant (p=0.054). 78.2% of the women in the KE group and 69.6% of the women in the KE + BF group reported an improvement in incontinence (7).

A similar pattern and variables were explored by Ibrahim (2015) and Ong (2015), but they proved a statistically significant difference between the two groups of respondents (22, 23).

Ibrahim et al. investigated the efficacy of BF-assisted Kegel exercises in females with pelvic floor dysfunction in clinical environment in contrast with women who performed Kegel exercises independently at home. Females with neurological conditions, gynaecological or genitourinary surgery and postpartum incontinence were excluded. They proved a statistically significant difference between the investigated groups, and described that biofeedback-assisted Kegel exercises were an effective therapy compared to Kegel exercises alone. As a reason, they mentioned that BF affects the reduction of symptoms in a shorter period and allows exercising of the PFM more properly. As many as 19 (79.2%) participants of KE + BF reported improvement of symptoms after 9.7 weeks, compared to 7 participants (31.8%) who reported improvement after 11.8 weeks in KE group. Improved ability to correctly isolate the PFM contraction was reported by 15 participants from the KE + BF group, compared to only 3 participants in the KE group. Greater efficacy of biofeedback in combination with Kegel exercises, when contrasted with Kegel exercises alone, is also demonstrated by manometry, which was performed at the end of the research. Significantly greater improvement was thereby shown on part of the KE + BF group (22.3% compared to 6.1%) (22).

Ong et al. (2015) compared the effectiveness of Kegel exercises performed in combination with the new BF device to Kegel exercises alone (18). They proved that BF therapy resulted in significant early improvement of the symptoms of stress incontinence (p=0.035), and that pelvic muscle strength was significantly better (p=0.025) after 4 weeks of training. The subjective rate of improvement was similar in both groups (62.5% for KE: 61.9% for BF group), p=0.742 (23).

Yeung and associates (2016) compared how Kegel exercises + BF affect pelvic floor muscles as opposed to intra-vaginal electrical stimulation (24). Participants from the BF group achieved better results in assessing urinary symptoms, and reported greater satisfaction with life quality. This may be because BF is more comfortable than intra-vaginal stimulation, as reported by the participants. However, in the case of intra-vaginal electrical stimulation, the number of pads used per day decreased from 2.4 to 1.2, in contrast with the reduction from 2.3 to 2.1 in the BF group. The results showed that both methods were equally effective and that they do not differ in a statistically significant manner (24).

Similar results were also obtained by Terlikowski three years earlier in an investigation of the effects of trans-vaginal electrical stimulation with BF between the active and placebo groups. Using the double-blind test, Terlikowski compared the effect of trans-vaginal electrical stimulation + BF between the active and placebo groups. From the active group, 39% of participants objectively showed a reduction in the number of incontinence episodes, while in the placebo group an objective improvement was not achieved. Subjectively, 45.3% of female patients in the active group considered themselves cured, in contrast to 6.9% in the placebo group. Furthermore, 18.7% reported improvement in contrast to 13.8% in the other group. 26.6% of the participants in the active group reported unchanged status versus 48.3% in the placebo group. Worsening of symptoms was reported by 9.4% in the active group versus 31% of the female patients in the other group (10).

Discussion

Considering that conservative methods improve the initial state in a significant percentage and increase satisfaction with the quality of life, they have been recommended as the first option for treatment of urinary incontinence. One of the most widely studied methods is BF therapy, either as a sole treatment or in combination with other treatment methods.

BF is a useful method because it uses visual, auditory, or tactile signals to give feedback and promotes correct contraction and visualization of muscle activity, because many women are unaware of how to contract their muscles.

It has been proven that BF has a positive effect on motivation and that it encourages constant exercise of pelvic muscles (8, 25). Furthermore, women in assisted BF therapy achieve results which are almost double compared to self-conducted Kegel exercises (26). It should be noted that it is very important to perform the exercises correctly because the likelihood that positive results will last for the next 10 years is increased by 66% if Kegel exercises in the initial stage are successfully and positively evaluated (27).

Past research which compared exercises designed for strengthening PFM with or without BF therapy showed different data related to success and effectiveness. While some studies reported significantly greater improvement and a decrease of symptoms of urinary incontinence after BF therapy, others did not note significant differences which would confirm this theory (7, 10, 22-24).

For the past 30 years, many studies have been conducted to prove the efficacy of BF therapy in the treatment of urinary incontinence. Berghmans conducted the first larger study in the mid-1990s. The author found that BF in combination with Kegel exercises does not significantly improve the symptoms of incontinence when compared to self-performed Kegel exercises (60%:53%) (12) by performing a systematic review of the literature published in the period of 1980-1996 and conducting a qualitative meta-analysis. This is contrary to the analysis by De Kruif, Wegan and Weatherall who determined that combined BF therapy is more efficient than individual Kegel exercises (28, 29). De Kruif et al. searched MEDLINE and Excerpta Medica and then compared six studies which described PME alone to PME combined with BF. Of these 6 studies. 2 reported statistically significant differences between groups on any outcome measure. The other studies described better outcomes for the BF groups, but authors considered that results were not statistically valid (28). Weatherall performed a quantitative meta-analysis based on the systematic review by Berghmans et al., Burns et al. and Glavind et al. using the number of cured patients as an outcome. Data identified in a previous systematic review were subjected to pooled analysis of odds ratios for the size and variability of each trial. Weatherall identified different conclusions from those in the systematic review mainly due to insufficient power to detect differences in the individual trials, a limitation partially ameliorated by quantitative meta-analysis (29).

Barbosa with her associates (2011) conducted a systematic review of literature and analysed Berghmans's and two more studies and reached the same conclusion: Kegel exercises are equally effective with or without BF (30).

Pages et al. (2001) compared and analysed individual BF training with group psychological therapy program on the sample of forty women with SUI for 12 weeks. Both therapies were shown to be equally effective in reducing nocturia, but BF therapy resulted in a better subjective outcome (62%) as opposed to the psychological therapy group (28%) (31).

Fitz et al. (2012) proved that Kegel exercises in combination with BF improve pelvic floor muscle function, reduce urinary symptoms and improve the quality of life (32), while Yoo (2011) evaluated the efficacy of BF therapy combined with Kegel exercises for urinary incontinence three months after the completion of treatment (33). Successful therapy meant that no additional treatment was needed, but if a surgical procedure was required after BF therapy,

the treatment was evaluated negatively. The study employed a retrospective analysis of the clinical data of 86 women. Treatment was successful for 57% of women who required no further therapy by other methods (33).

Different, non-standardized BF devices, different outcome measures, different measurement methods and indicators of the strength of particular muscle groups, different methods of education and conducting Kegel exercises (individually, in a group, at home or in clinical environment), and different periods of follow-up are just some of the deficiencies and unevenness in results of the same method and different authors.

BF therapy is less time-consuming and more private, but it is more invasive and costly, which is the reason why women disliked this method. The second reason is the use of a vaginal device which is unpleasant for many women (34-36). A non-vaginal device, such as transabdominal ultrasound, may be required in the future (37) because some authors reported pain while training because of the use of tampons or diaphragms, especially in middle-aged and elderly women who were not accustomed to using tampons and diaphragms (34, 36).

In future similar research, the focus should be on BF standardization, in a more homogeneous group because it is difficult to determine the relative effectiveness of BF and Kegel exercises on different outcome measures. Further studies with larger samples designed to consider frequency and duration of follow-up, as well as adherence, are necessary.

Conclusion

The findings of this systematic review have demonstrated that correctly taught BF combined with Kegel exercises and electrical stimulation are an effective treatment for the majority of patients with SUI. The evidence has demonstrated that the combination of BF and Kegel exercises is the best non-surgical treatment for SUI. Out of a total of 5 analysed articles, 4 of them showed that BF, as an additional method, has a positive effect on the increase of pelvic floor muscle strength and thus on the reduction of involuntarily urination. Only one study suggested that no additive effect of BF training was found and that there were no differences in the outcome between the PFM training with or without BF, and the authors thought that BF was not necessary as a standard add-on treatment.

BF is useful as an adjunct for strengthening PFM, as well as its volume and function. The use of sophisticated equipment such as various BF devices achieves significantly better results in a shorter period of time and is proven to affect the patient's motivation.

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DJELOTVORNOST BIOLOŠKE POVRATNE SPREGE (BIOFEEDBACKA) KAO KONZERVATIVNE METODE LIJEČENJA STRESNE URINARNE INKONTINENCIJE KOD ŽENA

Sažetak

Cilj je ovog rada sustavnim pregledom literature utvrditi svrhu i djelotvornost primjene biološke povratne sprege (engl. *biofeedback*) kod liječenja stresne inkontinencije.

Materijali i metode. Pretraživanjem baze podataka MEDLINE pronađeni su članci povezani s metodom liječenja inkontinencije *biofeedbackom*. Ključne riječi prema kojima se pretraživala baza bile su: *"biofeedback"*, *"žene"*, *"stresna urinarna inkontinencija"*. U analizu su bili uključeni samo recenzirani, u cijelosti objavljeni članci, s rezultatima liječenja stresne urinarne inkontinencije (SUI) s pomoću *biofeedbacka* kod žena u dobi od najmanje 18 godina, iz svih dijelova svijeta, bez obzira na to u kojem se okuženju odvijala terapija. Kriteriji uključivanja bili su izvorna istraživanja ne starija od pet godina i pisana na engleskom jeziku.

Rezultati. Pretražujući bazu s ključnim riječima pronađena su ukupno 123 članka. Daljnjom analizom utvrđeno je da ih 32 odgovara kriterijima pretraživanja. U konačnu analizu uvršteno je pet radova. Analizirane studije bile su iz različitih dijelova svijeta: Egipat, Poljska, Kina, Malezija i Japan. Dva su članka iz 2013. i 2015. godine, a jedan iz 2016. godine. Tri studije procjenjivale su učinkovitost terapije *biofeedbackom* u usporedbi s Kegelovim vježbama, a dvije studije u usporedbi s elektrostimulacijom.

Zaključak. Iako gotovo sve studije (četiri od pet analiziranih) izvještavaju o pozitivnom utjecaju terapije *biofeedbackom* u liječenju stresne inkontinencije, potrebna su daljnja istraživanja na homogenijoj skupini i sa standardiziranim protokolima.

Ključne riječi: stresna urinarna inkontinencija, *biofeed- back*, žene

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Acknowledgments

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