University of Applied Health Sciences Croatian Nursing Council







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Monitoring in the Treatment of Patients with Aneurysmal and Nonaneurysmal Subarachnoid Haemorrhage in Terms of Nursing Care and Therapy

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Keywords: subarachnoid haemorrhage, aneurysm, monitoring, neurosurgical nurse pre and postoperative care, vasospasm, nosocomial infections and complications

Abstract

Cerebrovascular diseases together with cardiovascular and malignant diseases are the most common diseases in the developed world, regardless of the gender. They are at the third place as the cause of mortality and first as the cause of disability.

Subarachnoid haemorrhage is a condition of discharging blood from cerebral arteries into the subarachnoid space within the brain. Subarachnoid haemorrhage (SAH) has a number of etiological features, but when it comes to spontaneous subarachnoid haemorrhage, in 80% of the cases it is caused by the rupture of an intracranial aneurysm. Subarachnoid haemorrhage (SAH) can be spontaneous and traumatic (post-traumatic). Also, it could be primary (direct bleeding into the subarachnoid space) or secondary (parenchymal bleeding to the subarachnoid space of the brain).

Cerebral aneurysms are a local expansion in the blood vessel wall usually at the bifurcation of the artery. If cerebral artery ruptures and blood enters the subarachnoid space, the patient can have a very strong headache at the back and front part of the head. Short term memory can be affected as well.

The initial assessment of patients should include: an overview of the quantitative state of mind, pupil size and reaction to light, motor and sensory function, the presence of headaches, dysfunction of cranial nerve (ptosis of the eyelids, difficulty moving eyes in all directions) blurred vision, aphasia, other neurological deficits). Several serious complications often arise after a successful operative treatment of the subarachnoid haemorrhage and aneurysm. One such complication is cerebral vasospasm, and is present in 50 to 70% of the patients. Late complications include recurrent bleeding, brain edema, chronic hydrocephalus and as most important – brain infarction.

The incidence of subarachnoid haemorrhage ranges from 10-15/100 000 inhabitants. About 20% of the patients with spontaneous subarachnoid haemorrhage are younger than 45 years, while patients older than 70 years have a less positive prognosis of survival. Spontaneous subarachnoid haemorrhage is a disease of the middle age (55-60 years) with a relatively high mortality and morbidity. The prevalence of patients with an intracranial aneurysm is unknown, but it is assumed to be of higher incidence than subarachnoid haemorrhage. Approximately 10-15% of the patients die before they reach the physician, 10% die within the first few days, while the mortality rate in patients with all forms of subarachnoid haemorrhage is up to 45%.

Morbidity is significant, considering that 66% of the patients never return to their earlier work, nor they have the same quality of life. Most patients with subarachnoid haemorrhage are subjected to a microneuro-surgical treatment.

In monitoring the patients and depending on the complications, but also in all situations, the role of nurses is primarily reflected in monitoring vital parameters and states of consciousness, and recognizing the signs and symptoms of neurological deterioration of the patient.

Hypothesis. Patients with proper postoperative nursing care, monitoring and rehabilitation, with aneurysmal and nonaneurysmal subarachnoid haemorrhage, have fewer complications such as neurological deficits, pressure ulcers, nosocomial infections, changes in the values of the vital parameters and biohumoral status.

Research Objectives. To show the total number of operated patients with confirmed subarachnoid haemorrhage at the Department of Neurosurgery, University of Sarajevo Clinical Centre during the period from 1 January 2013 to 31 December 2014. To show the ways in which the patients were monitored from admission to discharge from the Department. To show the stages of the patients' progress along with the outcome of the treatment strategy. To show quality indicators (ventilator-associated pneumonia, nosocomial infections, pressure ulcers) in the test sample.

Research Method. The research was a retrospective study. A descriptive analytical method was used which compared the data from the patient medical histories that included physicians and nurses' notes for patients that were operated on at the Department of Neurosurgery, University of Sarajevo Clinical Centre. The sample included patients of both genders with a confirmed diagnosis of subarachnoid haemorrhage (aneurysma cerebri, haemorrhagia subarachnoidalis spontanea) who were operated on at the Department of Neurosurgery, University of Sarajevo Clinical Centre, in the period from 1 January 2013 to 31 December 2014. Of the 142 respondents, 93 or 65.5% were hospitalized for aneurysmal surgery and a control group of 49 of them, or 34.5%, were operated on for nonaneurysmal subarachnoid haemorrhage. There were 50.7% of men (n=72), and 49.3% of women (n=70). The participants in the study were of the average age of 54 years or 45-63.2 years. The study did not include the education and occupation of the participants.

Criteria for inclusion into the study: Patients with a confirmed diagnosis of subarachnoid haemorrhage; patients operated on during the abovestated period; people older than 18 years.

Criteria for exclusion from the study: Patients who were in the abovestated period diagnosed with the same illness and have not undergone surgery, but underwent conservative neuroradiological treatment (embolization).

Results. Of the 142 respondents in the sample, 65.5% were hospitalized for aneurysmal surgery and 34.5% of the patients were operated for nonaneurysmal subarachnoid haemorrhage. The respondents were on average 54 years old. Men were on average 53 years and women 55 years old. Aneurysmal subarachnoid haemorrhage was more frequent among women (65.6%). The respondents with nonaneurysmal subarachnoid haemorrhage were older, 61 (43-62) years. Only 2% of the patients after aneurysm surgery were not under non-invasive monitoring, while the percentage of those with surgical treatment of nonaneurysmal subarachnoid haemorrhage was significantly higher at 24.5%.

There was a fatal outcome in a total of 30 (32.6%) patients operated on for an aneurysm while the percentage of those who were operated on due to nonaneurysmal haemorraghe was lower and amounted to 4 (8.2%). Surviving patients, those with an aneurysm, on average stayed in hospital for 18 (12-24) days. Of the total number of patients operated for an aneurysm – 44 (47.3%) were independently mobile after surgery, 9 (9.7%) had limited mobility, 8 (8.6%) had very limited mobility and 32 (34.4%) were immobile.

Most participants operated for subarachnoid haemorrhage were independently mobile after surgery 32 (65.3%), 10 (20.4%) had limited mobility, 3 (6.1%) had very limited mobility and only 4 (8.2%) were immobile. Of the entire sample with aneurysmal haemorrhage, ventilator-associated pneumonia was found in 9 patients (9.7%) who were operated for an aneurysm and in 2 patients (4.1%) after SAH surgery.

Introduction

Neurosurgery is a very complex and specific surgical branch which because of its complexity requires a high degree of specific knowledge and skills in the field of nursing care (1). Subarachnoid haemorrhage (SAH) is the result of bleeding into the subarachnoid space, the space between the brain membranes. Subarachnoid haemorrhage has a number of etiological features, but when it comes to spontaneous subarachnoid haemorrhage, in 80% of the cases it is caused by a rupture of an intracranial aneurysm (1). Intracranial aneurysms are local expansions in the blood vessel wall usually at the bifurcation of the artery (2). Aneurysmal subarachnoid haemorrhage is indeed a separate entity for its specific etiology and severity of clinical outcome, high rates of morbidity and mortality, characteristic complications related to secondary brain phenomena, and comprehensive therapeutic approach, which implies the almost inevitable microneurosurgical or endovascular treatment (3).

The role of the neurosurgical nurse as one link in a large team of health care professionals involved in the treatment of these patients – in the care and monitoring of the patients with intracranial haemorrhage – is great, unquestionable and well-defined, and to some extent very specific (3). Intracranial aneurysm with and without subarachnoid haemorrhage is a significant health problem. The overall incidence is approxi-

mately 9/100 000 inhabitants with a broad range, and in some countries, 20/100 000. The incidence is much higher in Finland (19.7 per 100 000 inhabitants) and Japan (22.7 per 100 000 inhabitants), but not Eastern and Central America (4.2 per 100 000 inhabitants). Ruptured aneurysms are the most common cause of spontaneous subarachnoid haemorrhage (about 85% of the cases). On average, 8% to 12% of the patients with sudden headache have SAH.

The mortality rate with conservative treatment during the first months is 50-60%. Morbidity is significant and 66% of the patients never return to their earlier work, nor have the same quality of life (4). About one third of most of the patients with untreated aneurysm will die of recurrent bleeding within 6 months after the first bleeding (5). Studies name the following risk factors for the formation of an aneurysm and subarachnoid haemorrhage: smoking as the most common risk factor, and as less common – consumption of alcohol, hypercholesterolemia and diabetes. Data on hypertension as a risk factor is currently controversial (6).

Subarachnoid haemorrhage can be spontaneous and traumatic (post-traumatic). Also, it can be divided into primary (direct bleeding into the subarachnoid space), or secondary (parenchymal bleeding entering the subarachnoid space of the brain) (7).

The initial assessment of patients includes: an overview of the quantitative state of mind, size of the pupils and reaction to light, motor and sensory function, the presence of headaches, dysfunction of cranial nerves (ptosis of the eyelids, difficulty moving the eye in all directions), blurred vision, aphasia, other neurological deficits (8).

Several serious complications often arise after a successful operative treatment of subarachnoid haemorrhage and aneurysm. One such complication is the cerebral vasospasm, occurring in 50 to 70% of the patients (9). Cerebral vasospasm occurs 3-4 days after the beginning of subarachnoid haemorrhage and reaches its maximum between days 7 and 10. About 50% of these patients suffer from severe neurological symptoms such as decrease in strength, loss of consciousness, loss of ability to speak. Late complications include recurrent bleeding, brain edema, chronic hydrocephalus and the most severe – infarction of the brain (10).

Due to the continuous contact with the patient, the neurosurgical nurse has the responsibility to create a

baseline assessment and notice the subtle and acute changes in patients with subarachnoid haemorrhage.

At the moment of the patient admission in the intensive care unit, preoperative preparation is to ensure the best possible physical, psychological, social and spiritual readiness for surgical intervention. This is the objective for all members of the health care team. Neurosurgeon and a nurse obtain informed consent from the patient, if their state of mind allows for it, or from a close family member (1).

The nurse should include the patient in the planning and implementation of nursing care, which will help the patient gain confidence, ask questions, express their insecurity and fears, all of which contributes to the successful preparation for the neurosurgical intervention. Nursing care of neurosurgical patients in the early postoperative period is focused on the monitoring of the patient's condition and recognition of complications (1).

The incidence of subarachnoid haemorrhage ranges from 10-15/100 000 inhabitants. About 20% of patients with spontaneous subarachnoid haemorrhage are younger than 45 years, while patients older than 70 years have poorer outcomes. Spontaneous subarachnoid haemorrhage is a disease of the middle age (55-60 years) with a relatively high mortality and morbidity (11). The prevalence of patients with intracranial aneurysms is unknown, but it is assumed there is a higher incidence of subarachnoid haemorrhage. Among European countries the largest incidence is in Finland, 15,1-29.8/100 000 inhabitants, and the lowest in France, 2.2/100 000. Approximately 10-15% of the patients die before they reach the physician, 10% die within the first few days, while the mortality rate in patients with all forms of subarachnoid haemorrhage ranges at 45% (12).

In the monitoring and care of these patients there are specific requirements depending on whether it is a pre or postoperative period, and depending on the resultant complications but also in all situations, the role of the neurosurgical nurse is primarily reflected in the monitoring of vital parameters and conditions of consciousness, and in recognizing the timing of clinical neurological deterioration (13).

Neurosurgical nurses in a neurosurgical unit, intensive care and step-down neurosurgical unit use the following methods: Neurological assessment:

- 1. pupils: isocoric, anisocoric;
- 2. tightness of the neck muscles;
- 3. expression and understanding of speech;
- asymmetry of the face, extremities, gait disorder;
- cognitive alteration (memory, appropriate conversation, understanding of general concepts and situations).

Monitoring of vital parameters:

- 1. oxygen saturation, blood pressure;
- 2. cardiac rhythm and frequency;
- 3. body temperature;
- 4. respiratory rate.

The assessment of the states of consciousness as well as identifying the occurrence of a neurological deficit by a neurosurgical nurse are extremely important features in the accurate and rapid treatment by a neurosurgeon that often saves life of the patients (14).

Diagnosis of subarachnoid haemorrhage

The diagnosis of subarachnoid haemorrhage is based on the characteristics of specific clinical symptoms:

- unusual intense headache "the worst headache ever", consequently, the loss of consciousness, nuchal rigidity, all signs of increased intracranial pressure;
- blood thinged intracranial fluid;
- confirmation of blood in subarachnoid spaces by CT.

It is estimated that 8% to 12% of the patients with a sudden headache have SAH. Most cases are confirmed by unenhanced computed tomography. In patients with a negative CT scan, lumbar puncture is performed in order to search for evidence of hemoglobin in the cerebrospinal fluid (15).

In the late 1980s – and early 1990s – it was estimated that about 2% of the patients with subarachnoid haemorrhage had normal findings by a CT scan of the

brain if performed within 12 hours from the beginning of the headache (16). Only 3% of the patients with subarachnoid haemorrhage had a negative computed tomography in the first 24 hours. Today, the lumbar puncture is performed when the scan is normal, and the patient had a sudden intense headache that suggests subarachnoid haemorrhage (17).

Catheter angiography, as an additional method, should be performed in patients with negative CT findings and suspicious lumbar puncture, especially in the presence of blood in the spinal fluid (18).

In patients with unproven aneurysm as a cause of subarachnoid haemorrhage angiography should be repeated to detect a potential source of bleeding and to prevent recurrence of bleeding (19).

Clinical characteristics of subarachnoid haemorrhage

Cerebral aneurysms are a local expansion in the blood vessel wall usually at the bifurcation of the artery. If cerebral artery ruptures and blood enters the subarachnoid space, the patient can have a very strong headache at the back and front part of the head. It can also cause a short-term loss of consciousness (20). If blood enters the brain parenchyma and basal ganglia it can affect the state of awareness, and can lead to a state of deep coma and rapid lethal outcome. If the awareness is preserved, headaches become diffuse. Further clinical state depends on the course of the disease, which depends on other changes, such as the occurrence of vasospasm, recurrent bleeding, the condition of the cardiovascular system, the patient's age and other (21).

The initial assessment of patients includes: an overview of the quantitative state of mind, size of the pupils and reaction to light, motor and sensory function, the presence of headaches, dysfunction of cranial nerve (ptosis of the eyelids, difficulty when moving the eyes in all directions), blurred vision, aphasia, other neurological deficits (22).

Complications after haemorrhage surgery

Subarachnoid haemorrhage can lead to devastating outcomes for patients, including the cognitive decline, cerebral vasospasm, and slow cerebral ischaemia.

The main mechanisms that contribute to the expansion of the injury after subarachnoid haemorrhage are poorly understood, therefore, the number of the efficient pharmaceutical treatment options are limited (23). Peripheral immune cells are recruited and activated in the damaged tissue. Those cells can enter the brain parenchyma and release anti-inflammatory cytokines.

Several serious complications often arise after a successful surgical intervention of subarachnoid haemorrhage and aneurysm. One such complication is cerebral vasospasm, occurring in 50 to 70% of patients (24). These patients suffer from a neurological symptom known as cerebral infarction or Delayed Ischemic Neurological Deficit (DIND). About 30% of the patients die from this complication. However, effective treatment of vasospasm is limited. The main pathogenic factor of cerebral vasospasm is the reduction of nitrous oxide and activation of the vasoconstrictor (25). Cerebral vasospasm occurs within 3-4 days from the beginning of subarachnoid haemorrhage and reaches its maximum between days 7 and 10. About 50% of these patients suffer from severe neurological symptoms such as decrease of consciousness to tongue paresis (26). Delayed complications include recurrent bleeding, brain edema, chronic hydrocephalus and as the most severe - infarction of the brain (27).

Treatment and prognosis

The treatment of subarachnoid haemorrhage includes early ligation of the aneurysm or insertion of the stent (clip) (28). The conservative postoperative treatment generally involves the prevention of complications, such as cerebral ischaemia. To prevent vasospasm, different pharmaceutical agents are used such as calcium channel blockers, magnesium sulphate, the statin agent, endothelin antagonists, and the nicardipine implants with extended releaese. However, their effects are limited and there are currently underway various studies about new drugs and treatments (29). The outcome of the disease is influenced by multiple immutable factors and factors that can be influenced by therapeutic interventions and their management. Of great importance in the postoperative recovery is the role of a neurosurgical nurse and physiotherapist with the aim to increase the patients' motor and cognitive functions (30).

Role of neurosurgical nurse in care of neurosurgical patients

Due to the continuous contact with the patient, the nurse has the responsibility for the basic assessment and ability to recognize the subtle and acute changes in patients with subarachnoid haemorrhage. Nursing care of neurosurgical patients in the early postoperative period is focused on monitoring the patient's condition, eliminating or reducing physical symptoms and early symptom recognition (1).

The work of nurses in a neurosurgical unit includes the following:

- knowledge of the patient's medical history,
- monitoring of certain diagnostic parameters,
- organization of care in the postoperative period,
- monitoring of specific parameters such as color and appearance of the skin,
- monitoring vital signs (blood pressure, pulse, oxygen saturation, temperature – in order to recognize early signs of shock which include tachycardia, filiform pulse, decreased blood pressure, paleness, cold sweaty skin, restlessness),
- monitoring the need to replace the fluids (decreased level of sodium and chloride can cause nausea, drowsiness and coma, and reduced levels of potassium result in confusion),
- observation of the neurological and psychological state of the patient (verbalisation of events and understanding spoken words depending on whether deficits were present before surgery and that part of the brain is functional),

 physiotherapy – the nurse can advise the patient to use the affected limb in daily activities, applying passive exercises ensuring the adequate position, using special aids if such aids are part of the program, and assist the patient to remain mobile. A nurse often gives emotional support when the patient is confronted with the loss of bodily functions (1).

Any sort of change should be documented in the nursing care plan. The changes in the patient care need to be documented as well, and care and support for patients and their family members should be continually provided (1,31).

The neurological assessment is done periodically and ranges from 15 minutes to 4 hours, which depends on the clinical state of the patient (1). The nurse should include the patients in the planning and implementation of nursing care, which will also help them gain confidence, ask questions, express their insecurity and fear, all of which contributes to the successful preparation for a surgical intervention (1).

Hypotheses

Patients with proper postoperative nursing care, monitoring and rehabilitation, with aneurysmal subarachnoid haemorrhage and nonaneurysmal haemorrhage, have fewer complications such as neurological deficits, pressure ulcers or nosocomial infections.

Methods

Respondents: The sample included patients of both genders with a confirmed diagnosis of subarachnoid haemorrhage (aneurysma cerebri, haemorrhagia subarachnoidalis spontanea), that were operated on at the Department of Neurosurgery, University of Sarajevo Clinical Centre, in the period from 1 January 2013 to 31 December 2014. The research included 142 respondents (patients) at the Department of Neurosurgery. There were 50.7 % of men (n=72), and 49.3 % of women (n=70). The participants in the study were of the average age of 54 years or 45-63.2 years. The study did not include the education and occupation of the participants.

Criteria for inclusion into the study: Patients with a confirmed diagnosis of subarachnoid haemorrhage, patients operated on during the abovestated period, people older than 18 years.

Criteria for exclusion from the study: Patients who were in the abovestated period diagnosed with the same illness and have not undergone surgery, but underwent conservative or neuroradiological treatment (embolization).

Working methods: The research was a retrospective study. A descriptive analytical study was used to compare the data from the patients medical histories and temperature lists who were operated on at the Department of Surgery, University of Sarajevo Clinical Centre.

For the purposes of research, demographic variables were used (age and gender), then, diagnosis, risk factors, surgical treatment, admission time in intensive care, physical therapy, length of hospital stay, complications, recovery, disease outcome.

Statistical and data processing: For statistical and data analysis we used a software package SPSS for

Windows (version 19.0, SPSS Inc., Chicago, Illinois, USA) and Microsoft Excel (version 11, Microsoft Corporation, Redmond, WA, USA).

Nominal and ordinal variables in the research were analyzed using the χ^2 test, and for the lack of the expected frequencies we used the Fisher's exact test (for contingency tables). The relationship between two continuous variables was examined using a linear equation and a scatter diagram, and the strength was evaluated with R2. The level of statistical significance was set at *p*=0.05.

Results

The average age (median) of the respondents was 54, that is, between the ages of 45 and 63.2. The youngest subject was 21 and the oldest 90 years old.

Aneurysm is more common in women when compared to men – 65.6% as opposed to 34.4%. In nonaneurysmal subarachnoid haemorrhage this ratio is



Chart 1. Gender structure in relation to diagnosis

Table 1. Age structure of respondents									
							Percentiles		
	Ν	mean	SD	Min.	Max.	25th	50th (median)	75th	
Age (years)	142	53.94	16.307	21	90	45	54	63.25	

different. Men are represented by 81.6% and women by 18.4%.

The difference in the ratio of men and women with regards to diagnosis is statistically significant χ^2 =28.6, *p*=0.0001.

Respondents with aneurysmal subarachnoid haemorrhage are on average younger – 53 years (45-51), than the patients with nonaneurysmal subarachnoid haemorrhage – 61 years (43-78).



Chart 2. The age structure in relation to the diagnosis/surgery

The percentage of the respondents with preserved consciousness is even at 39% after the aneurysmal haemorrhage surgery, compared to 36.7% of the respondents with nonaneurysmal subarachnoid haemorrhage. In the category of the somnolent patients there is a higher percentage of patients with nonaneurysmal subarachnoid haemorrhage - 28.6%, with respect to the 20.4% of the patients with aneurysmal haemorrhage. The difference is evident in the category of patients with sopor where there is a significantly higher representation of patients after the surgery of subarachnoid haemorrhage -24.5%, compared to the patients after the aneurysm surgery - 10.8%. The reverse situation can be seen in the category of coma, where there is a much higher number of patients after the operated aneurysmal haemorrhage surgery – 29.0%, compared to the patients after the nonaneurysmal subarachnoid haemorrhage surgery - 10.2%.

After the surgery the verbal response of the respondents was investigated within five categories. In both groups of respondents the highest percentage of respondents were responsive – 37.6% after the surgery of aneurysmal and 28.6% after the surgery of nonaneurysmal subarachnoid haemorrhage. There were approximately 14% of disoriented respondents after aneurysmal subarachnoid haemorrhage. There was a significantly higher percentage of confused patients (24.5%) after the surgery of nonaneurysmal subarachnoid haemorrhage for confused patients after aneurismal subarachnoid haemorrhage for confused patients after aneurismal subarachnoid haemorrhage for patients after aneurisma subarachnoid haemorrhage for patients after aneurisma subarachnoid haemorrhage for patients after a



Chart 3. State of consciousness in relation to the diagnosis/surgery

surgery (16.1%). Every third respondent (32.3%) did not answer questions after aneurysmal surgery, while the number is twice as smaller after the surgery of nonaneurysmal subarachnoid haemorrhage (16.3%). There were no patients with motor dysphasia after aneurysmal surgery while after the surgery of nonaneurysmal subarachnoid haemorrhage that number was significantly higher at 14.3%.

The table shows the share of respondents with different degrees of neurological deficit in relation to the operation. The category of nonaneurysmal subarachnoid haemorrhage is dominated by patients with hemiparesis at 40.8%, followed by patients with nausea at 28.6%, hemiplegia in 14.3% of the patients, and then patients without any neurological deficit at 10.2%, and only 6% of the patients which are immobile.

Among respondents after aneurysmal subarachnoid haemorrhage surgery the most common are those with no neurological deficit at 27.5%, then the respondents experiencing weakness at 23.1%, immobile respondents at 20.9%, and respondents with hemiparesis at 17.6% and hemiplegia at 11%.

Only 2% of the patients after the aneurysmal subarachnoid haemorrhage surgery were not monitored (continuous monitoring of the vital signs: heart rate, systolic and diastolic pressure, saturation, respiration, temperature and intracranial pressure (ICP), while the share of such patients after the nonaneurysmal subarachnoid haemorrhage surgery was significantly higher – 24.5%.

The average time spent in the hospital is statistically different between these two groups, p=0.001. For the respondents with aneurysmal subarachnoid haemorrhage the average hospital stay was 18 (12-24) days, as opposed to those with nonaneurysmal subarachnoid haemorrhage where the average length was 9 (7-12) days.

In the group of respondents who were operated on for an aneurysm the values of systolic blood pressure were 120 (110-140) mmHg, whereas in the group of respondents operated on for subarachnoid haemorrhage the systolic blood pressure values were 120 (110-130) mmHg. Values of pressure were even at p=0.932. In both groups the average values ranged within the limits of the reference range.

		Table 2. V	Verbal respons	se in relation	to the diagn	osis/surgery	1	
	Respo	nsivo		١	/erbal response			
	Disorie	ented	Confused	Does not answer	Motor dysphasia			Total
N	Apourvem	N	35	13	15	30	0	93
nosi	Alleurysiii	%	37.6	14	16.1	32.3	0	100
iag	CVII	N	14	8	12	8	7	49
	ЭМП	%	28.6	16.3	24.5	16.3	14.3	100
	Total	N	49	21	27	38	7	142
	%	34.5	14.8	19	26.8	4.9	100	

Table 3. Neurological deficit in relation to the diagnosis/surgery

	Without							
	deficit Weakness		Hemiparesis	Hemiplegia	Immobile			Total
N.	Apourvem	Ν	25	21	16	10	19	91
nosi	Alleurysiii	%	27.5	23.1	17.6	11	20.9	100
liagi	CVH	Ν	5	14	20	7	З	49
	SAN	%	10.2	28.6	40.8	14.3	6.1	100
		Ν	30	35	36	17	22	140
	Total %	21.4	25	25.7	12.1	15.7	100	



Chart 4. Monitoring of patients after the aneurysmal and nonaneurysmal subarachnoid haemorrhage surgery



Chart 5. Length of hospital stay after aneurysmal and nonaneurysmal subarachnoid haemorrhage surgery

In the group of respondents who were operated on for aneurysmal subarachnoid haemorrhage the values of diastolic blood pressure were 70 (60-80) mmHg, while in the group of respondents operated on for nonaneurysmal subarachnoid haemorrhage the values of pressure diastolic were 70 (60-80)



Chart 6. The average values of systolic pressure after the subarachnoid haemorrhage surgery

mmHg. Values of pressure were even at p=0.619. In both groups the average values ranged within the limits of the reference range.

In the group of respondents operated on for an aneurysm the average number of respiration per minute amounted to 18 (16-19), while in the group of patients



Chart 7. The average values of diastolic pressure after the subarachnoid haemorrhage surgery

operated on for subarachnoid haemorrhage the average respiratory rate was 18 (18-20) mmHg. In both groups the average values of respiration per minute were within the limits of the reference range (12-20).

In respondents that were treated surgically for an aneurysm the average value of pulse was 79 (74-90)/



Chart 9. The average values of pulse after aneurysmal and nonaneurysmal subarachnoid haemorrhage surgery



Chart 8. The average values of respiration after aneurysmal and nonaneurysmal subarachnoid haemorrhage surgery

min, while in the group of respondents treated surgically for subarachnoid haemorrhage this average was lower, at 72 (68-80)/min. In the respondents treated for an aneurysm there was on average a higher pulse frequency.



Chart 10. The average values of oxygen saturation of the participants after aneurysmal and nonaneurysmal subarachnoid haemorrhage surgery

In respondents treated surgically for an aneurysm the average oxygen saturation was 97 (92-99)%, while in the group of respondents treated surgically for subarachnoid haemorrhage the average saturation was 97 (91-99)%. The average values of oxygen saturation between the two groups of respondents were even, p=0.627 respectively, and there was no significant statistical difference. In both groups of the respondents the saturation values were inside the reference interval of 90-100%.

Of the total sample in the group with aneurysmal subarachnoid haemorrhage, 9 of the respondents (9.7%) acquired ventilator-associated pneumonia and 2 (4.1%) in the group with nonaneurysmal subarachnoid haemorrhage.

There was incidence of nosocomial infections in 16 patients with aneurysmal subarachnoid haemorrhage (17.2%). There was a similar situation in those patients operated on due to nonaneurysmal



Chart 11. Ventilator-associated pneumonia as a complication after aneurysmal and nonaneurysmal subarachnoid haemorrhage surgery



Chart 12. Nosocomial infections as a complication after aneurysmal and nonaneurysmal subarachnoid haemorrhage surgery subarachnoid haemorrhage – 4 (8.2%) of them had nosocomial infections. No statistical difference was noted.

Fatal outcome was observed in a total of 30 (32.6%) patients operated on for an aneurysm, and around one third of the patients -62 (67.4%), survived after the surgery. The number of respondents with a

fatal outcome who underwent surgery for subarachnoid haemorrhage was smaller than in the patients with aneurysmal haemorrhage 4 (8.2%), while there were 45 (91.8%) of the respondents who survived. The number of patients with the fatal outcome was statistically different between the two diseases – χ^2 =11.8 p=0.001.



Chart 13. The number of respondents with a fatal outcome with respect to aneurysmal and nonaneurysmal subarachnoid haemorrhage



Chart 14. The mobility of patients after surgery

Of the total number of patients operated on for an aneurysm, 44 (47.3%) was independently mobile after surgery, 9 (9.7%) had limited mobility, 8 (8.6%) had very limited mobility and 32 (34.4%) were immobile. Most of the respondents operated on for subarachnoid haemorrhage were either independently mobile after the operation – 32 (65.3%), 10 (20.4%) had limited mobility, 3 (6.1%) had very limited mobility and only four (8.2%) were immobile. The mobility of patients after surgery was statistically significant $-\chi^2$ =15.244, *p*=0.002.

There was a fatal outcome for 30 (32.6%) patients operated on for an aneurysm, two thirds of them survived after surgery – 62 (67.4%), 11 respondents had a middle level of physical ability (11.8%), 5 had poor physical ability (5.4%), and only 2 (2.2%) respondents had very low level of physical ability after surgery. More than half of the respondents were in a good physical state after surgery. The physical state of the group treated for nonaneurysmal subarachnoid haemorrhage did not improve in 5 (10.2%) respondents, middle level of physical ability was observed in 9 (18.4%) respondents, and there was only one respondent (2%) who had a poor level of physical ability after surgery. More than half of the respondents were in a good physical state after surgery.

Discussion

Research was conducted at the Department of Neurosurgery, University of Sarajevo Clinical Centre on a sample of 142 patients. The topic of the study was related to the testing of the monitoring in the treatment of surgical patients with aneurysmal and nonaneurysmal subarachnoid haemorrhage in terms of nursing care.

Both genders in the research were evenly represented which is evident in other research of the same nature (32). However, different studies had different prevalence. Schertz and colleagues presented results that showed the increased risk of subarachnoid haemorrhage with female participants, and that the risk increased with age. In the Konczalla and colleagues research there were more male participants in the sample (33).

The results of our study showed that of the 142 respondents, 65.5% were hospitalized for aneurysmal subarachnoid haemorrhage surgery, while only 34.5% were operated on due to nonaneurysmal haemorrhage. Shertz and colleagues showed that during seven years of research the number of subarachnoid haemorrhages was also low (20.7%). Similar results were found in other research that were dealing with the issue of subarachnoid haemorrhage and aneurysm (Flaherty and colleagues) (36).



Chart 15. The physical status of patients after surgery

According to Rooij and colleagues and Schertz and colleagues, women are at a higher risk of subarachnoid haemorrhage and intracranial aneurysms. The results of our research are similar to the abovementioned research, but only for an aneurysm where female participants dominate in the ratio of 65.6% to 34.4%.

However, for the development of subarachnoid haemorrhage, the situation is somewhat different, men are represented in higher numbers than women – 81.6% to 18.4%. These results can be explained by women's greater concern for their health who at the smallest "signal" that suggests a health problem seek to resolve it (35).

According to research by Alg and associates, subarachnoid haemorrhage is more often in women than in men (2:1), with a peak incidence in people between 50 and 60 years of age. In our research subarachnoid haemorrhage was more present in men than in women with the ratio of 81.6% to 18.4%.

In both genders, the average age of subarachnoid haemorrhage morbidity corresponds to other studies, on average 61 years of age (33).

However, there was a significant difference in the category of those with an aneurysm, which in both gender categories were younger – 53 years of age (36). The explanation lies in the potential danger of an unruptured aneurysm that is often discovered by accident in younger population.

The fundamentals of monitoring the patients after the surgery of subarachnoid haemorrhage include the use of the advanced technologies for monitoring the patients with injuries to the brain. Recommended interventions include placing the ventricular catheter, prophylaxis against recurrent bleeding and control of intracranial pressure and optimization of central venous pressure. In a sense there is a need to provide an optimal physiological environment that will help the promotion of normal neuron recovery (37).

Our research was limited in terms of the monitoring the vital parameters via ECG monitor (heart rate, systolic and diastolic pressure, oxygen saturation, temperature, respiration), that is, those parameters that nurses in the intensive care unit are in charge of. The results showed that only 2% of the patients after aneurysm surgery are not on continuous non-invasive monitoring (apparatus for monitoring vital parameters), while the share of patients after subarachnoid haemorrhage surgery was significantly higher at 24.5%.

However, the high rate of monitoring is present in both categories, regardless of the higher percentage of those who had a good postoperative recovery in both categories. These results support the conscientious monitoring of the patient by the medical staff. In the intensive care unit, where there is already a high number of patients in a serious health condition, postoperative monitoring is continuous (38).

In our study, there was a statistical difference between the average hospital stay of the patients with aneurysmal and patients with nonaneurysmal subarachnoid haemorrhage. The respondents with an aneurysm on average stayed 18 days (12-24) in hospital, as opposed to those with nonaneurysmal subarachnoid haemorrhage, where the average stay was 9 days (7-12). The explanation is logical considering that a higher percentage of patients with aneurysmal subarachnoid haemorrhage (34.4%) were immobile after surgery, as opposed to those who suffered from nonaneurysmal subarachnoid haemorrhage (8.2%) and demanded additional treatment. As shown by Frontera and colleagues, the average hospital stay was 8 days (range from 0 to 50) but unlike in our study, the length of stay was increased in relation to infection. All infections that were considered, led to the prolongation of hospitalization (39).

For the assessment of the current state of the volume and the condition of bloodstream, many parameters must be taken into account and interpreted together, taking into consideration the condition of the patient. Therefore, this interpretation remains very hard to do. The average values of systolic and diastolic blood pressure were inside the reference values, 120 mmHg systolic and 70 mmHg diastolic pressure, unified for both categories of respondents of the study – both for those with aneurysmal and those with nonaneurysmal subarachnoid haemorrhage.

The known risk factors for subarachnoid haemorrhage are smoking, hypertension and excessive alcohol intake. Smoking and hypertension are seen to have an addictive effect. A study by Vlak and colleagues did not characterize hypertension as a risk factor for subarachnoid haemorrhage and aneurysm. They noted smoking as one of the possible risk factors. Also, smoking, drinking and hypertension, as factors that can be modified in general population, can be used as a means to reduce this pathology. Unfortunately, our study is retrospective, so we were not in a position to analyze these individual factors (40,41). Although a history of hypertension does not increase the risk of rupture, however, a sharp rise in blood pressure can be the cause of aneurysmal rupture (42).

The results of the studies of Morita and colleagues, as well as Vlak and colleagues, did not find significant connections between hypertension and aneurysm formation and subarachnoid haemorrhage, only that a sudden and short increase in blood pressure causes subarachnoid haemorrhage. In our study, the test sample was normotensive. However, there were limitations to the study because only the monitoring after the surgical treatment was observed, so there is no insight into what kind of etiological factor caused the condition of aneurysm or subarachnoid haemorrhage. However, indicators support a good monitoring of patients considering the blood pressure postoperatively.

Possible explanation for this finding is that hypertension leads to the formation of aneurysm, but the treatment of hypertension reduces further growth of the aneurysm and thus the risk of subarachnoid haemorrhage (43).

According to a study by Konczalla and colleagues, 85% of the patients with nonaneurysmal subarachnoid haemorrhage were in good clinical state. Similar results have been shown by other authors. According to our study, more than half of the patients in both categories - with nonaneurysmal and aneurysmal subarachnoid haemorrhage, were of a good physical status, therefore, the results cannot be compared to other studies. In the other half of the respondents, for 30.1% of them with aneurysmal etiology, the physical state has not improved after surgery, while that percentage is lower in patients with nonaneurysmal subarachnoid haemorrhage - 10.2%. Since patients were treated in only one clinic, and were equally under the control of doctors and nurses, this clinical course can be attributed to the severity, that is, to the aneurysm as a cause of subarachnoid haemorrhage which as such has a more severe clinical course.

The neurological status of the analyzed sample was such that 57% of those with aneurysmal subarachnoid haemorrhage were conscious and communicative. A significantly higher percentage, 75.5% of them, were in the category of nonaneurysmal subarachnoid haemorrhage. Contrary to this good neurological outcome, 31.2% of the respondents with aneurysms were in a coma after surgery, while in the category of nonaneurysmal haemorrhage, only 8.2% of the respondents were in a coma. Konczalla and colleagues had a better neurological outcome in 83% of the patients with nonaneurysmal subarachnoid haemorrhage (45).

Conclusion

- Of the 142 respondents in the sample, 65.5% were hospitalized for aneurysmal subarachnoid haemorrhage surgery, and 34.5% of the patients were operated on for nonaneurysmal subarachnoid haemorrhage. The average age of the respondents was 54 years, there was equal gender structure with a slight predominance of men (57%). Aneurysmal subarachnoid haemorrhage was more frequent among women (65.6%). Respondents with nonaneurysmal subarachnoid haemorrhage were older 61 (43-62) years of age.
- Only 2% of the patients after aneurysmal subarachnoid haemorrhage surgery were monitored, while the number of the monitored patients after nonaneurysmal subarachnoid haemorrhage surgery was significantly higher at 24.5%.
- Fatal outcome was present in a total of 30 (32.6%) patients operated on for aneurysmal subarachnoid haemorrhage, while the percentage of those who were operated on due to nonaneurysmal haemorrhage was lower and amounted to 4 (8.2%). Surviving patients, those with aneurysmal subarachnoid haemorrhage, on average stayed in hospital for 18 (12-24) days.
- The tasks of nurses in the process of nursing care of neurosurgical patients are related to the monitoring of vital parameters, monitoring the status of the skin and development of pressure ulcers, states of consciousness according to the Glasgow coma scale, and initiation of physical therapy.
- The indicators of quality of nursing care (ventilator-associated pneumonia, nosocomial infections, bedsores) between the two categories of patients who were operated on due to aneurysmal and nonaneurysmal subarachnoid haemorrhage, did not show statistical difference.

Based on the results of the research, the arguments were obtained to confirm the working hypothesis of the research that a large number of complications in surgical patients after aneurysmal and nonaneurysmal subarachnoid haemorrhage can be prevented with proper nursing care, monitoring and rehabilitation.

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MONITORING U TRETMANU PACIJENATA S ANEURIZMATSKIM I NEANEURIZMATSKIM SUBARAHNOIDNIM KRVARENJEM S ASPEKTA ZDRAVSTVENE NJEGE I TERAPIJE

Sažetak

Subarahnoidna hemoragija stanje je izlijevanja krvi iz moždanih arterija u subarahnoidni prostor duž površine mozga. Subarahnoidna hemoragija (SAH) ima brojne etiološke mogućnosti, ali kada je riječ o spontanoj subarahnoidnoj hemoragiji, u 80 % slučajeva uzrok joj je ruptura intrakranijske aneurizme. Subarahnoidna hemoragija može biti spontana i traumatska (posttraumatska). Također, može biti primarna ili sekundarna.

Inicijalna procjena bolesnika uključuje: pregled kvantitativnog stanja svijesti, veličinu zjenica i reakciju na svjetlost, motoričku i senzoričku funkciju, prisutnost glavobolje, disfunkciju kranijalnih živaca (ptoza kapaka, poteškoće pomicanja očiju u svim pravcima), zamagljen vid, afaziju, ostale neurološke deficite.

Nekoliko ozbiljnih komplikacija često nastaje nakon uspješne operacije subarahnoidne hemoragije i aneurizme. Jedna je takva komplikacija cerebralni vazospazam, a javlja se u 50 do 70 % pacijenata. Odložene su komplikacije: recidivirajuće krvarenje, edem mozga, kronični hidrocefalus i kao najvažnija – infarkt mozga.

U monitoriranju te ovisno o nastalim komplikacijama, ali i u svim situacijama, uloga medicinske sestre prvenstveno se ogleda u praćenju vitalnih parametara i stanja svijesti te u prepoznavanju trenutaka nastanka klinički relevantne neurodeteriorijacije.

Ciljevi. Prikazati ukupan broj operiranih pacijenata s potvrđenom subarahnoidnom hemoragijom na Klinici za neurohirurgiju Kliničkog centra Univerziteta u Sarajevu u periodu od 1. siječnja 2013. do 31. prosinca 2014. Te prikazati: načine monitoriranja pacijenata od primitka u Kliniku do otpusta, stadije ishoda liječenja i indikatore kvalitete (ventilacijska pneumonija, intrahospitalne infekcije, dekubitusi) kod ispitivanog uzorka.

Metode. Provedena je retrospektivna studija. Učinjena je deskriptivno-analitička komparacija podataka iz povijesti bolesti i temperaturnih lista pacijenata koji su operirani na Klinici za neurohirurgiju Kliničkog centra Univerziteta u Sarajevu. Uzorak su činili pacijenti oba spola s potvrđenom dijagnozom subarahnoidne hemoragije koji su operirani u Klinici u periodu od 1. siječnja 2013. do 31. prosinca 2014. Muškarci su bili zastupljeni s 50,7 % (N = 72), a žene 49,3 % (N = 70). Sudionici u studiji prosječne su dobi 54 godine, odnosno 45 - 63,2 godine.

Rezultati. Od 142 ispitanika u uzorku, 65,5 % ih je hospitalizirano radi operacije aneurizmatskog, a 34,5 % operiranih zbog neaneurizmatske subarahnoidne hemoragije. Ispitanici su prosječne dobi 54 godine. Muškarci su u prosjeku stari 53 godine, a žene 55 godina. Aneurizmatska subarahnoidna hemoragija bila je zastupljenija kod žena (65,6 %). Ispitanici s neaneurizmatskom subarahnoidnom hemoragijom su stariji, u prosjeku u dobi od 61 (od 43 do 62) godine. Samo 2 % ispitanika nakon operacije aneurizme nije bilo na neinvazivnom monitoringu, dok je udio takvih ispitanika nakon operacije neaneurizmatske subarahnoidne hemoragije znatno veći, 24,5 %.

Smrtni ishod bolesti imalo je ukupno 30 (32,6 %) ispitanika operiranih zbog aneurizme, dok je taj postotak kod onih koji su operirani zbog neaneurizmatske bio manji i iznosi 8,2 % (četiri ispitanika). Od preživjelih pacijenata, oni s aneurizmom u prosjeku su duže boravili u bolnici – 18 (12 do 24) dana. Od ukupnog broja operiranih zbog aneurizme 44 (47,3%) je bilo samostalno pokretno nakon operacije, devet (9,7 %) ograničeno pokretno, osmero (8,6%) je imalo vrlo ograničenu pokretljivost i 32 (34,4%) je bilo nepokretno.

Većina ispitanika operiranih nakon SAH-a samostalno je pokretna nakon operacije – 32 (65,3%), 10 (20,4 %) ih je ograničeno pokretnih, troje (6,1 %) je imalo vrlo ograničenu pokretljivost i samo su četiri ispitanika (8,2 %) nepokretna. Od ukupnog uzorka – aneurizmatske subarahnoidne hemoragije ventilacijsku pneumoniju imalo je devet ispitanika (9,7 %) koji su podvrgnuti operaciji aneurizme, a dva (4,1 %) bolesnika nakon operacije SAH-a.

Ključne riječi: subarahnoidna hemoragija, aneurizma, monitoring, neurokirurška sestra, poslijeoperacijska zdravstvena njega,vazospazam, bolničke infekcije i komplikacije

An Assessment of Decision to Change Lifestyle in Cardiovascular Patients after Hospitalization

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Abstract

The aim of this study was to examine the lifestyle of cardiovascular patients with different diagnoses, as

well as the willingness to change lifestyle after hospitalization. These results can significantly influence everyday nursing practice during rehabilitation and education of cardiovascular patients and increase motivation to change risk behavior. The participants of the study were the patients at the Cardiology Department of the Special Hospital for Medical Rehabilitation Krapinske Toplice (N=70). In assessing their lifestyle before the hospitalization most participants agreed with the statements "I was often tense, angry or concerned about the events in the society" and "I was often tense, angry or worried while following the media". Rural participants compared to those from urban areas estimated their lifestyle before hospitalization statistically as more risky. Most participants decided to change their lifestyle compared to the habits they had before hospitalization. They mostly agree with the statements related to the decision of reducing cigarette consumption and walking more. Older participants brought significantly less decisions of changing lifestyle after hospitalization. Furthermore, there were no significant differences in the decision to change lifestyle in terms of gender, work activity and professional occupation. Participants with arrhythmia had a statistically significant higher value of lifestyle change compared to those who had myocardial infarction and hypertension. Participants with bypass had a statistically significant higher value of decision to change lifestyle compared to those who were hospitalized because of arrhythmia. These results are useful for identifying groups of patients where nurses need to make additional efforts to encourage motivation to change risky lifestyle.

Introduction

Chronic non-communicable diseases are responsible for 93% of mortality in Croatia (1). Among them, the leading cause of mortality and stroke are cardiovascular diseases (CVD). In 2017, 23 504 people died of the latter which makes 44% of total deaths. Ischemic heart disease has the largest share in total mortality with 20.7% (11069) and cerebrovascular disease with 11.5% (6147) (2). It is the same case with the leading causes of mortality on an average global level (3), although since recently in some Western European countries the leading cause of mortality have been malignant diseases (4). Since the mid-20th century, there has been an undeniable correlation of the risk of illness from non-communicabe chronic diseases and lifestyle, or characteristics of health behavior. Since then, there is a great interest in identifying the factors which determine one's health behavior. The aim is to find out which factors can affect the learning of protective health behavior and the prevention, postponement or alteration of risky health behaviors. Nowadays, it has been found that the interdependence and correlation of the factors of health behavior is guite complex (5). Therefore, a number of theories or patterns of health behavior have emerged, which differ in terms of what psychosocial factors are considered to be key in achieving the desired behavior. But there is a common assumption that human behavior is essentially rational and deliberate, and that people decide to change or adopt new behaviors after making a decision on a complex process (6). Making the decision to change is the first step towards a real change in behavior and all the knowledge about the factors that influence decision-making are significant to the work of health professionals, especially nurses during the rehabilitation of cardiovascular patients.

Lifestyle, as a manifestation of a series of individual behaviors, partially depends on internal, psychological factors, or serves as a form of self-expression of values and attitudes of an individual (3). On the other hand, it is influenced by external geographic, demographic, economic and social factors. The social environment acts as a model and measure for comparing and evaluating one's own behavior and makes different lifestyles available to the individual. Risk factors can be divided into: risk factors that cannot be influenced ("invariable risk factors") which include age, gender, genetic inheritance, race and risk factors, and those which can be affected ("variable risk factors") such as stress, depression, smoking, inadequate physical activity, obesity, alcohol, unhealthy diet. In the Maćešić and Špehar research (2013), cardiovascular risk of 150 patients over the age of 40 was estimated at the general practitioner's. The results show that general practitioners are mostly visited by patients aged from 60 to 69 years old. There are more women aged between 50 and 59 which is related to menopause (7). 43% of patients are overweight, 35% are obese. The highest number of women and men have normal blood pressure as a result of regular therapy (71%). 16% of participants have regular exercise, 21% of respondents consume alcohol, and a small percentage of respondents smoke (7). Patients were much more receptive to taking regular therapy than to the need for a change in lifestyle, in this case physical activity and nutrition.

According to studies in different populations, the most significant (44-76%) prevention and risk behavioral change is associated with the reduction of mortality from cardiovascular disease, and 23-47% reduction is attributed to therapeutic interventions (8). In favour of these studies are also the results of multi-year preventive activities in Western Europe and North America where there is a reduction in the incidence of cardiovascular disease.

Preventive activities include primary and secondary prevention, population and individual approach. Primary prevention focuses on lifestyle education (non-smoking, physical activity, proper nutrition) and avoidance of risk. It starts from the earliest age, in kindergarten and school where children are taught about health and healthy lifestyles. Secondary prevention is aimed at preventing the deterioration of the disease, the occurrence of complications in rehabilitation, reduction of disability and the preservation of life quality in patients which have already developed an illness. Population approach interventions are directed towards the population with low or medium risk and individual access to high risk individuals. Both approaches are commonly implemented. Population approaches to prevention include changing lifestyle change, social and economic determinants, and they must be an integral part of public policy and involve other sectors of society (9). Prevention plays an important, crucial role and is a problem that needs to be systematically addressed by health policy, with

the emphasis on strengthening individual's personal responsibility in the field of lifestyle choices (10). The promotion of healthy lifestyles has to be spread locally as much as possible, providing common availability of the abovementioned activities.

An example of good practice is the healthcare reform in the Netherlands. It started by the adoption of the National Preventive Plan in 2014, which advocates promoting health and disease prevention in the areas where people live, work, and learn. Prevention is given an important role in the health care of cardiovascular diseases and cardiovascular disease has fallen to the second place as the cause of mortality, behind malignant diseases (4).

According to our findings, a clinical study studying the lifestyle of cardiovascular patients before hospitalization, as well as the decisions of changing lifestyle or different health behaviors after hospitalization has not been conducted in Croatia. Such research could be of great importance to nurses and other health workers during the rehabilitation and education of cardiovascular patients.

Therefore, the aim of our research regarding hospitalized patients with cardiovascular diseases was to:

- 1. Identify common health behavior
- 2. Determine the decision-degree of changing health behavior after hospitalization
- to examine the differences in health behavior before hospitalization and decisions to change health behavior after hospitalization due to the reason of hospitalization, age, sex and the environment in which patients live.

The underlying hypothesis is that there are different lifestyles and different degrees of willingness to change behavior after hospitalization among the patients with different diagnosis and different sociodemographic characteristics. (54.3%) men and 32 (45.7%) women. The age range was from 31 to 83 years, with an average value of 61.37 (SD = 12.209). Most participants (41.4%) had completed secondary school, 22.9% had a bachelor degree, 20.0% finished primary school and 15.7% participants had a master's degree. Most participants (64.3%) didn't work. Most of the participants (47.1%) lived in a city, 30% in a village and 22.9% in a suburban area. The most common cause of hospitalization was myocardial infarction (Table 1).

Table 1. Reasons for participants' hospitalization							
Reason for hospitalization	Ν	%					
Angina pectoris	12	17.1					
Arrhythmia	4	5.7					
Hypertension	12	17.1					
Myocardial infarction	35	50					
Bypass	7	10					
	70	100					

Materials and procedure

The research was conducted in July 2017 with a questionnaire compiled for this purpose. The questionnaire contained socio-demographic data, the reason for hospitalization, 17 statements about lifestyle before hospitalization and 17 statements related to the decision of changing lifestyle after hospitalization. With each statement, the participants chose one of the answers: (1) completely disagree, (2) partially agree or (3) fully agree. The overall score for assessing lifestyle before hospitalization as well as the overall outcome of the decision to change lifestyle after hospitalization was obtained by summing up the estimates on individual claims. 80 questionnaires were distributed and 70 which were properly filled out were statistically analyzed. The research was voluntary, anonymous and approved by the Ethical Committee of the Special Hospital for Medical Rehabilitation Krapinske Toplice. Data were analyzed using SPSS 17.0.

Methods

The participants in the study were patients (N=70) at the Cardiology Department of the Special Hospital for Medical Rehabilitation Krapinske Toplice, 38

Results

In the analysis of lifestyle prior to hospitalization, the highest average response was: "I was often tense, angry or concerned due to social events" (M=2.06) and "I was often tense, angry or worried while following the media "(M=2.06). The lowest average response was: "Daily consumed more alcoholic beverages" (M=1.47) and "Daily consumed more than one packet of cigarettes " (M=1.50) (Table 2).

Table 2. Descriptive indicators for lifestyle assessment before hospi	claims talizat	for tion
Before hospitalization I:	Μ	SD
was often tense, angry or worried due to social events	2.06	0.72
was often tense, angry or worried while following the media	2.06	0.74
didn't regularly control my health condition	2.01	0.75
was often stressed because of financial problems	2.00	0.80
rarely or never walked	1.93	0.69
didn't indulge in any physical activity	1.89	0.67
didn't regularly take prescribed medicine	1.81	0.71
ate a lot of processed meat	1.73	0.66
was often under pressure due to work situation	1.73	0.70
ate a lot of salty food	1.70	0.66
had irregular meals	1.69	0.79
ate mostly fatty food	1.67	0.70
consumed a lot of candy	1.60	0.71
daily consumed one packet of cigarette	1.60	0.81
daily consumed sparkling and sweetened beverages	1.54	0.70
daily consumed more than one packet of cigarette	1.50	0.74
daily consumed more alcoholic beverages	1.47	0.68
Legend: M - arithmetic mean, SD - standard deviation		

In the analysis of the responses about the decision to change lifestyle after hospitalization, the most common response was "I decided to reduce cigarette consumption" (M=2.66) and "I decided to walk more often" (M=2.64). The lowest response rate

was achieved with the statement "I decided to have regular meals" (M=2.40) and "I decided not to stress about the social events" (M=2.44).

Table 3. Descriptive indicators for	assessment
of changes in lifestyle after hos	pitalization

After hospitalization I decided:	Μ	SD
to reduce the consumption of cigarettes	2.66	0.54
to walk more often	2.64	0.48
not to consume cigarettes	2.61	0.55
not to consume alcohol	2.61	0.49
to regularly took prescribed medicine	2.60	0.49
not to stress about work situation	2.59	0.50
not to eat fatty food	2.59	0.52
to reduce salt in food	2.59	0.52
to reduce consumption of candies	2.56	0.50
to do more physical activity	2.51	0.58
to regularly control health condition	2.51	0.61
not to consume sparkling and sweetened beverages	2.49	0.56
not to stress about the media content	2.47	0.63
not to eat processed meat	2.47	0.58
not to stress about financial situation	2.46	0.61
not to stress about social events	2.44	0.61
to have regular meals	2.40	0.62

Legend: M – arithmetic mean, SD – standard deviation

In order to determine the differences in the assessment of the lifestyle prior to the decision of changing lifestyle after hospitalization according to the sociodemographic characteristics of participants, we used nonparametric procedures because all distributions of results deviate from normal.

There are no statistically significant differences in the lifestyle assessment before and decision to change the lifestyle after hospitalization due to the gender and work activity of participants.

There is a statistically significant correlation between the age of the participants and the decision level of change in the lifestyle after hospitalization (r=-0.340, p<0.01). Older participants make significantly less decisions about lifestyle changes after hospitalization due to cardiovascular disorders.

Due to qualifications of the participants, there are no statistically significant differences in the estima-

Table 4. Comparison of lifestyle and decision about changing lifestyle considering gender and work activity									
	Gender	Ν	Mann-Whitney U	р	Work activity	Ν	Mann-Whitney U	р	
Assessment of	Male	38			yes	25			
hospitalization	Female	32	542.500	.438	no	45	491.00	0.379	
Decision about lifestyle after	Male	38			yes	25			
hospitalization	Female	32	465.00	.091	no	45	505.00	0.480	

Table 5. The relation of age and lifestyle before and decision to change lifestyle after hospitalization						
		Age	Lifestyle before hospitalization	Decision to change after hospitalization		
Age	R	1	.040	340**		
	P		.740	.004		
Lifestyle before hospitalization	R	.040	1	203		
	P			.092		
Decision to change after hospitalization	R		203	1		
	р	340**	.092			

Table 6. Comparison of lifestyle and decision about changing lifestyle considering qualifications							
	Qualifications				Н	р	
	Ν	Ν	Ν	Ν			
	Elementary education	Secondary education	Two-year degree	University education			
Lifestyle before hospitalization	14	29	16	11	6.186	0.103	
Decision to change after hospitalization	13	29	16	11	2.838	0.417	

Table 7. Comparison of lifestyle and decision about changing lifestyle considering place of residence (Kruskal Wallis test)							
	Ν	Ν	Ν	Н	р		
	Village	City	Suburban area				
Lifestyle before hospitalization	21	33	16	6.842	0.033		
Decision to change after hospitalization	21	33	16	2.520	0.284		

tion of lifestyle before (Kruskal Wallis H=6.186, df=3, p>0.05) and the decision to change the lifestyle after hospitalization (Kruskal Wallis H=2.838, df =3, p>0.05).

There is a statistically significant difference in the overall estimation of lifestyle before hospitalization regarding the environment in which the participants live (Kruskal Wallis H=6.842, p=0.033). Rank Sum Tests were conducted in order to compare the groups and to determine between which groups and in which direction there was a difference.

Participants from the countryside compared to urban population estimate their lifestyle as more risky (Mann-Whitney U=198.5, p<0.01).

Table 8. Comparison of lifestyle and decision about changing lifestyle considering place of						
residence (Rank Sum Test)						
	Rank Sum Test	Mann-Whitney U	P			
Village	725.5					
City	759.5	198.5	0.008			
Village	440.00					
Suburban area	263.00	127.00	2.07			
City	781.5					
Suburban area	443.5	220.5	0.351			

Table 9. Comparison of lifestyle and decision of changing lifestyle based on the reason for

nospitalization – Kruskai Wallis							
Ν	Ν	Ν	Ν	Ν	Н	р	
Angina pectoris	Arrhythmia	Hypertension	Myocardial infarction	Bypass			
12	4	12	35	7	3.302	0.509	
12	4	12	35	7	10.816	0.029	
	N Angina pectoris 12 12	NNAngina pectorisArrhythmia124124	NNAngina pectorisArrhythmiaHypertension1241212412	NNAngina pectorisArrhythmiaHypertensionMyocardial infarction12412351241235	NOSPITALIZATION - KRUSKAI WAIIISNNNAngina pectorisArrhythmiaHypertensionMyocardial infarctionBypass1241235712412357	N N N N H Angina pectoris Arrhythmia Hypertension Myocardial infarction Bypass 12 4 12 35 7 3.302 12 4 12 35 7 10.816	

There is a statistically significant difference in the decision-making rate of lifestyle after hospitalization due to the reasons of hospitalization of the respondent (Kruskal Wallis H=10.816, p<0.05). Rank Sum Tests were conducted to compare the differences among groups.

In three cases, differences were statistically significant. Respondents hospitalized for arrhythmia (sum of ranks=126.5) compared with those with myocardial infarction (sum of ranks=653.50) have a statistically significant higher degree of the decision to change (Mann Whitney U=23.5, p=0.031). Respondents hospitalized for arrhythmia (sum of ranks=54.50) had a statistically significant higher degree of change in lifestyles (Mann Whitney U=3.5, p=0.013) compared with hypertensive subjects (sum of ranks=81.50). Respondents hospitalized for bypass (sum of ranks=28.00) compared to those hospitalized for arrhythmia (sum of ranks=38.00) had a statistically significant higher level of decision on lifestyle (Mann Whitney U=0.00, p=0.008).

Discussion

There are numerous scientific evidence on the impact of lifestyle (eating habits, cigarettes and alcohol consumption, physical activity level, regular medical examinations, etc.) on health. For people with a dominant negative health behavior, among other things, the risk of cardiovascular disorders and illnesses is much higher. Therefore, in this study, we were interested in evaluating the lifestyle of patients with already confirmed cardiovascular disorders who were hospitalized at the rehabilitation department for cardiac patients.

In assessing the lifestyle before hospitalization, the highest degree of agreement occured with the statements "I was often tense, angry or worried about the events in society" and "I was often tense, angry or worried while following the media". These findings can be seen in the context of numerous studies in which psychosocial risk factors for cardiovascular disease development have shown that people who tend to experience negative affective states and poor mood are generally prone to develop cardiovascular disease (8,9,11,12). Negative emotions act as stressors. Exposure to stressors triggers epinephrine, norepinephrine and other stress hormones, accelerated heartbeat and significant changes in the blood pressure (13). Repeated stressors constantly stimulate cardiac activity. It comes to the straining and tiredness of the cardiovascular system - this leads to permanent constriction of small peripheral arteries which results in elevated blood pressure. Thus, elevated blood pressure acts on the coronary artery, and in the presence of other risk factors the probability of heart attack increases.

The tendency towards negative emotional experience increases the risk of developing depression. Depression is a psychological factor that mostly affects the recovery of patients with survived myocardial infarction and other cardiovascular diseases. It is estimated that more than 30% of patients after myocardial infarction have a clinical picture of depression (14). Depression is a predictor of the risk of re-coronary incidence and total mortality of cardiovascular patients. Depression is more pronounced in older patients with myocardial infarction (13). Findings on the impact of certain characteristics and dependence of patients' emotional experience on probability of cardiovascular incidents emphasize the importance of biopsychosocial access to the patient and the assessment and appreciation of individual differences as factors can contribute to the development and course of the disease itself. The role of nurses who actively participate in the rehabilitation of patients after cardiovascular incident and prevention is of paramount importance.

As part of the second problem, our research has examined the willingness of patients to change their negative health behavior and the degree of change in decision after hospitalization. Assessment of the decision, or showing intention of change, is a significant factor in numerous research (10, 15-18).

In assessing the willingness to change their lifestyle, most patients have decided and are ready to change their lifestyle or health behaviors with regard to what they had before the hospitalization. All the average values reffering to estimation decisions of change are in between (2) "I partially agree", and (3) "I fully agree" (Table 3).

The highest average response was obtained for the following statements "reduce cigarette consumption" and "walk more", suggesting that there is significant awareness of cigarette consumption and inadequate physical activity and most individuals are ready for change. Smoking promotes and initiates the process of atherosclerosis during which plagues (the accumulation of fat, binder and calcium) occur in the blood vessels. Such narrowing of the blood vessels creates inadequate blood flow to the individual parts of the heart and brain, and may also end with death due to stroke or heart attack. Smoking increases the level of fibrin (blood coagulation factor) that is "absorbed" by plagues and thus further narrows blood vessels, causes increased blood pressure, increased oxvgen consumption, minute volume increase, increased platelet aggregation, increased glucose in blood, cortisol, vasopressin and beta endorphin (19). The most common consequence of smoking that occurs in the bloodstream is coronary heart disease. Smoking leads to a drop in the flow through the coronary artery which, with the change of resistance, leads to myocardial ischemia.

The risk of developing cardiovascular and other chronic diseases increases with the number of smoked cigarettes, smoking age, smoking habits and the degree of smoke inhalation. A particular problem is tobacco smoking as a cause of premature mortality in younger population, which implies the loss of potentially active years of life. Permanent smokers are twice as likely to develop cardiovascular disease (one half of the smokers die of cardiovascular disease), and their risk of sudden death is three times greater (20). The risk of cardiovascular disease decreases with smokers who abstain from smoking for only one year. In 500000 people who die annually in the United States from cardiovascular disease, about 21% of deaths are directly related to smoking (20). Patients who get over myocardial infarction and who continue smoking have higher heart failure mortality than non-smokers, and sudden cardiac death is two to three times more common.

The high degree of adherence to a decision to walk more shows an awareness of the importance of physical activity after hospitalization. Inactive persons are twice as more susceptible to cardiovascular diseases than people involved in some physical activity (21). Only 7.6% of the population takes part in a physical activity to a degree that is sufficient to maintain their heart, circulation and lungs in good condition (3).

Regular physical activity is an immediate and independent protective factor for cardiovascular diseases, it reduces the risk of illness. Even the slightest changes in lifestyle with moderate physical activity in middle age reduce mortality from cardiovascular disease. People who had acute myocardial infarction, and then included in the exercise program, have a reduced mortality rate of 20-25% (22). Physical activity has a protective effect because it prevents excess weight, reduces blood pressure, improves lipoprotein status, decreases triglyceride levels and LDL cholesterol, raises the condition (15). The most recommended activities are walking, hiking, swimming and jogging.

As part of the third problem, we examined the differences in lifestyle before and after the decision to change lifestyle after hospitalization with regards to the socio-demographic characteristics of the participants (age, gender, qualification, work activity, the environment in which they live) and the reason for hospitalization. For the lifestyle prior to hospitalization, a statistically significant difference was obtained only in the area where the participants live. The highest average response was for those who lived in the countryside, respectively in the area with poor living habits before hospitalization. These results are consistent with other studies of cardiovascular disease. According to a survey of the Public Health Institute of Varaždin (22), the general mortality rate is higher in rural areas, and the main cause of death is circulatory disease (most commonly heart attack and stroke). Although nutrient-rich food is more common in rural areas, cleaner environment and lifestyle which provides more physical activity, social, cultural, sports-recreational and other amenities that affect the quality of life and individual health are more accessible in the city. Also, health care is of higher quality, especially emergency medical aid, and specialized counseling and health care are more accessible. In rural areas, there is in general worse preventative activities coverage, poor health prosperity, and greater mortality from different illnesses. Health awareness information is gained from people who had been treated for their disease prior to their death. The number of such people is up to 5 % lower in rural areas than in the city, which means that a greater number of diseases remain undetected (22). Differences in the higher level of risk factors for cardiovascular disease in rural areas compared to urban environments are also gained in other social enviroments and are recognized as a global trend (23, 24). The age of respondents is significantly correlated with the degree of decision about changing lifestyle after hospitalization. Older respondents make significantly less decisions of lifestyle changes after hospitalization due to cardiovascular disorders, as in other similar studies (25, 26, 27).

In assessing the decision on changing lifestyles after hospitalization, there was a significant difference in the reason for hospitalization of cardiovascular patients. The decision to change is most expressed in patients with arrhythmias and angina pectoris. We can assume that this is the result of patients thinking it is a serious and potentially life-threatening condition. In accordance with the latter mentioned, further research is needed.

This results are important because of a significant role of nurses in health promotion and rehabilitation of cardiac patients. Cardiac rehabilitation leads to improvements in overall results after acute treatment through patient training by constant repetition and emphasizing the importance of regular control and healthy living habits, thus it reduces the number of recurrent hospitalizations and treatment costs (26). Our research has shown that patients are most willing to change the habits associated with smoking and physical activity, therefore nurses' role is to additionally emphasize the importance of other changes related to nutrition, alcohol consumption, regular therapy, and so on. According to the World Health Organization, three-quarters of all deaths caused by cardiovascular disease can be prevented by changing poor living habits. Successfully implemented preventive, diagnostic, therapeutic and rehabilitative measures bring a significant increase in survival and improve the quality of life, reducing the overall social and economic burden. The effectiveness of these measures is most influenced by the motivation that nurses can encourage during the nursing care of a cardiovascular patient. By promoting health, they can transfer knowledge about the importance of health, but also influence motivation for change and maintenance. Health promotion has evolved in response to increased motivation to take control of one's own life and health, limited results of "traditional" health measures and interventions, and in response to the fact that many health problems such as cardiovascular disease appear due to lifestyle and the habit of an individual (28). In the following research it would be good to examine the lifestyle of the patients even after the hospitalization itself and to determine the extent to which the decision to change the lifestyle has really affected the health behavior of cardiac patients after hospitalization.

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Conclusion

Patients hospitalized at the Cardiology Department of the Special Hospital for Medical Rehabilitation Krapinske Toplice in lifestyle assessment mostly agree with the statements that before hospitalization they were often tense, angry or worried about the events in the society and the media. Rural participants compared to those from suburban and urban areas, had the most risky lifestyle before hospitalization. Most patients decided to change their lifestyle after hospitalization. The highest degree of decision is related to smoking reduction and initiation of regular physical activity in form of walking more.

Older participants make significantly less decisions about changing their lifestyle after hospitalization. Also, there are no significant differences in the decision of changing lifestyle in terms of gender, work activity and professional occupation. Participants with arrhythmia have a statistically significant higher degree of change compared to those who have myocardial infarction and hypertension. Participants with bypass have statistically significant higher levels of decision about lifestyle changes compared to those who were hospitalized because of arrhythmia. The results are considered to be a significant contributor to the health care of cardiology patients based on evidence.

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PROCJENA ODLUKE O PROMJENI ŽIVOTNOG STILA NAKON HOSPITALIZACIJE KOD KARDIOVASKULARNIH BOLESNIKA

Sažetak

Svrha istraživanja bila je ispitati životni stil prije hospitalizacije kod kardiovaskularnih pacijenata različitih dijagnoza, kao i spremnost na promjenu životnog stila nakon hospitalizacije. Ti podaci mogu znatno utjecati na rad medicinskih sestara tijekom rehabilitacije i edukacije kardiovaskularnih pacijenata te poticanja motivacije na promjenu rizičnih ponašanja.

Sudionici istraživanja bili su pacijenti kardiološkog odjela Specijalne bolnice za medicinsku rehabilitaciju Krapinske Toplice (N = 70). U procjeni životnog stila prije hospitalizacije najviše se slažu s tvrdnjama često sam bio/la napet/a, ljut/a ili zabrinut/a zbog događaja u društvu te često sam bio/la napet/a, ljut/a ili zabrinut/a dok pratim medije. Sudionici sa sela u usporedbi sa sudionicima iz gradskih naselja procjenjuju svoj životni stil prije hospitalizacije statistički značajno riskantnijim. Većina pacijenata odlučila je promijeniti životne navike u odnosu na one koje su imali prije hospitalizacije. Najviše se slažu s tvrdnjama koje se odnose na odluku o smanjenom konzumiranju cigareta i više pješačenja. Stariji ispitanici donose značajnp manje odluka o promjeni životnoga stila nakon hospitalizacije, a nema značajnih razlika u odluci o promjeni životnog stila s obzirom na spol, radnu aktivnost i stručnu spremu sudionika. Ispitanici hospitalizirani zbog aritmije imaju statistički značajno viši stupanj odluke o promjeni u usporedbi s ispitanicima s infarktom miokarda i s hipertenzijom. Ispitanici hospitalizirani zbog ugradnje premosnica imaju statistički značajno viši stupanj odluke o promjeni životnog stila u usporedbi s ispitanicima hospitaliziranima zbog aritmije. Dobiveni podaci korisni su za prepoznavanje skupina pacijenata kod kojih medicinske sestre moraju uložiti dodatne napore u stvaranju motivacije za promjenu rizičnoga životnog stila.

Ključne riječi: životni stil, kardiovaskularne bolesti, odluka o promjeni, prevencija

Nurse Perception of Nursing Handover at the University Clinical Hospital in Zagreb

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Keywords: nursing handover, patient safety, nursing handover guidelines, safety meeting, handover list

Abstract

Introduction. Nursing handover refers to communication occurring between two shifts of nurses with the specific purpose of handing over information about patients under the nurses' care. Several styles of nursing handover exist, whereas in Croatia written handover is legally required. **Aim.** The aim of the study was to examine nurses' perception of the nursing handover: whether nursing handover improves patient safety, whether the content of the handover influences the quality of nursing care and whether the handover is important for continuity of nursing care. The aim was also to determine how the nursing handover is performed, how long it takes and whether written instructions are necessary for the nursing handover.

Methods. The study was conducted between 1 October 2017 and 30 October 2017. The study was conducted on the basis of a questionnaire made specifically for this purpose. The questionnaire consisted of 14 questions. The first part of the questionnaire referred to the participants' demographic data: years of service, age, gender, education level, workplace; the second part of the questionnaire referred to nurses' perception of the nursing handover.

Results. The questionnaire was filled in by 295 nurses. Out of this number, 40 were male and 255 female nurses. The majority of participants finished secondary education and have been working between 11 and 20 years. In most cases, nursing handover is recorded in electronic written form and also at the patient's bedside. Over 90% of participants feel that the handover contributes to improved patient safety and quality of care.

Conclusion. Nursing handover is recorded in electronic written form, as well as at the patient's bedside on all wards that participated in the study. This form of handover ensures better continuity of care, improves patient safety and reduces loss of vital information. The need to draw up written instructions for the nursing handover was determined.

Introduction

Nursing handover refers to communication occurring between two shifts of nurses with the specific purpose of handing over information about patients under the nurses' care (1). Literature cites several different styles of handover: oral, recorded, handover at the patient's bedside and written handover. Each of the above-mentioned handover styles has its advantages and disadvantages. Often individual handover styles are combined. Current research of handover styles is not sufficient to answer the question which handover style is the best. Additional research is needed to determine which handover style to use (2).

In Croatia written nursing handover is used. This way of nursing handover is required by the Law on Nursing (3). Additionally, in all hospitals nursing documentation is kept in electronic form, and so the nursing handover is also written in electronic form. But on most wards, handover at the bedside is also used along with written handover. Thus, the patient is involved in his own care, he gets information about his condition, knows who provides his care and what is planned. Patient satisfaction is greater when handover at the patient's bedside is used (4,5).

The WHO Center for Patient Safety recommends the use of a standardized approach in communication during nursing handover, as well as the use of tools such as the SBAR tool (6).

In literature a strong emphasis is placed on the safety meeting before each handover. The safety meeting is led by the team leader, its purpose being to warn about issues during previous shifts. Issues can include two patients with the same last name, a new form of patient registration, problems with the electronic environment (7).

Some authors emphasize the importance of the handover list. In their opinion, the handover list combined with bedside handover can completely eliminate any loss of information during handover (8).

Aims:

- 1. To determine, how nurses record the nursing handover
- 2. To determine how long the nursing handover lasts
- To compare the observed variables with regard to different clinics, nurses' work experience and education level
- 4. To examine nurses' perception of whether nursing handover improves patient safety, whether the content of the handover influences the quality of nursing care and whether the handover is important for continuity of nursing care
- 5. To determine whether a safety meeting was held before each handover
- 6. To find out whether nurses feel that a written set of instructions for the nursing handover should exist.

Methods

Respondents were nurses working in shifts in the UHC Zagreb at the following clinics: the Clinic for respiratory diseases Jordanovac, Clinic for thoracic surgery Jordanovac, Clinic for surgery, Clinic for internal diseases, Clinic for psychological medicine, Clinic for neurology, Clinic for oncology, Clinic for otorhinolaryngology and maxillofacial surgery and the Clinic for anesthesiology, reanimation and intensive care. The questionnaire was filled in by 295 nurses. Out of this number, 40 were male and 255 female nurses.

The study was conducted between 1 October 2017 and 30 October 2017. The study was conducted on the basis of a questionnaire made specifically for this purpose. The questionnaire consisted of 14 questions: the first part of the questionnaire related to demographic questions: years of service, age, gender, level of education, place of work; the second part of the questionnaire referred to the nursing handover itself: the way the handover is recorded, how long it lasts, how it affects patient safety, quality and continuity of care, whether a security meeting has been held, whether confidential information is mentioned during handover, if there should be written instructions for the handover. Questions were closed-ended with provided answers.

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Results

The questionnaire was filled in by 295 respondents, of whom 40 (13.6%) were male and 255 (86.4%) were female. The age range shows that most respondents were between the ages of 20 and 40. As for the years of service, the highest number of respondents had between 11 and 20 years of work experience (85 respondents/28.8%), followed by respondents with less than 5 years of work experience (81 respondents/27.5%). The distribution with regard to education shows that 174 respondents were nurses with secondary school education (59%), 106 respondents had a bachelor of nursing degree (35.9%), and 15 respondents had a master of nursing degree (5.1%). The data is shown in Table 1.

Table 1. Respondents	demograpi	nic data
Gender	Frequency	Percentage
Male	40	13.6
Female	255	86.4
Total	295	100
Age		
Less than 20 years	6	2
20 - 30 years	108	36.6
31 - 40 years	100	33.9
41 - 50 years	45	15.3
51 - 60 years	36	12.2
Total	295	100
Years of service		
Less than 5 years	81	27.5
5 - 10 years	46	15.6
11 - 20 years	85	28.8
21 - 30 years	51	17.3
More than 30 years	32	10.8
Total	295	100
Level of education		
Secondary school education	174	59
Bachelor of nursing	106	35.9
Master of nursing/graduate nurse	15	5.1
Total	295	100

Nurses from nine clinics at the UHC Zagreb took part in the study, as shown in Table 2. It is evident that the majority of respondents were nurses from the Clinic for respiratory diseases Jordanovac - 62 respondents/21%.

Table 2. Respondent s	s according	to clinic
	Frequency	Percentage
Clinic for otorhinolaryngology and maxillofacial surgery	28	9.5
Clinic for anesthesiology, reanimation and intensive care	45	15.3
Clinic for respiratory diseases Jordanovac	62	21
Clinic for thoracic surgery Jordanovac	28	9.5
Clinic for psychological medicine	10	3.4
Clinic for surgery	31	10.5
Clinic for neurology	22	7.5
Clinic for internal diseases	39	13.2
Clinic for oncology	30	10.2
Total	295	100

One of the questions pivotal to the author was the information about the way that the nursing handover is recorded. Most respondents, 173 in number (58.6%), answered that the nursing handover is recorded in electronic form in the hospital information system, while the handover is done at the patient's bedside. 73 respondents (31.1%) answered that, along with written handover, oral handover in the nurses' room is also done. Other respondents, 96 in number (32.6%), record the nursing handover in written form in the information system or a paper notebook. The data is shown in Table 3.

When asked about how long the nursing handover lasts, the largest number of respondents, 132 in number (44.7%), responded 10 to 15 minutes, while 118 (40%) respondents responded more than 15 minutes. The data is shown in Table 4.

Questions related to the nurses' perception of nursing handover show that a large percentage of nurses - over 90% - believe that nursing handover contributes to improved patient safety, improved quality of care, and better continuity of care.

Table 3. How is the nursing handover recorded? (Multiple answers are possible)

	Frequency	Percentage
Written record in the hospital information system	45	15.3
Written record in a paper notebook	10	3.4
Written record in the hospital information system and a paper notebook	41	13.9
Written record in the hospital information system and oral handover in the nurses' room	73	31.1
Written record in the hospital information system and oral handover at the bedside	173	58.6

Table 4. How long does the nursing handover last?					
	Frequency	Percentage			
Less than 5 minutes	2	0.7			
5 - 10 minutes	43	14.6			
10 - 15 minutes	132	44.7			
More than 15 minutes	118	40			
Total	295	100			

As for the question of involvement of the patient in the nursing handover, most respondents, 144 in number (48.8%), feel that this depends on the condition of the patient, while 106 (35.9%) respondents believe that the patient should not be involved in the nursing handover.

When asked about the safety meeting, the majority (112 in number or 38%) responded that they did not know what a safety meeting was, 101 (34.2%) respondents responded that they conduct a safety meeting, and 82 (27.8%) respondents said that they do not conduct a safety meeting.

205 (69.5%) respondents answered yes when asked whether there should be written instructions for the nursing handover. All the results are shown in Table 5.

Table 5. Results of the nursing h	andover	eption of
	Frequency	Percentage
Do you feel that the handov patient s	er contributes afety?	to improved
Yes	285	96.6
No	З	1
l don't know	7	2.4
Do you feel that the content the quality of r	of the handov nursing care?	ver influences
Yes	275	93.2
No	20	6.8
Do you feel that the patient nursing ha	: should be inv andover?	volved in the
Yes	45	15.3
No	106	35.9
Depends on the condition of the patient	144	48.8
ls confidential information mentioned during	about the par g the handove	tient being r?
Yes	59	20
No	144	48.8
Sometimes	92	31.2
Was a safety meeting held be	fore the nursi	ng handover?
Yes	101	34.2
No	82	27.8
I don't know what a safety meeting is	112	38
Do you feel that a written s nursing handove	set of instruct r should exist	ions for the ?
Yes	205	69.5
No	90	30.5
Do you feel that the nursing continuity of r	handover is in nursing care?	mportant for
Yes	293	99.3
No	2	0.7

There is a statistically significant difference between clinics in relation to whether the patient should be involved in the handover. It is evident that at the Clinic for anesthesiology, reanimation and intensive care nurses are least likely to feel that the patient should be involved in the handover. The majority agrees that this should depend on the patient, most of them being nurses from the Clinic for neurology. The results are shown in Table 6.

The Chi-square test result is significant (χ^2 =48.36; p=0.00).

Table 6. Attitudes at different clinics with regard to patient involvement in the handover				
	Do you feel that the patient should be involved in the handover?			
	Yes (%)	No (%)	Depends on the condition of the patient (%)	Total
Clinic for otorhinolaryngology	8 (28.6)	10 (35.7)	10 (35.7)	28
Clinic for anesthesiology, reanimation and intensive care	2 (4.4)	18 (40)	25 (55.6)	45
Clinic for respiratory diseases	10 (16.1)	23 (37.1)	29 (46.8)	62
Clinic for thoracic surgery	1 (3.6)	14 (50)	13 (46.4)	28
Clinic for psychological medicine	0 (0)	10 (100)	0 (0)	10
Clinic for surgery	10 (32.3)	10 (32.3)	11 (35.5)	31
Clinic for neurology	4 (18.2)	3 (13.6)	15 (68.2)	22
Clinic for internal diseases	6 (15.4)	13 (33.3)	20 (51.3)	39
Clinic for oncology	4 (13.3)	5 (16.7)	21 (51.3)	30
Total	45	106	144	295

Table 7. Is the mention of confidential information different with regard to the clinic?

	Is confidential information about the patient mentioned during handover?			Total
	Yes (%)	No (%)	Sometimes (%)	
Clinic for otorhinolaryngology	10 (35.7)	11 (39.3)	7 (25)	28
Clinic for anesthesiology, reanimation and intensive care	10 (22.2)	15 (33.3)	20 (44.4)	45
Clinic for respiratory diseases	11 (17.7)	31 (50)	20 (32.3)	62
Clinic for thoracic surgery	10 (35.7)	13 (46.4)	5 (17.9)	28
Clinic for psychological medicine	5 (50)	0	5 (50)	10
Clinic for surgery	0	24 (77.4)	7 (22.6)	31
Clinic for neurology	0	12 (54.5)	10 (45.5)	22
Clinic for internal diseases	13 (33.3)	10 (25.6)	16 (41)	39
Clinic for oncology	0	28 (93.3)	2 (6.7)	30
Total	59	144	92	295

All clinics significantly more often do not mention patients' confidential information. Confidential data are most often not mentioned at the Clinic for oncology, and are least often not mentioned at the Clinic for internal diseases. They are most often mentioned at the Clinic for psychological medicine (although the answer "yes" and "sometimes" is also equally represented). The results are shown in Table 7.

The Chi-square test result is significant (χ^2 =76.03; p=0.00).

The analysis regarding the safety meeting shows that the Chi-square test result is significant (χ^2 =85.56; *p*=0.00), implying that the safety meeting is conducted significantly more often at the Clinic for otorhinolaryngology and maxillofacial surgery and the Clinic for oncology. It is least often done at the Clinic for anesthesiology, reanimation and intensive care; the largest number of respondents at this clinic does not know what a safety meeting is. The results are shown in Table 8.

Table 8. Was a safety meeting held before the nursing handover, with regard to the individual clinics?				
	Was a safety	meeting held handover	before the nursing ?	
	Yes (%)	No (%)	l don't know what a safety meeting is (%)	Total
Clinic for otorhinolaryngology	20 (71.4)	3 (10.7)	5 (17.9)	28
Clinic for anesthesiology, reanimation and intensive care	5 (11.1)	16 (35.6)	24 (53.3)	45
Clinic for respiratory diseases	16 (25.8)	27 (43.5)	19 (30.6)	62
Clinic for thoracic surgery	6 (21.4)	8 (28.4)	14 (50)	28
Clinic for psychological medicine	0	0	10 (100)	10
Clinic for surgery	17 (54.8)	7 (22.6)	7 (22.6)	31
Clinic for neurology	7 (31.8)	7 (31.8)	8 (36.4)	22
Clinic for internal diseases	8 (20.5)	13 (33.3)	18 (46.2)	39
Clinic for oncology	22 (73.3)	1(3.3)	7 (23.3)	30
Total	101	82	112	295

Table 9. Attitude to written instructions according to various clinics				
	Do you feel that a written set of instructions for the nursing handover should exist?			Total
	Yes (%)	No (%)		
Clinic for otorhinolaryngology	18 (64.3)	10 (35.7)	28	28
Clinic for anesthesiology, reanimation and intensive care	31 (68.9)	14 (31.1)	45	45
Clinic for respiratory diseases	49 (79)	13 (21)	62	62
Clinic for thoracic surgery	14 (50)	14 (50)	28	28
Clinic for psychological medicine	6 (60)	4 (40)	10	10
Clinic for surgery	16 (51.6)	15 (48.4)	31	31
Clinic for neurology	15 (68.2)	7 (31.8)	22	22
Clinic for internal diseases	32 (82.1)	7 (17.9)	39	39
Clinic for oncology	24 (80)	6 (20)	30	30
Total	205	90	295	295

Written instructions for nursing handover are considered necessary for the purpose of uniformity and the possibility of tracking and analysis. The Chi-square test result is significant (χ^2 =17.63; *p*=0.02). This means that clinics differ significantly with regard to the answers on the necessity of written instructions for the nursing handover. The results are shown in Table 9.

The Chi-square test result is significant (χ^2 =16.61; p=0.04) with regard to nurses' attitude towards the involvement of the patient in the handover. The results are shown in Table 10.

The Chi-square test result is not significant (χ^2 =7.60; p=0.47), i.e. there is no significant difference in conducting safety meetings with regard to the respondents' age. The results are shown in Table 11.

Table 10. Attitudes towards the involvement of the patient in the handover with regard to the respondents' age				
	Do you feel that	the patient shou	Ild be involved in the handover?	
	Yes (%)	No (%)	Depends on the condition of the patient (%)	Total
Less than 20 years	12 (14.6)	24 (29.3)	46 (56.1)	82
20 - 30 years	6 (13.3)	14 (31.1)	25 (55.6)	45
30 - 40 years	8 (9.4)	32 (37.6)	45 (52.9)	85
40 - 50 years	14 (27.5)	19 (37.3)	18 (35.3)	51
50 - 60 years	5 (15.6)	17 (53.1)	10 (31.3)	32
Total	45	106	144	295

Table 11. Safety meeting with regard to the respondents' age				
Was a safety meeting held before the nursing handover?				
	Yes	No	l don't know what a safety meeting is	Total
Less than 20 years	28	25	28	81
20 - 30 years	14	10	22	46
30 - 40 years	35	23	27	85
40 - 50 years	16	12	23	51
50 - 60 years	8	12	12	32
Total	101	82	112	295

Table 12. Written instructions with regard to the respondents' age				
	Do you feel that a written set of instructions for the nursing handover should exist?			
	Yes	No	Total	
Less than 20 years	56	25	81	
20 - 30 years	34	12	46	
30 - 40 years	57	28	85	
40 - 50 years	36	15	51	
50 - 60 years	22	10	32	
Total	205	90	295	

The Chi-square test result is not significant (χ^2 =7.04; p=0.95), i.e. there is no difference in attitude to written instructions for the handover with regard to the respondents' years in service. The results are shown in Table 12.

The Chi-square test result is significant (χ^2 =20.51; p=0.00). The largest number feels that this solely depends on the patient, especially among respondents with secondary school education and those with the title bachelor of nursing. The results are shown in Table 13.

Table 13. Attitude towards the involvement of the patient in the handover with regard to the respondents' education				
	Do you fee	el that the pat	ient should be involved in th	ne handover?
	Yes (%)	No (%)	Depends on the condition of the patient (%)	Total
Nurses with secondary education	14 (8)	74 (42.5)	86 (49.4)	174 (100)
Bachelor of nursing	26 (24.5)	28 (26.4)	52 (49.1)	106 (100)
Master of nursing/graduate nurse	5 (33.3)	4 (26.7)	6 (40)	15 (100)
Total	45	106	144	295

Table 14. The mention of a patient's confidential information with regard to the level of education Is confidential information about the patient being mentioned

	during the handover?			
	Yes	No	Sometimes	Total
Nurses with secondary education	32	86	56	174
Bachelor of nursing	22	51	33	106
Master of nursing/graduate nurse	5	7	3	15

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Table 15. Was a safety meeting held before the nursing handover, with regard to education level?				
	Was a s	afety meetii	ng held before the nursing h	andover?
	Yes	No	l don't know what a safety meeting is	Total
Nurses with secondary education	59	46	69	174
Bachelor of nursing	40	27	39	106
Master of nursing/graduate nurse	2	9	4	15
Total	101	82	112	295

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Table 16. Written instructions according to education				
	Do you f	eel that a writt hand	en set of instructions for over should exist?	r the nursing
	Yes (%)	No (%)	Total	Total
Nurses with secondary education	101 (58)	73 (42)	174 (100)	174
Bachelor of nursing	90 (84.9)	16 (15.1)	106 (100)	106
Master of nursing/graduate nurse	14 (93.3)	1 (6.7)	15 (100)	15
Total	205	90	295	295

Results pertaining to confidential information about the patient show that there is no significance with regard to education. The Chi-square test result is not significant (χ^2 =2.28; p=0.68). The results are shown in Table 14.

Total

According to results, the safety meeting before handover does not show significance with regard to the respondents' education. The Chi-square test result is not significant (χ^2 =8.89; *p*=0.64). The results are shown in Table 15.

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295

Results with regard to written instructions for handover and the respondents' level of education show significance, mostly among respondents with the highest level of education. Respondents feel that a written set of instructions for the nursing handover should exist. The Chi-square test result is significant (χ^2 =26.65; p=0.00). The results are shown in Table 16.

Discussion

In Croatia the Law on Nursing requires nursing handover to be recorded in written form. For that reason, it was of great importance to the author to find out how the nursing handover is recorded. The data obtained is very interesting because there is a range of recording types, from written records kept in a notebook, to written handover in electronic form combined with handover at the bedside. As already mentioned, the law only prescribes a written record in electronic form, but nurses recognize the need for oral transmission of patient information. They do this either orally in the nurses' room or at the patient's bedside. According to studies, the nursing handover is one of the key elements of safe and quality care (6). It is also stated that just a written record is not sufficient to pass on all the necessary information about the condition of the patient. The combination of a written record and bedside handover is considered to be the best way to conduct nursing handover.

Fiket in her paper also states that bedside handover is more advantageous than the handover in the nurses' room, that the most common distractor is the medical staff, and that it is necessary to use nursing documentation. The author also states that there is room for improvement (8).

If the nursing handover, in addition to a written record, also takes place at the bedside, then the patient is involved in the transfer of information about his or her condition and this results in greater patient satisfaction. The patient knows which nurses have arrived to the shift, which tests and procedures he or she can expect today, and he or she also has the opportunity to ask additional questions. The question of involvement of the patient in the nursing handover shows that 48.8% of respondents believe that this depends on the condition of the patient, while 35.9% of respondents believes that the patient should not be involved in the nursing handover. There is statistical significance regarding the involvement of patients in the nursing handover with regard to the individual clinics. The respondents at the Clinic for anesthesiology, reanimation and intensive care least often feel that the patient's involvement during nursing handover is necessary. This is due to the fact that patients in the aforementioned clinic are, in most cases, sedated, relaxed, and on mechanical ventilation.

Of course, this type of nursing handover includes the additional issue of confidential information. This issue is especially important when the patient is not alone in the room. It is then necessary to protect the integrity of the patient and to respect his or her privacy. The question of confidential information also has a significant Chi-square test result with regard to individual clinics and shows that confidential information is least mentioned at the Clinic for oncology, and most mentioned at the Clinic for psychological medicine (it is important to note that the number of respondents from the Clinic for psychological medicine was small, so it is not possible to draw a reliable conclusion).

A safety meeting is cited as an important element before the handover itself, when information is transferred that is not always related to the patient. This refers to information such as a malfunction of an appliance, an electronic system update, an elevator failure, etc. The safety meeting question provided the information that 38% of respondents do not know what a safety meeting means. In this case the Chi-square test result is also significant with regard to the individual clinics and shows that the safety meeting is mostly held at the Clinic for otorhinolaryngology and maxillofacial surgery and the Clinic for oncology. It is least often held at the Clinic for anesthesiology, reanimation and intensive care, but there the largest number of respondents does not know what a safety meeting is.

The importance of written instructions about nursing handover should not be the subject of discussion, because having instructions on something helps us do it better. This is also confirmed by studies (9). Interestingly, only 69.5% of respondents believe that written instructions should exist.

Conclusion

The questionnaire was filled in by 295 nurses. The majority of participants finished secondary school education and has been working between 10 and 20 years. The most common way of recording nursing handover is in electronic form, as well as at the patient's bedside. This style of nursing handover ensures better continuity of care, patient safety, and better quality care. Nurses are aware of the benefits of good quality handover and feel that handover represents a key element of the care they provide. The nursing handover in most cases lasts between 10 and 15 minutes.

Conducting a safety meeting before the nursing handover contributes to greater safety for both patients and nurses. If we compare the holding of safety meetings between individual clinics, the Chisquare test result is significant.

As for the issue of the need for written instructions for the nursing handover, all clinics believe that such instructions should exist. This would ensure the uniformity of records and enable an analysis of record quality.

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PERCEPCIJA MEDICINSKIH SESTARA O PRIMOPREDAJI SESTRINSKE SLUŽBE U KBC-u ZAGREB

Sažetak

Uvod. Sestrinska primopredaja službe jest komunikacija koja se odvija između dviju smjena medicinskih sestara čija je specifična svrha predavanje informacija o pacijentima o kojima skrbe medicinske sestre. Postoji nekoliko stilova primopredaje sestrinske službe, a u Hrvatskoj je zakonski obvezna pismena primopredaja.

Cilj. Istraživanje je imalo za cilj ispitati percepciju medicinskih sestara o primopredaji sestrinske službe: pridonosi li primopredaja sestrinske službe većoj sigurnosti pacijenata, utječe li sadržaj primopredaje na kvalitetu provođenja zdravstvene njege te je li primopredaja važna za kontinuitet sestrinske skrbi. Također, cilj je bio utvrditi na koji se način provodi primopredaja sestrinske službe, koliko traje te jesu li potrebne pisane upute za primopredaju sestrinske službe.

Metode. Istraživanje je provedeno u periodu od 1. do 30. listopada 2017. Istraživanje je provedeno putem upitnika izrađenog u tu svrhu. Upitnik se sastojao od 14 pitanja: prvi dio upitnika odnosi se na demografske podatke ispitanika: godine radnog staža, godine života, spol, razina obrazovanja, mjesto rada; drugi dio upitnika odnosio se na percepciju medicinskih sestara o primopredaji sestrinske službe.

Rezultati. Upitnik je ispunilo 295 medicinskih sestara i tehničara. Od toga je broja 40 muških osoba, a 255 ženskih. Najveći je broj ispitanika srednje stručne spreme i radi između 11 i 20 godina. Sestrinska primopredaja u najvećem se postotku bilježi u elektroničkom pismenom obliku te uz krevet bolesnika. Više od 90 % ispitanika smatra da primopredaja pridonosi većoj sigurnosti bolesnika te boljoj kvaliteti skrbi.

Zaključak. Primopredaja sestrinske službe bilježi se u elektroničkom pismenom obliku i uz krevet bolesnika na svim odjelima obuhvaćenima istraživanjem. Takav oblik primopredaje osigurava bolji kontinuitet skrbi, veću sigurnost bolesnika i smanjuje mogući gubitak važnih informacija. Pokazuje se potreba za izradom pisanih uputa o primopredaji sestrinske službe.

Ključne riječi: primopredaja sestrinske službe, sigurnost bolesnika, smjernice za primopredaju službe, sigurnosni sastanak, lista primopredaje

Parent Satisfaction with Children's Health Care in the Children's Hospital Zagreb

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Abstract

Aim. The goal of the research is to assess parent satisfaction with children's health care in the Children's Hospital Zagreb and to determine whether there were differences in their assessment with regard to the clinic at which the child is hospitalized.

Methods. The sample included 160 participans (parents of children hospitalized in the Clinic for Pediatric Surgery and the Pediatric Clinic in the Children's Hospital Zagreb). As a research method an anonymous modified Picker questionnaire was used. Participation in the research was voluntary.

Results. 36.9% of respondents think that their children's health care is excellent, 43.8% think it is very good and 15% think it is good. 58.1% of parents believe that their child was frightened during hospitalization. 53.8% of respondents rated the hospital food as good, 98.8% of them said they have confidence and trust in the doctors and nurses who take care of their child. 4.4% of parents felt they were not sufficiently involved in decision-making about their child. 72.5% of children during hospitalization felt pain. Parents of children hospitalized in surgical departments have a better opinion of alleviating pain.

Conclusions. 81% of respondents assesed the care of their child as very good or excellent and there is no significant difference in satisfaction with regard to the clinic at which the child is hospitalized. The variables found to have a correlation with the total satisfaction score are: a sense of confidence and trust in doctors, psychological preparation of the child, parents' perception of participating in their child's care, quality of the food, perception of parents about safety on the ward.

Introduction

In the last century, the relationship toward the children has changed significantly and it is said that the 20th century is "The Century of the Child" because a number of international documents in favor of children were adopted, such as the Declaration on the Rights of the Child and in 1989 the Convention on the Rights of the Child (1). With such a commitment, ideas of "open hospital" also appear (2). The European Parliament in 1986 adopted the European Charter for children in hospital which also defines the Children's Rights List at the Hospital. These documents provide the basis and some kind of incentive to do more for hospitalized children (3).

Special psychological and social problems are associated with the treatment of the children. The positive effect of hospitalization refers to the treatment of the disease itself and recovery as the ultimate goal. However, hospitalization also has a negative psychological impact on the child that reflects on his personality. In a hospital, an individual's lifestyle has been disturbed. There is a high degree of dependence on the others and disturbing events occur. The basis for the humanization of hospital treatment is the individual approach to every child, providing parents' day-to-day opportunities, involving parents in the treatment, application of pedagogical, cultural, entertaining contents and playing games during hospitalization.

One of the possible tools for assessing satisfaction in pediatrics is HUG (Help, Understanding, Guidance for Young Families). It is an innovative approach for pediatric nurses that is developed and designed to support parents in optimizing their children's health and well-being. Research results show that there is a definite gap between what pediatrics promises and provides and between what parents want from their service providers and what they actually get. HUG is a handy practical manual that can be used by pediatric nurses at all levels and in different environments. The use of HUG in nursing helps improve parenting, helps parents feel that they are heard and that they participate, encourages parents to share what they care most about and increase the satisfaction with nurses' work (4).

Norway has developed NORPEQ (Norvay Patient Experiences Questionnaire) that quickly collects pa-

tient experiences and covers important aspects of health care. In developing the questionnaire, the following three conditions had to be met: to include the most important aspects of patient experience based on relevant literature in the Nordic countries; that the questionnaire is short enough for it to be able to be implemented in existing research and that it should be written in Norwegian language, after which it will be translated into other Nordic languages. This questionnaire proved useful in terms of reliability and validity and is relatively easily implemented in existing routine surveys (5).

In 2005, Holzer and Minder conducted research in 24 hospitals in Switzerland (Bern) using standardized Picker's methodology. In their work from 2011, they presented standardized and relatively simple methods for analyzing and using patient experience data for quality improvement and for publication in a form that provides a clear and simple interpretation. There are three steps: 1. Identify the factors that contribute most to the variability of patient experience versus patient and hospital level; 2. Presentation of approaches for achieving fair and transparent assessment of hospitals for internal and external evaluation. 3. Suggesting procedures for using data to identify areas for improvement.

Questionnaire "Child ZAP" in Germany was developed by Bitzer and his associates. It is a standardized assessment questionnaire for parents in ambulatory pediatric care planned to be used in quality management. A questionnaire (Child ZAP), which was adapted through time, received a final form of eight dimensions, three "children's scales" and five "parental scales". With good results for validity and reliability testing, the ultimate "Child ZAP" is applicable in pediatric outpatient care for children of all ages. The child questionnaire is longer than the one for adults. Its design and simplicity make for a flexible implementation of a survey that meets different quality management requirements (6).

There are scientific evidence that the satisfaction of the parents of a hospitalized child is related to parental involvement, understanding and retention of medical information and the continuity of care (7).

The way of communicating with a child during a hospital stay depends on the child's age, cognitive and emotional maturity and it is important that all profiles of professionals adapt their approach to the development phase and the individual needs of

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the child. The most frequent complaints of parents of sick children related to the communication with healthcare workers are: insufficient time dedicated to them, insufficient information and communication in incomprehensible manner with the use of professional terms.

The goal of the research is to assess parent satisfaction with children's health care in the Children's Hospital Zagreb and to determine whether there were differences in their assessment with regard to the clinic at which the child is hospitalized.

Methods

This study is cross-sectional. Respondents are parents of children hospitalized at two clinics in the Children's Hospital Zagreb. A total of 160 respondents participated in the study (80 parents of children hospitalized in the Pediatric Surgery Clinic and 80 parents of children hospitalized in the Pediatric Clinic). Research was conducted during a three month period (June – August 2015).

During designing the questionnaire used for collecting the data in this study we have used the Picker's Surveillance Survey (8), whose questions were modified and adapted to the environment in which the research was conducted. The guestionnaire contained 52 guestions, of which 51 were closed-ended guestions while one question had to be written on the line (age of the child). The first part of the survey referred to the admission of the child to the hospital (4 questions), the second part referred to the hospital department (13 questions), two of which were related to the activities of the department, while one question was related to food. The third group of questions referred to the physician's assessment (4 questions) and the fourth to the nurses (5 questions). The chapter about child care in the hospital contained 7 questions, while the part about the pain contained 2 questions. There were 6 questions in the operation group and 4 questions related to the diagnostic procedures. The foregoing chapter is conceived as the overall rating of parenting with child care (1 question). The last part of the questionnaire was about general information (gender and age of the child, previous hospitalization, presence of chronic illnesses and long-term conditions) and information on the program "Children's departments friends of children" and evaluation of the same in the department where the child is hospitalized. Relevant answers are shown in the Results section.

After receiving written and verbal information about research, every participant individually had received informed consent form and anonymous questionnaire. After completing the questionnaire they returned it in a sealed envelope.

Ethics

Before conducting research, Ethics Committee of the Children's Hospital Zagreb had given consent. All respondents had received written and verbal information about research and they had signed informed consent. The questionnaire was anonymous.

Statistics

Category data are shown in absolute and relative frequencies. The difference in the distribution of the categorical variables among the observed groups was examined by Fisher's exact test and the Chi-Square test. All p values were two-sided. The level of significance was set at *p*=0.05. Correlation of nominal variables is expressed with contingency coefficient (C). To estimate the mean and variability of numerical data, the central value (median) and the interquartile range were used because of an asymmetric distribution. The normality of the distribution of numerical variables was tested by Kolmogorov-Smirnov test. Mann-Whitney test was used to compare the differences between two numerical variables. IBM SPSS Software was used for the statistical analysis.

Results

A total of 160 examinees (80 parents of children hospitalized in the Clinic for Pediatric Surgery and 80 parents of children hospitalized in the Pediatric Clinic in the Children's Hospital Zagreb) participated in this study.

Most of the children hospitalized in the Clinic for Pediatric Surgery were male (62.5%), while in the Pediatric Clinic the proportion of girls and boys was the same (Chi square test, p=0.111). The mean value of the age of children hospitalized in the Clinic for Pediatric Surgery (6.0) was statistically significantly higher (Mann-Whitney test, p<0.001) than the median value of children hospitalized in the Pediatric Clinic (2.50).

Most children hospitalized in the Clinic for Pediatric Surgery (86.2%) and Pediatric Clinic (85.0%) have no long-term condition. Equal number of children in both departments (2.5%) have a diagnosis of deafness or severe hearing impairment and blindness or partial visual impairment (1.2%). Mental health problems have 2.5% of children hospitalized in the Clinic for Pediatric Surgery and 3.8% of children hospitalized in the Pediatric Clinic. The same number of children in both clinics (7.5%) suffer from some other long-term condition (malignant disease, diabetes, epilepsy).

The first group of questions concerned admitting a child to a hospital. The observed groups differ significantly with respect to the admission type - emergency admission or planned visit (Fisher's exact test, p<0.001). While the largest number of children are admitted through a regular procedure (60%), most of the children in the pediatric department were hospitalized through emergency, unplanned hospital admission (70%). Most of the children staved in mixed rooms, where there were children of both sexes (surgery - 50%, pediatrics - 78.8%). While 35.0% of children stayed in the room for the same sex in the surgical department, only 16.2% of children hospitalized in the Pediatric Clinic were staying in that type of room. There is a significant statistical difference between the observed groups (Chi square test, p=0.001).

When they were asked if the child was ever frightened during the hospital stay, most parents of children hospitalized in the Clinic for Pediatric Surgery said that it was not the case (50.0%) and 7.5% was very scared. The largest share of children hospizalized in the Pediatric Clinic according to parents' opinion was somewhat frightened (38.7%), while very scared was 27.5% of children. There is a significant statistical difference between the observed groups (Chi square test, p=0.003) (Table 1).

The largest number of parents of children hospitalized in the Clinic for Pediatric Surgery believe that physicians have fully talked to their child in a way that the child could understand (48.8%), while most parents of children hospitalized in the Pediatric Clinic stated that their child was too small to understand (41.2%), with significant difference (Chi square test, p<0.001) (Table 2).

The largest number of parents of children hospitalized in both clinics believe that doctors have consistently provided information on child care and therapy in a comprehensible manner (more of respondents from the Clinic for Pediatric Surgery - 81.2%, compared to the Pediatric Clinic - 60.0%) (Fisher's exact test, p<0.001).

The largest number of parents of children hospitalized in both clinics believe that nurses have fully talked to their child in a way that the child could understand (the Clinic for Pediatric Surgery - 62.5%, the Pediatric Clinic - 38.8%), while also 37.5% of parents of children hospitalized in the Pediatric Clinic said their child was too small to understand (Fisher's exact test, p=0.002). Most of the respondents believe that nurses constantly provided them with information on child care and therapy in a comprehensible way, significantly more respondents from the Clinic for Pediatric Surgery - 82.5%, compared to the Pediatric Clinic - 62.5) (Fisher's exact test, p=0.014) (Table 3).

The largest number of respondents from both clinics considered that there are always enough nurses who care for their child (the Clinic for Pediatric Surgery - 76.3%, the Pediatric Clinic - 67.5%). Most of the respondents reported that they had confidence in nurses who care for their child at all the time (significantly more respondents from the Clinic for Pediatric Surgery - 83.6%, compared to the Pediatric Clinic - 65%), while 2.5% of respondents at both departments have no confidence in their nurses (Fisher's exact test, p=0.012) (Table 4).

When asked if they are allowed to spend the night with their child in the hospital department, the larg-

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Table 1. Parental perception of child's fear during hospital stay					
			Clinic		
		Clinic for Pediatric Surgery	Pediatric Clinic	Total	p *
		N (%)	N (%)	N (%)	
Has your child ever been frightened during a hospital stav?	Yes, very much	6 (7.5)	22 (27.5)	28 (17.5)	0.007
	Yes, somewhat	34 (42.5)	31 (38.7)	65 (40.6)	
	No	40 (50.0)	27 (33.8)	67 (41.9)	0.005
5	Total	80 (100.0)	80 (100.0)	160 (100.0)	

 $^{*}\chi^{2}$ test

Table 2	2. Evaluation of docto	r's communication	with the chil	d	
			Clinic		
		Clinic for Pediatric Surgery	Pediatric Clinic	Total	P*
		N (%)	N (%)	N (%)	
Have the doctors talked to your child about how they would care for him or her, in a way that the child could understand?	Yes, absolutely	39 (48.8)	20 (25.0)	59 (36.9)	
	Yes, somewhat	20 (25.0)	16 (20.0)	36 (22.5)	
	No	3 (3.8)	11 (13.8)	14 (8.8)	
	l do not remember	4 (5.0)	0 (0.0)	4 (2.5)	<0.001
	The child is too young to understand	14 (17.4)	33 (41.2)	47 (29.3)	
	Total	80 (100.0)	80 (100.0)	160 (100.0)	

 $^{*}\chi^{2}$ test

Tabl	e 3. Providing inform	ation on child care a	and therapy		
			Clinic		
		Clinic for Pediatric Surgery	Pediatric Clinic	Total	p *
		N (%)	N (%)	N (%)	
Did the nurses give you information about your child's care and therapy in the way you could understand	Yes, absolutely	66 (82.5)	50 (62.5)	116 (72.5)	
	Yes, somewhat	11 (13.8)	26 (32.5)	37 (23.1)	
	No	3 (3.7)	4 (5.0)	7 (4.4)	0.01.4
	Total	80 (100.0)	80 (100.0)	160 (100.0)	0.014
	* Fisher's exact test	14 (17.4)	33 (41.2)	47 (29.3)	
	Total	80 (100.0)	80 (100.0)	160 (100.0)	

* Fisher's exact test

Tal	ble 4. The feeling of t	rust and confidence	in nurses		
			Clinic		
		Clinic for Pediatric Surgery	Pediatric Clinic	Total	P*
		N (%)	N (%)	N (%)	
	Yes, all the time	67 (83.8)	52 (65.0)	119 (74.4)	
Do you have confidence and	Yes, most of the time	11 (13.8)	26 (32.5)	37 (23.1)	0.01.2
about your child?	No	2 (2.5)	2 (2.5)	4 (2.5)	0.012
5	Total	80 (100.0)	80 (100.0)	160 (100.0)	
* Fisher's exact test					

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est number of respondents from the Clinic for Pediatric Surgery answered that they are not allowed (86.2%), while 72.5% of respondents from the Pediatric Clinic answered confirmatory to the same question (Fisher's exact test, p<0.001).

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Significantly more of the respondents from the Clinic for Pediatric Surgery (85.5%) compared to the respondents from the Pediatric Clinic (67.3%) considered that doctors and nurses did absolutely everything they could to alleviate the child's pain (Fisher's exact test, p=0.034) (Table 5).

Also, significantly more respodents from the Clinic for Pediatric Surgery (77%) compared to the respondents from the Pediatric Clinic (52.6%) considered that before the surgery/procedure the doctor fully answered their questions in a comprehensible way (Fisher's exact test, p=0.021). When they were asked to evaluate the care their child received while in hospital, the parents of the children hospitalized in the Clinic for Pediatric Surgery responded as follows: the same number of respondents considered the care as excellent (42.5%) and very good (42.5%), 12.5% of parents rated the care as good, 2.5% of the respondents as acceptable and none of the respondents considered the child's care to be poor. Parents of children hospitalized in the Pediatric Clinic most often rated their child's care as very good (45%), secondly as excellent (31.2%), while 17.5% of respondents thought their child was receiving good care. 5% of parents rated the care as acceptable and 1.2% thought the care was poor.

The variables related with the overall care rating are: a sense of confidence and trust in the doctors (C = 0.610, p<0.001), preparation of the child for a procedure (C=0.600, p<0.001), a parent's feeling that they can participate in the care for child (C=0.520, p<0.001), hospital food quality assessment (C=0.518, p<0.001), parental perception of child safety at the hospital unit (C=0.511, p<0.001) (Table 6).

160 (100.0)

80 (100.0)

Table	5. Assessment of a	dequacy of relieving	child's pain		
			Clinic		
		Clinic for Pediatric Surgery	Pediatric Clinic	Total	P*
		N (%)	N (%)	N (%)	
	Yes, all the time	67 (83.8)	52 (65.0)	119 (74.4)	
Do you think doctors and nurses do all they can to relieve your child's pain?	Yes, absolutely	53 (85.5)	37 (67.3)	90 (76.9)	
	Yes, somewhat	9 (14.5)	17 (30.9)	26 (22.2)	0.034
	No	0 (0.0)	1 (1.8)	1 (0.9)	
	Total	62 (100.0)	55 (100.0)	117 (100.0)	
* Fisher's exact test					
Table 6. The ⁻	total assessment of	the child's care rece	ived at the I	nospital	
			Clinic		
		Clinic for Pediatric Surgery	Pediatric Clinic	Total	p*
		N (%)	N (%)	N (%)	
	Excellent	34 (42.5)	25 (31.2)	59 (36.9)	
	Very good	34 (42.5)	36 (45.0)	70 (43.8)	
How would you evaluate	Good	10 (12.5)	14 (17.5)	24 (15.0)	0 4 5 1
during hospitalization?	Acceptable	2 (2.5)	4 (5.0)	6 (3.8)	0.451
daming hospitalization:	Poor	0 (0.0)	1(1.2)	1 (0.6)	

80 (100.0)

Total

Discussion

The questionnaire was adjusted to the environment in which the satisfaction of the parent was examined and it was structurally and substantively divided into several units. The first part of the survey referred to the admission of children in the hospital, where it was found that departments differed significantly with regard to the type of emergency or planned admission.

While the largest number of children was hospitalized in the Clinic for Pediatric Surgery through the planned admission, most children in the Pediatric Clinic are admitted through emergency, unplanned admission. From this data, it is evident that the very nature of the illness for which the child is admitted to hospital is different, so it can be assumed that the parent's response to hospitalization is less stressful in the case of planned admission where parents had more time and opportunities to prepare themselves, as well as their child.

More than half of the respondents thought their child was frightened during their stay in the hospital. The largest share of children in the Pediatric Clinic according to parents' opinion was somewhat frightened. This result can be explained by the fact that the greater number of children hospitalized in the Pediatric Clinic was subjected to different tests that we can assume are the main source of pain and fear in hospitalized children. Major sources of fear include painful procedures such as venepuncture, injections, infusion and separation from the parent (9). Most of the respondents rated the hospital food as good, which would be a grade 3 on a scale of 1 to 4. In the research conducted in 2014 (10), the possibility to play games and quality of nutrition was given the worst grade of all the variables examined, also with the possibility of participating in a decision on therapeutic and diagnostic procedures. It has already been noted in previous research that a certain number of children does not consume hospital food with pleasure (11).

Regarding assessing the quality of communication with a physician and nurses, the results of this study are consistent with other sources in the literature (9,10,12,13,14), meaning that the criteria for appropriate communication in healthcare are met. The majority of parents believe that doctors have fully

talked to their child in a way that the child could understand (taking into account the age of the child).

Most respondents believe that their doctors constantly provided information on child care and therapy in a comprehensible way, a small number of respondents said that doctors talk to other hospital staff in front of the parents and children as if they were not in the room. The satisfaction with communication with a doctor is best explained by the fact that the vast majority of parents from both groups had confidence and trust in doctors who treat their child.

The quality of communication of nurses with children and parents is assessed by high rating. The largest number of parents believe that nurses fully talked to their child in a way that the child could understand (taking into consideration the age of the child). Although most respondents from both groups believe that their nurses constantly provide information on child care and therapy in a comprehensible manner, there is a significant statistical difference between the groups in this section of the assessment (82.5% from the Clinic for Pediatric Surgery and 62.5% from the Pediatric Clinic). Likewise, they differ in answers to the question whether nurses are talking to other hospital staff in front of the parents and children as if they were not in the room. Although the vast majority of respondents responded that this is not the case, 20% of parents believe that nurses employed in the Pediatric Clinic occasionally do so, while 10% think that they do it often. As expected, there is also a significant difference in a continuous sense of trust and trust in nurses - 83.6% respodents from the Clinic for Pediatric Surgery, 65% respondents from the Pediatric Clinic. Most respondents did not receive a different opinion from the staff. It has been proven that the more problems in communication parents allegate, they are less satisfied with health care (15). Effective communication is related to relative satisfaction with care and adherence to treatment recommendations (16).

When they were asked whether they are involved in deciding about child care and therapy as much as they wanted, two-thirds of the parents of children hospitalized in the Clinic for Pediatric Surgery and nearly half of the parents of children hospitalized in the Pediatric Clinic believed that this was certainly true. The results show that parents of children hospitalized in the Pediatric Clinic had a significantly lower chance of talking to doctors and nurses alone. Most parents believe that their child was provided with timely assistance when eating or using the toilet, if necessary. The largest number of respondents from both clinics considered that they have the option of taking part in child care to the extent that is necessary, which is somewhat different from the results in other research (10).

It is apparent that the assessment of communication is higher for the Clinic for Pediatric Surgery than for the Pediatric Clinic. Given that the possibility of overnight staying with the child is significantly higher in the Pediatric Clinic, we can assume that in this study this possibility did not have a significant impact on the satisfaction assessment. Although numerous studies have shown that attitudes of parents about a 24-hour stay with a child are extremely positive, no correlation with the overall assessment of satisfaction was observed in this research. There is a possibility that the average age of a hospitalized child had an impact on a lower assessment of some aspects of communication in the Pediatric Clinic. The central value of the age of children hospitalized in the Clinic for Pediatric Surgery (6.0), compared to the central value of children hospitalized in the Pediatric Clinic (2.50), is significantly higher. We can assume that the higher incidence of emergency admissions and the lower age of the child caused a higher level of stress in the parents, which consequently affected the assessment.

Regardless of the clinic where they were hospitalized, most children felt pain during hospitalization, which could be related to the various diagnostic tests and the surgical procedure themselves. Although the majority of respondents from both clinics believed that doctors and nurses made absolutely everything they could to relieve the child`s pain the answers to this question are statistically different with regard to the clinic (respondents from the Clinic for Pediatric Surgery have a better opinion about pain relief).

As expected, most children from the Clinic for Pediatric Surgery had undergone a surgical procedure or a diagnostic procedure, while that number in the Pediatric Clinic was three times smaller. According to the previous results of a high degree of satisfaction with the communication of healthcare professionals, parents are generally very pleased with explaining the operation of a child by a doctor, answering questions, explaining the risks and benefits of the operation/ procedure by the surgeon and explaining the outcomes of the operation. When they were asked to evaluate the care their child received while staying in hospital, the parents of children hospitalized in the Clinic for Pediatric Surgerv responded as follows: the same number of respondents considered the care excellent (42.5%) and very good (42.5%), 12.5% of parents rated the care as good, 2.5% of the respondents as acceptable and none of the respondents considered the child's care to be poor. Parents of children hospitalized in the Pediatric Clinic most often rated the care their child received while in hospital as very good (45%), as excellent (31.2%), while 17.5% of respondents thought the care was good. 5% of parents rated the care as acceptable and 1.2% thought the care was poor. The obtained assessment is consistent with other research of this or similar topics carried out in the territory of the Republic of Croatia, where the most frequent assessment of care in numerical form ranges from 4.0 to 4.5 (9,10,13,17). A total of 80.7% of respondents believe that the care their child received in hospital was very good or excellent, providing the best insight into the degree of parent satisfaction.

Variables connected with the overall assessment of care are: a sense of trust and trust in doctors, preparation of children for diagnostic tests, parents feelings that they can take part in child care, hospital food quality assessment, parents' perception of child safety at the hospital department. Surprisingly, in these 5 variables that have the strongest connection to the satisfaction assessment there is no communication. It is possible to explain that communication has not been investigated in the whole context but through specific areas, so it is difficult to determine the overall impact on satisfaction assessment. The feeling of trust and confidence in doctors and the parent's perception of the child's safety at the hospital department belong to the group of needs for safety, according to A. Maslow, in the second place, immediately after physiological needs (18). The number of authors agrees about the benefits of parents staying in hospital for the whole family. The child feels safer and it reduces emotional stress. Psychological preparation for diagnostic and therapeutic procedures is required for every child regardless of their age. The way of communication with children during their stay in the hospital depends on the child's age, cognitive and emotional maturity and it is important that all profiles of professionals adapt their approach to the development phase and the individual needs of the child (19).

One third of the respondents was not informed of the existence of the program "Children's Departments - Children's Friends" and 76.9% of all respondents believe that the hospital is implementing the program. We can conclude that the evaluation of the program is very good, while the parent's awareness of this program is slightly weaker.

By examining the available literature, a relative lack of published papers on this or similar topics was noticed. In Croatia, a pilot study on parents' and children's experiences was conducted in Croatia in 2014 using a Picker's questionnaire, organized by the Central Coordination Board of the "Childhood Smiling Hospital" action and the results are presented at the thematic counseling "Experiences of Children and Parents during Hospitalization" in the Clinic for Children's Diseases Zagreb held on May 19, 2014 (20). There is a need for a standardized measuring instrument (questionnaire) at the level of the Republic of Croatia so that there would be a possibility of comparing research conducted in different parts of the country.

Conclusion

A total of 81% of respondents believe that the care for their child was very good (44%) or excellent (37%) and there is no statistically significant difference in assessing parents' satisfaction with child health care with regard to the clinic where the child was hospitalized. Variables that are positively connected with parent's satisfaction are: a sense of trust in doctors, preparation of a child for a diagnostic procedure, a parent's feelings that they can take part in child care, hospital food quality assessment, parents' perception of child safety at the hospital department. Parents are very satisfied with the communication with the doctors and nurses. More than half of the respondents believe that their child was frightened during their stay in hospital and more than one-third of respondents believe that toys that exist in the department are not adapted to the age of their child. Most respondents rated the hospital food as good. 98.8% of respondents said they had confidence and trust in physicians and nurses who care about their child. Less than 5% of all respondents think they are not sufficiently involved in deciding on child care and therapy. According to parents' estimates, around 70% of children felt pain during hospitalization. Less than 1% of parents are dissatisfied with the treatment of their child's pain and respondents from the Clinic for Pediatric Surgery have a better opinion about adequacy of relieving the child's pain.

There is a need for a standardized measuring instrument (questionnaire) to be used continuously in pediatric departments at the level of the Republic of Croatia. This would allow for a comparison of research carried out in different parts of the country. The research would gain insight into current pediatric care problems, which would facilitate the formation of strategies to increase the satisfaction of hospitalized children and their parents and ultimately result in improving the quality of the health system.

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ZADOVOLJSTVO RODITELJA ZDRAVSTVENOM SKRBI DJECE U KLINICI ZA DJEČJE BOLESTI ZAGREB

Sažetak

Cilj. Procijeniti stupanj zadovoljstva roditelja zdravstvenom skrbi djece u Klinici za dječje bolesti Zagreb te utvrditi postoje li statistički značajne razlike u procjeni zadovoljstva roditelja zdravstvenom skrbi djece s obzirom na kliniku pri kojoj je dijete hospitalizirano.

Metode. Ispitanici su roditelji djece hospitalizirane na Klinici za pedijatriju i Klinici za dječju kirurgiju pri Klinici za dječje bolesti Zagreb (njih 160). Primijenjen je modificirani upitnik za procjenu zadovoljstva roditelja bolničkom skrbi djece prema Institutu Picker. Sudjelovanje u istraživanju bilo je dobrovoljno.

Rezultati. 36,9 % roditelja smatra skrb odličnom, 43,8 % vrlo dobrom, 15 % dobrom. Da je skrb prihvatljiva smatra 3,8 % ispitanika, a jedan je ispitanik (0,6 %) skrb procijenio kao lošu. 58,1 % ispitanika smatra da je njihovo dijete bilo uplašeno tijekom boravka u bolnici. 53,8 % ispitanika bolničku je hranu ocijenilo dobrom, 98,8 % roditelja izjavilo je kako imaju pouzdanja i povjerenja u liječnike i medicinske sestre koji se brinu o njihovu djetetu. 4,4 % roditelja smatra kako nisu dovoljno uključeni u odlučivanje o skrbi o njihovu djetetu. 72,5 % djece tijekom hospitalizacije osjećalo je bol, samo je jedan roditelj (0,9 %) nezadovoljan tretiranjem boli djeteta, a ispitanici s kirurškog odjela imaju bolje mišljenje o ublažavanju boli.

Zaključak. Ukupno 81 % ispitanika smatra da je skrb o njihovu djetetu vrlo dobra ili odlična te ne postoji znatna razlika u procjeni zadovoljstva s obzirom na kliniku pri kojoj je dijete hospitalizirano. Varijable su kod kojih je utvrđena povezanost s ukupnom ocjenom skrbi: osjećaj pouzdanja i povjerenja u liječnike, priprema djeteta za provođenje pretrage, osjećaj roditelja da može sudjelovati u skrbi za dijete, procjena kvalitete bolničke hrane, percepcija roditelja o sigurnosti djeteta na bolničkom odjelu.

Ključne riječi: skrb o djeci, zadovoljstvo, roditelji

Opinions of the Final Year Secondary Health Care Students and the Final Year Students of the Undergraduate Nursing Study Programme About Organ Donation

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Keywords: organ donation, organ transplantation, secondary school students, college students

Abstract

Aim. To examine and compare the opinions of the final year secondary health care students and the final year students of the undergraduate Nursing study programme about the significance of organ donation.

Methods. A cross-sectional study was conducted on a sample of 60 participants of whom 30 were undergraduate Nursing study programme students and 30 were secondary health care students. The research instrument was a questionnaire designed for the purpose of this study, which included the following groups of questions: the first group consisted of questions about the participants' general data, while the second group contained questions about organ donation itself.

Results. From the obtained results, it was determined that there is no statistically significant difference in the decision to donate organs depending on the level of education. Furthermore, the results show that both groups of participants want to donate organs and the main motivation is to rescue someone's life. In addition, the majority of participants express the view that such behavior is a humane act.

Conclusion. Education level does not affect organ donation decision-making. The main motivation for deciding on donating organs is to rescue someone's life. Organ donation is an act of humanity. In the survey, several respondents expressed negative opinion about organ donation. Therefore, it is recommended that workshops aimed at future health professionals, be organized in secondary health care schools and other educational institutions for healthcare professionals to emphasize the importance of organ donation.

Introduction

According to the Medical Lexicon, transplantation is defined as "transplanting tissues or organs from one individual to another" (1). Organ transplantation refers to the transfer of an entire organ or parts of organs, cells or tissues from one person to another (1,2).

Considering the organ donors, an organ can be transplanted from a *living* (ex vivo) or a *deceased* donor (ex cadavere) (2). Referring to the organ donor and recipient, we differentiate between *autologous* (from one place on the same body to another, e.g. skin), *homologous* (between the same species, from one person to another) and *heterologous* (between different species, from an animal to a human) organ transplantation (3,4). Also, there has been an increase in the use of artificial organs, the so-called *implants* or engineered organs (2).

Body parts for the transplantation can only be retrieved from a deceased person after they have been declared to be dead by established medical criteria and methods of determining death (5). Organ transplantation process from a deceased person can only begin after the donor has been declared brain dead. Brain death signifies permanent loss of all brain functions of the cerebrum, cerebellum and the brainstem. When brain death occurs, no therapeutic interventions can restore it to its original functional state. Tests performed by a multidisciplinary team of specialists and nurses are used to prove brain death. These tests need to be repeated at least twice, and the end of the brain death diagnosis marks the time of death (2,4).

The success of the organ transplantation procedure depends on the appropriate care for the donor after brain death diagnosis, which implies maintaining vital functions and preserving organs. The role of the nurse is essential in care for the organ recipient and the donor, during the explantation and transplantation process, and is manifested in interventions such as vital functions monitoring, airway passage maintenance and care to maintain proper artificial ventilation parameters, maintenance of cardiovascular system function, maintenance of fluids balance and normal body temperature, prevention of infection and the preservation of normal endocrine functions and spinal reflexes (6). In addition to providing care for the organ recipient, the nurse also provides care for the organ donor who is dependent on the level of knowledge and experience of the health care staff as well as the quality of the care provided.

Nurses are fully involved in the transplantation process from its beginning to the end, i.e. from preoperative patient preparation, assisting the surgeon during the transplantation process, to postoperative patient care. Once the procedure is completed, the nurse continues to monitor the patient's vital signs, administers pain relief drugs, monitors heartbeat and possible signs of organ rejection by the patient's body (7).

Organ donation is considered to be a social need that enables organ transplantation as a method of treatment. It signifies nobility and humanity reflected in a person's desire and intent to donate any part of one's body after death to help the severely ill. "A donor is a person who chose to donate one or several organs, be it while he/she is still alive or after death" (5). According to the Act on Human Organ Transplantation for Treatment Purposes (NN 144/12), body parts may only be used for transplantation if the deceased person had not written a statement against organ donation (5), or if his or her wish against donation had not been expressed to a family member. An organ or tissue from a living person can only be retrieved for the treatment of another patient when there is no matching organ or tissue from a deceased person or an equivalent treatment method (4). Human organs that can potentially be transplanted are kidney, pancreas, liver, lungs, heart or small intestine. Kidney transplantation enables a patient to discontinue dialysis, while pancreatic transplantation eliminates patient's need for insulin (8). Liver, lung, heart, and small intestine are transplanted to patients with endstage organ failure which endangers the patient's life. Tissue transplantation refers to the transplantation of skin, heart valve or blood vessel, cornea, bone and bone marrow (8).

The history of transplantation in Croatia began in 1971 when the first kidney transplantation was performed in Rijeka. Today, Croatia is known as one of the countries with the largest number of organ donors and transplants per million inhabitants (3). In 2007, Croatia has become a full member of the international organ exchange organization, Eurotransplant. Since then, the transplantation programme in the Republic of Croatia has been harmonized with the standards of the European Union and integrated into the European transplantation network. The Croatian Parliament adopted the act on retrieval and transplantation of human body parts for treatment purposes on December 3, 2004 (5). This act has established conditions for retrieval and transplantation of human body parts (organs and tissues) from a living or a deceased person for transplantation, for treatment purposes. The provisions of this act do not apply to reproduction organs and tissues, organs and tissues of an embryo or foetus, or blood and blood products.

The Croatian Donor Network (hereinafter referred to as HDM) began with its activities in Pula in 1998. The organization was created to inform the public about transplantations, post mortem donations and the need for organ retrieval for the purpose of successful treatment of seriously ill and terminal patients (4,9). Initially, the Croatian donor network promoted post mortem organ donation, but it has expanded its activities to date. The Council of the Croatian Donor Network was established in 2001 with the aim to become more persuasive and have more strength in its public activities. The HDM organization today has around one hundred collaborating associations, both in Croatia and across the world. Workshops and lectures in universities, secondary and primary schools, and similar institutions are held to promote their principles. The activities of HDM have been part of the Transplantation Programme of the Croatian Ministry of Health since 2011 (4,10).

Aim

The aim of this study was to examine and compare the opinions of the final year secondary health care students and the final year students of the undergraduate Nursing study programme about the importance of organ donation.

Hypothesis

There is no statistically significant difference in the participants' opinions about organ donation between the final year secondary health care students and the final year students of the undergraduate Nursing study programme.

Methods

The research was conducted in 2018, and the participants were 60 participants, 30 final year secondary health care students from Sisak and 30 final year students of the undergraduate Nursing study programme in Bjelovar.

The research instrument was a 13-item questionnaire designed for the purposes of the present study. The questionnaire consists of two parts, the first was used to elicit the participants' general data, while the second part contains questions about organ donation. Some items are dichotomous (yes or no), some have a third option (I do not know), while some are multiple choice items for which the participants could choose several of the provided answers.

Data Processing Methods

Participants' responses were entered into MS Excel. The data are presented in tables as absolute and relative frequencies. Furthermore, the correlation between the response and the degree of education was analysed and tested by the χ^2 test and the Fisher's test. Wilcoxon's test was used to test the equality of data distribution between secondary school and college students for the multiple choice questions with multiple responses. All these tests were made using the statistical programming language R, and for each test the level of significance was 0.05.

Results

The research was conducted among third year students of the undergraduate Nursing study programme at the Polytechnic in Bjelovar (N=30) and among health care students at the Viktorovac secondary school in Sisak (N=30). Two secondary school students' questionnaires were excluded from the analysis because they were incomplete. Questionnaires were correctly completed by 58 participants, of whom 44 were female and 14 were male. Figure 1 shows the ratio of female and male participants, and the binomial test confirmed significant differences in gender distribution (p<0.001).



Figure 1. Gender distribution of the participants

The data on participants' age are divided into three categories (18-25 years, 26-35 years, 36 and more), and the percentage of students in the 18-25 age group is the highest.



Figure 2. Age distribution of the participants

The distribution of the participants according to their religious beliefs, presented in Figure 3, shows that 51 participants (88%) declared themselves as believers (yes) and 7 (12%) as unbelievers (no).



Figure 3. The participants' distribution according to their religious beliefs

The descriptive analysis of the participants is followed by a comparison of the secondary school and college students' opinions and attitudes, which is the main objective of the statistical data processing. Table 1 shows the structure of the participants' responses pertaining to their willingness to donate organs, while Graph 1 presents age distribution of the participants' responses.

Table 1. The participants' willingness to donate organs according to their level of education				
	Secondary school students	College students	Total	
yes	21	21	42	
no	3	1	4	
l do not know	4	8	12	
Total	28	30	58	

The objective of applying statistical tests was to examine whether there was a difference in willingness to donate organs between secondary and college students, and, based on the results of the Fisher's exact test (p=0.356), it may be concluded that there is no difference according to the participants' education level.

The second item in the questionnaire was multiple choice item. There was a total of 123 responses and the most common reason for the participants' choice to donate their organs in both groups was the opportunity to save someone's life.

The results presented in the graph indicate that both groups have very similar attitudes. Using the Wilcoxon test, no statistically significant difference was found between the responses of the secondary and college students (W=1919.5, p=0.731).

The third item in the questionnaire inquired into the reasons why the participants would not want to be organ donors. A total of 60 responses were obtained, with almost 50% of the participants expressing the wish to be donors. The structure of the responses given by the secondary school and college students is shown below, and the Wilcoxon test confirmed that there is no sta-

tistically significant difference according to the participants' level of education (W=361.5, p=0.499).

The next item in the questionnaire is related to the secondary school and college students' willingness to donate the organs of their immediate family members after their death.

The Fisher's exact test showed no statistical difference in the attitudes between the two groups (p=0.207). Moreover, based on the results presented in Graph 4, it can be concluded that the differences are minimal.

Most participants reported that a person's identification card should state whether one is a donor or not. Table 2 shows that there are some differences in the participants' attitudes, but the Fisher's test confirms they are not significant (p=0.623).







Graph 2. Frequencies for the responses to the item "Choose the reasons why you would personally want to be an organ donor"

Table 2. Answers to the fifth question: "Do you consider that a person's ID should state whether he/she is an organ donor?"				
	Secondary school students	College students	Total	
yes	11	19	30	
no	13	10	23	
l do not know	4	1	5	
Total	28	30	58	

Most participants, N=29, of whom 14 college students and 15 secondary school students, believe that there is no need for financial compensation to the family donating an organ of a deceased person. On the other hand, 11 participants, 5 college students, and 6 secondary school students believe that the family of the deceased person should be financially compensated. The remaining 18 participants (11 college students and 7 secondary school students) did not express their opinion on this issue. The χ^2 test showed that the difference between the responses provided by college students and secondary school students is not statistically significant (χ^2 =0.946, p=0.623).

When the participants were asked about their attitudes about organ donation, almost all stated that they believe it to be a humane act (90% of college students and 86% of secondary school students).



Graph 3. Frequencies for the responses to the item "Choose the reasons why you would not personally want to be an organ donor"





Note: (1 - Humanity, nobility and solidarity, 2 - Religious reasons, 3 - I may also need a transplantation, 4 - I will save somebody's life, 5 - Me or someone from my family is on the waiting list, 6 - I do not want to be a donor, 7 - Other)



Graph 5. Absolute frequencies for the response to the seventh question: "What is your attitude towards organ donation?"

(1 - 1 think it is a humane act, 2 - 1 think that most organs end up in the "black market", 3 - 1 would never allow someone to take my organs, or those of my family and those close to me - 4 - 1 have no opinion about it, 5 - Other)

As many as 54 college and secondary school students believe that different forms of education, brochures, posters and similar aids may have an impact on raising awareness among the population about the importance of organ donation. In addition, the same number of participants believe that the media could also have an important role in raising awareness about the issue among the population.

The difference between the answers to the question whether the participants support the Croatian regulation which states that organs of any adult person who had not, during their lifetime, expressed in writing his/her opposition to being an organ donor can be retrieved without the consent of the family, was not statistically significant according to their level of education (χ^2 =0.662; p=0.718).

Participants' answers to the questions pertaining to the organ transplantation process including them or their family members as recipients were largely positive, i.e. 88% of the participants confirmed they would agree to organ transplantations in both cases.

The last question was related to whether it is necessary to have the information about the donor when receiving an organ during the transplantation process, and the χ^2 test showed no statistically significant difference in the opinions expressed by secondary school and college students (χ^2 =5.729, p=0.057).

Discussion

The aim of the research was to investigate whether the opinions about organ donation expressed by the final year secondary health care students differed from those of the final year students of the undergraduate Nursing study programme. Fisher's test showed no difference in their opinions, that is, both groups (>70% of participants) reported willingness to donate their organs after death. If the results of the present survey are compared to those of a study (11) conducted in 2016 among the employees of the Croatian Army forces in Karlovac, a similarity in attitudes is noticeable. The results showed that 69% of the members of the armed forces reported willingness to donate their organs, which is 3% less (in total) in comparison to the results of the present research.

Given the large percentage of participants willing to donate their organs, it was to be expected that most would also agree to donate organs of their family members after their death, but only ten college students responded positively while 18 were indecisive. The results were somewhat different among secondary health care students, as more than 50% reported willingness to donate organs of their family members, while 10 were indecisive. At the same time, if transplantation could save their or their family members' lives, over 88% of the participants reported they would agree to transplantation. The χ^2 test was applied to confirm if there is a statistically significant difference in the participants' opinions

about the importance of knowing who the organ donor is. Namely, 11 college students considered it important to know who the donor is while 8 considered it to be irrelevant (others were indecisive). In the case of secondary health care students, the situation is reversed, i.e. eight students considered it important to know who the donor is, while 15 of them considered it to be irrelevant (others were indecisive). The results of the test are surprising since, at the significance level of 0.05, it may be concluded that there is no statistically significant difference in the participants' responses. It is interesting that almost 50% of secondary health care students believed that a person's ID card should not contain the information that he/she is an organ donor, while the college students are of different opinion. As many as 19 of them thought this information should be stated. It was expected that there is a statistically significant difference between their opinions, but Fisher's test again showed no difference at the significance level of 0.05. Both groups of participants stated as the main reason why they would donate organs the fact that it might save someone's life (the most frequent response), and the second reason mentioned was humanity, nobility and solidarity. Considering that most of the participants would donate organs because they consider this to be an act of humanity, it is not surprising that most of them opposed provision of financial compensation to the families who donate the organs of their deceased family members. Given the positive attitudes about donating organs expressed by both groups of participants, it is surprising that 36 of them selected one of the reasons against donating while 23 responses confirmed they wanted to be donors (it was expected that this answer would be selected by a majority). This prompts the question of how much people actually know about the procedure and organizations involved in organ donation. The participants believe that various forms of education, brochures, posters and the like could contribute to the understanding of the importance of organ donation among the general population (as many as 54 out of 58 participants were of this opinion) and the same number of participants believed that the media could significantly influence the population's awareness about organ donation.

The Republic of Croatia is at the top of the European Union with regard to organ retrieval (10), and this is partly because of the way in which the law has been defined. Croatian regulation allows organ retrieval from an adult who had not, during his/her lifetime, declared in writing an opposition to being an organ donor, without the consent of his/her family. Another reason is equally valuable, as it indicates an increase in the number of donors due to a successful organizational model in the Republic of Croatia, primarily the network of transplantation coordinators, valuable work of devoted and enthusiastic health care workers, compliance with bioethical principles and public solidarity and awareness of the benefits of organ transplantation. Nevertheless, it would not have been possible without altruism and selfless help of families who, in the moments of their immense personal tragedy, agree to donate the organs of their loved ones. Despite the above-mentioned law, family decisions are always respected, that is, if the family does not give their consent, organs may not be retrieved. In the present survey, as many as 59% of the participants expressed their disagreement with the law while 19% agreed with it. The need for organs has been increasing every year and transplantation can provide patients with a better quality of life. All available tools should be used to ultimately motivate society members to join the donor network and thus increase the percentage of those willing to donate their organs after death.

Conclusion

Based on the conducted research and the obtained results it can be concluded that:

- the level of education does not affect a person's decision to donate organs,
- the participants' main motivation for deciding to donate organs is the possibility to rescue someone's life,
- organ donation is an act of humanity,
- several participants in the survey expressed negative opinions about organ donation. It is therefore recommended that workshops focusing on the importance of donating organs be organized in secondary health care schools with the objective to raise awareness about the importance of organ donation among health care workers.

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MIŠLJENJE UČENIKA ZAVRŠNE GODINE SREDNJE MEDICINSKE ŠKOLE I STUDENATA ZAVRŠNE GODINE PREDDIPLOMSKOG STUDIJA SESTRINSTVA O DONIRANJU ORGANA

Sažetak

Cilj. Ispitati i usporediti mišljenja učenika završne godine srednje medicinske škole i studenata završne godine preddiplomskog studija sestrinstva o važnosti doniranja organa.

Metode. Provedena je presječna studija na ukupno 60 ispitanika od kojih je 30 učenika srednje medicinske škole i 30 studenata preddiplomskog studija sestrinstva. U prikupljanju podataka primijenjen je upitnik izrađen za potrebe ovog istraživanja koji je sadržavao sljedeće skupine pitanja: u prvoj skupini pitanja o općim podacima ispitanika, a u drugoj skupini ni pitanja o tematici doniranja organa.

Rezultati. Dobivenim rezultatima utvrđeno je da ne postoji statistički značajna razlika kod donošenja odluke o doniranju organa ovisno o stupnju obrazovanja. Nadalje, rezultati su pokazali da i učenici završne godine srednje medicinske škole i studenti završne godine preddiplomskog studija sestrinstva žele donirati organe te im je glavna motivacija spašavanje nečijeg života, a dodatno većina ispitanika izražava stav da je takvo postupanje human čin.

Zaključak. Stupanj obrazovanja ne utječe na donošenje odluke o doniranju organa. Glavna je motivacija prilikom donošenja odluke o doniranju organa spašavanje nečijeg života. Doniranje organa je human čin. U istraživanju je nekoliko ispitanika izrazilo negativno mišljenje o doniranju organa. Stoga je preporuka da se u srednjim medicinskim školama i ostalim obrazovnim ustanovama za zdravstvene djelatnike organiziraju radionice koje imaju cilj budućim zdravstvenim djelatnicima ukazati na važnost doniranja organa.

Ključne riječi: doniranje organa, transplantacija organa, učenici srednje škole, studenti
Duration of Nursing Care in Patients with Hip Fractures

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Keywords: nursing care, hip fracture, nurse

Abstract

The research regarding the duration of nursing care in patients with hip fractures was conducted at the Traumatology and Orthopedic Institute of the University Hospital Dubrava in a period of 4 months. The research was conducted on 59 patients with a diagnosis of a broken hip, that have undergone surgery. The goal of this research was to determine the differences in the duration of nursing care due to age, gender, comorbidities and postoperative day. Statistical significance in all measurements was reduced to p<0.05. The research shows connection between patient age and the duration of nursing care. The presence of comorbidity also prolongs the duration of nursing care. Shorter duration of nursing care was determined in women compared to men in all age groups, but it wasn't of statistical significance.

Introduction

Hip fractures represent a serious physical injury that can have many complications and can increase the risk of mortality in elderly people. These types of fractures are common in elderly people, because, with ageing, the firmness, density and structure quality of the thigh bone deteriorate making it less resistant to trauma. It is because of the weakened bones, or osteoporosis and poor coordination, vision problems and different side effects from medication that elderly people are more prone to falling, and that is why hip fractures are most common above the age of 65 (1).

With the increase in the elderly population, longer life expectancy and greater traffic speed, the number of hip fracture incidents is increasing as well. The assessment is that by the year 2050 the number of hip fractures will go up to 6.26 million per year on a global scale. The frequency rate of hip fractures in Croatia is 4.7 per 1000 residents in the 65 and over age group (2).

Hip fracture mortality in the first year after the fracture is between 12 and 20% and there is almost no difference in countries with a very different degree of health standard (3).

Hip fractures in younger patients are most commonly caused by a strong direct force to the large trochanter, mainly by direct impact to the hip. In elderly people, a much weaker force is needed to cause a hip fracture, such as falling from a height or from an upright position. Hip fractures can be induced by pathological bone changes caused by tumours or metastases.

The fracture diagnosis is determined by taking the patient's history, and by physical examination. The type of fracture and indications for conservative treatment or surgery are determined by radiographic imaging (X-ray). If a fracture cannot be precisely determined by X-ray, and there is clinical doubt of its existence, it is necessary to perform a computerized tomography scan (CT).

Treatment methods depend on the type of fracture, patient age and vitality, comorbidities and life expectancy. Hip fractures are mainly treated surgically. Conservative treatments are intended for a small number of patients whose health condition is so bad that surgery is contraindicated by an anesthesiologist because the percentage of complications and early mortality are extremely high.

Surgical procedures for the treatment of fracture of the neck of the thorax include closed or open repositioning and internal fixation (cannulated bolts, dynamic neckline of the thigh bone, DHS, partial or total hip endoprosthesis) (4). All of the different treatment methods have one aim and that is to achieve the best possible functional result.

Today's stabilisation operational methods allow early mobilisation of adjacent joints, faster recovery to full mobility, and in some cases, the possibility of an even sooner physical exertion of the operated area. After the surgery, it is necessary to start the rehabilitation program as soon as possible. Every patient in the rehabilitation process has to have an individual approach that is adjusted to his or her needs and the type of surgical procedure performed. It is important to encourage the patients to exercise and get on their feet as soon as possible so that the risk of postoperative complications would be as low as possible. The goal of this research was to determine the differences in the duration of nursing care considering gender, age, comorbidities and postoperative day.

Methods

The research was carried out at the University Hospital Dubrava, Traumatology and Orthopedics Institute in the period from December 1st 2014 until March 31st 2015.

The research was conducted at the Traumatology Department on a sample of 59 patients who were diagnosed with hip fracture that had to be treated surgically. The research was conducted on 11 male and 48 female patients with an average age of 77 years and 2 months.

Upon patient arrival at the Traumatology and Orthopaedics Institute, a socio-demographic survey, made for the purpose of this research, was conducted (gender, age, comorbidities). The survey gathered information on a daily basis which gave an insight into nursing care processes. Oral consentwas given by the patients or a family member to conduct the survey. The collected data were linked to the date of surgery, type of operation and redone drainage, nursing care, therapy (application of infusion and transfusion, application of urinary catheter, application of splint and number of days of operative wound care) and complications. Data related to the duration of nursing care in postoperative days were obtained by inspecting the nursing documentation of the performed procedures in a way that sums up the duration of nursing care of all the procedures performed in minutes, through 24 hours.

STATISTICA 12.0, was used for statistical processing. Normality of distribution of continuous variables was verified by using the Shapiro-Wilks test, and homogeneity of variance by using the Levene test. The Ttest was used to determine the difference between the mean values of the variables between the two groups, and the variance analysis and the Newman-Keuls test were used to determine the difference between more than two groups. Before the above mentioned test were used, variables which deviated from the normal distribution were reduced to the same distribution by using a logarithm. Linear regression analysis was used to determine the possible correlation between postoperative time and duration of nursing care, and multiple regression analysis and general regression models were used to determine the influence of other predictor variables (sex, age, comorbidity). Statistical significance in all measurements was reduced to p < 0.05.

Results

Age of the patients ranges from 38 to 91 (77.2 \pm 11.4). Of the 59 respondents, 48 (81.4%) were women and 11 were men (18.6%).

The number of days required for recovery (Table 1) ranged from 0 to 19 (4.9 \pm 3.5) and the duration of nursing care from 0 to 120 minutes (75 \pm 19.2). If the duration of nursing care is grouped depending on the postoperative day (Table 2), it shows a decrease from zero (96.4 \pm 17.4) to the 11th day (51.8 \pm 14.9), after which there is a slight increase up to the 15th day. The variance analysis confirmed a statistically significant difference in the duration of nursing care between postoperative days (F=4.48; p=0.0006). The Newman-Keuls test confirmed that this difference was statistically significant between day zero and the 8th, 9th, 10th, 11th and 12th day, and between the first and the 10th, 11th and 12th day, while between the other days there were no statistically significant differences in the duration of nursing care.

The value of the Pearson correlation coefficient showed statistically significant, positive correlation (r=0.46) between the duration of nursing care in minutes and the age of the patient, showing when the age of the patient grows, duration of nursing care increase.

The value of the Pearson correlation coefficient showed a good statistically significant, negative correlation (r=-0.63) between the duration of nursing care and the postoperative day, indicating a significant reduction of the duration of nursing care with the increase of postoperative time.

The results of multiple regression analysis (Table 3) show that two predictors, of the four introduced, are statistically significant - the age and presence of comorbidity. All four predictors explain a total of 63% of the variance of the duration of nursing care. It is longer for the patients who are older and have comorbidities, age has a greater influence on the duration of nursing care.

	Table 1. Duration of nursing care expressed in minutes and number of postoperative days depending on the patient										
Postoperative day				Duration of nursing care							
Ν	x	SD	Minimum	Maximum	x	SD	Minimum	Maximum			
59	4.9	3.5	0	19	75.0	19.2	0	120			
		standard de	vistion N sumber of pati	opto							

Table 2. Duration	of nursing care (ex	pressed in minutes) d	lepending on the po	stoperative day
		Statistical p	parameter	
Postoperative day	x	SD	Minimum	Maximum
0	96.4	17.4	0	120
1	91.5	16.8	0	120
2	85.9	15.9	0	110
3	83.3	12.2	45	120
4	77.1	13.1	35	120
5	73.1	12.1	50	110
6	67.7	12.9	40	100
7	63.9	11.9	35	90
8	60.4	11.1	40	80
9	57.4	12.5	30	75
10	54.5	14.0	30	70
11	51.8	14.9	30	70
12	54.4	19.9	30	90
13	58.3	21.4	30	90
14	63.8	22.9	35	90
15	80.0	14.1	70	90
16	70.0	0.0	70	70
17	70.0	0.0	70	70
18	70.0	0.0	70	70
19	70.0	0.0	70	70
All	75.0	19.2	0	120

Table 3. Results of multiple regression analysis
of dependence of time duration on predictor
variables. β -beta coefficients of the individual
contribution of variables to total correlation;
R2 coefficient determinations; p-statistical
significance; *Statistically significant at
p < 0.05 β pPostoperative day-0.210.062922Arro0.580.000018*

Age	0.58	0.000018*		
Gender	0.16	0.185247		
Comorbidities	-0.28	0.016461*		
	R ² =0.63;	×0.0001* R ² =0.63		

Similar results were obtained with the general regression model showed in the Pareto diagram (Picture 1), where it is shown that the age and the comorbidities are significantly associated with the duration of nursing care.



Figure 1. The results of a multiple regression model expressed in the form of Pareto Diagram of dependence of duration of nursing care on predictor variables

Table 4. Basic statistical parameters and t-test results for the duration of nursing care with regard to gender of respondents										
	N _w	N _M	$X_w \pm SD_w$	X _M ± SD _M	t	р				
Duration of care (min.)	48	11	75.76±10.2	74.54±16.1	0.31	0.7524				

Table 5. Mean values (x) and standard deviations (SD) for the duration of nursing care depending on the presence/absence of comorbidity

Comorbidition	NI	Duration of nursing care		
comorbidities	N	x	SD	
YES	44	77.3	11.3	
NO	14	70.2	10.7	
All	58	75.6	11.5	

It can be seen (Table 4) from the results that there are no statistically significant differences in the duration of care considering to the gender of respondents.

Table 6. Results of the t-test for duration of nursing care depending on the presence/ absence of comorbidity						
Variable	t	p				
Duration of care	-2.1	0.0415*				

From Table 5 it is apparent that those with comorbidities require longer treatment time (77.3 \pm 11.3) than those with no comorbidity (70.2 \pm 10.7). T-test (Table 6) confirmed that the difference was statistically significant (p=0.0415).

Discussion

Today's modern lifestyle and the increased ageing of the population cause common chronic diseases. Most of the patients above 65 years of age have one or more somatic diseases. Such associated diseases have a big impact on the nursing care process: they require more time and effort, knowledge, experience and proficiency.

One or more comorbidities are present in 44 patients (76.3%) covered by this study. Among the comorbidities, cardiovascular disease is present in 39 (66.1%)

patients, which is expected because of the greater age of the patient. Arterial hypertension is present in 28 (47.5%) patients.

Among other comorbidities, diabetes is present in 17 (28.8%) patients and other comorbidities are present in 23 (39%) patients. Respiratory diseases and alcoholism are present in three patients, and nephrologic and malignant diseases in five patients.

In a similar research, Vukamanović et al. state that almost 80% of patients have had associated diseases, and the most common were cardiovascular diseases, neurological diseases and diabetes mellitus, as is the case in this research. In their research, most of the rehabilitated patients (81) had associated diseases, and only 22 of them did not have any comorbidities. A large number of patients had a comorbidity, almost 80% (CV, neurological, endocrinological) (5).

Somewhat different results are described in the paper by Grubor et al. Long-term diseases were noticed in 51 (50%) patients on admission. The most common were high blood pressure and heart problems in 39 (38%) patients, diabetes mellitus in 7 (6%) patients, renal insufficiency in 2 (1.9%) patients, and osteoporosis in 51(50%) patient (6).

The results of this research have shown that the duration of nursing care has significant interindividual differences. Generally speaking, it decreases with the increase of postoperative time, and increases with the age of both sexes.

Similar research regarding duration of nursing care in patients with hip fractures were not carried out so

the results could not have been compared. However, these results are expected. It can be assumed that younger patients will recover more quickly in relation to the elderly, they will be better at following instructions related to performing nursing care procedures, and will be able to perform more self-care activities without the assistance of nurses.

This research has some limitations that are related to the research plan, such as the absence of a control group that would enable verification of the obtained results. Another limitation is the fact that the data was collected throughout the whole day which means that it was collected by different people, and that could have led to mistakes while entering data.

Even though this research was conducted over a period of 4 months and the sample size was relatively large (59 patients), it is possible that a full year of research would result in more meaningful data.

Conclusion

The results of the research have shown that the duration of nursing care has significant interindividual differences.

Generally speaking, it decreases with the increase in postoperative time, and increases with the age of both sexes. The age of the patient has the greatest contribution to the duration of nursing care. The presence of comorbidity also prolongs the duration of nursing care.

A somewhat shorter duration of nursing care was found in women compared to men in all age groups, but differences were not statistically significant.

Even though the workload of nurses at the Traumatology Department was not the focus of this research, the results speak for themselves, and it is possible to determine the scope of work and the number of nurses needed to perform nursing care procedures based on the number of patients.

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DULJINA TRAJANJA ZDRAVSTVENE NJEGE KOD BOLESNIKA S PRIJELOMOM KUKA

Sažetak

Istraživanje o duljini trajanja zdravstvene njege kod bolesnika s prijelomom kuka provedeno je na Zavodu za traumatologiju i ortopediju Kliničke bolnice Dubrava u razdoblju od četiri mjeseca. Uzorak ovog istraživanja činilo je 59 bolesnika s dijagnozom prijeloma kuka u kojih je učinjen kirurški zahvat. Cilj istraživanja bio je utvrditi razlike u duljini trajanja zdravstvene njege kod bolesnika s prijelomom kuka s obzirom na dob, spol, komorbiditete i poslijeoperacijski dan. Statistička značajnost u svim mjerenjima svedena je na p < 0,05.

Rezultati istraživanja pokazali su da vrijeme trajanja njege pokazuje značajne interindividualne razlike. Generalno gledano smanjuje se s porastom poslijeoperacijskog vremena, a povećava s dobi pacijenata kod oba spola. Dob pacijenta ima najveći utjecaj na vrijeme trajanja njege. Prisutnost komorbiditeta također produžuje vrijeme trajanja njege. Nešto niže vrijeme trajanja njege je utvrđeno kod žena u odnosu na muškarce u svim dobnim skupinama, ali te razlike nisu bile i statistički značajne.

Ključne riječi: zdravstvena njega, prijelom kuka, medicinska sestra

The Attitudes of Nurses Towards Internship in the Republic of Croatia

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Abstract

The internship in health care is regulated by the Rules and Regulations on Internship of Health Care Providers. One of the measures of the Croatian Institute for promoting employment of interns in health care is "Professional Training for Work Without Establishing an Employment Relationship".

The aim of this research is to determine the attitudes towards internship and to determine whether there is a statistically significant difference between the attitudes of currently employed nurses and those currently doing an internship.

The research was conducted through the Internet, using an anonymous questionnaire containing 10 questions, out of which 8 were closed-ended and 2 open-ended questions. A total of 306 respondents were interviewed, of whom 232 were nurses and 49 nursing interns. When asked whether internship is necessary in health care, 98.4% of the respondents answered positively, with the majority of interns (75.3%) considering that there is a need for changes in internship. The results of the chi-square test suggest that there are statistically significant differences in the attitudes of employed respondents and interns in the answers to 5 questions. The interns rated their knowledge of internship worse than healthcare workers and workers in other systems. Interns associate internship with exploitation, while employed nurses mention that it reminds them of training for independent work. Most healthcare professionals would like someone close to them to have the right/obligation to do internship.

By analyzing the results of the attitudes towards internship, a statistically significant difference between currently employed nurses and nursing interns was established. It is felt that youth training should be the responsibility of the employers who should provide adequate education and continuous monitoring of new workers.

Introduction

One of the current topics related to recently graduated bachelors of nursing is the discontinuation of internship. So far, every bachelor in health care has had the legal right, but also the obligation, to complete a one-year internship, and after completing the internship, pass a state exam. When Croatia joined the European Union, the obligation to do internships was discontinued for students enrolled in a nursing study programme after 1 July 2013, so that students can, upon graduation, directly compete in the labor market as licensed health professionals.

Education of nurses in the Republic of Croatia

Until the school year 2010/2011, secondary school education of nurses in Croatia lasted 4 years, during which students were taught both general and professional subjects. After finishing secondary school, nurses were required to complete a one-year internship to become licenced nurses and be able to compete in the labor market. The harmonization with the requirements of the European Union and the Directive 2005/36 started in the year 2010/2011. The Directive stipulates the minimum required number of 4600 hours of training for the education of nurses. Education is carried out at all levels of health care.

From the school year 2010/2011 the education has lasted 5 years, according to the principle 2 + 3 (two years of general education and 3 years exclusively for professional subjects). After completing secondary education, the title nurse with a direct enrollment in the Register of the Croatian Nursing Council is obtained without the obligation to do internship and take a state exam.

For the enrollment into the undergraduate study of nursing, the European Union Directives require a twelve-year general education and recommendation for the enrollment of students who are 18 or at least 17 years of age. Directive 2005/36/EC details the minimum requirements for the education of nurses, which stipulate that: education should last at least three years or 4600 hours of theoretical and clinical training, theoretical classes should take up one third of the total duration of the study program and clinical practice should take up one half of the total duration of the study program. The Directive also prescribes the mandatory contents of the education program for nurses (1).

After thematic evaluation in 2013, upon the request of the Ministry of Science and Sport, in 2014 a study program of Nursing was created, the so-called *Core curriculum*. This is a compulsory part of the nursing studies, unique for the whole of Croatia. The compulsory part bears 158 of the total of 180 ECTS credits. The other 22 credits refer to elective courses that higher education institutions can choose for themselves. Therefore, from the academic year 2015/2016, at all undergraduate nursing studies in the Republic of Croatia, the compulsory courses follow an identical program (2).

Upon completion of the undergraduate study of nursing, students may continue their studies at specialist graduate professional studies or university graduate studies in the Republic of Croatia. Specialist graduate professional studies last two years, bear 120 ECTS credits and award a title of a graduate nurse. Nursing specialist graduate professional studies are held at the University of Applied Health Sciences in Zagreb and the University of Dubrovnik study programe of Nursing. University graduate nursing studies also last for two years and bear 120 ECTS credits. The total number of credits obtained by completing undergraduate and graduate studies is at least 300 ECTS credits. By completing the undergraduate and graduate university studies, the academic title of Master of Nursing is acquired.

After completing graduate university studies, there is a possibility of further education in related postgraduate studies. Postgraduate university study usually lasts three years. Upon completion of postgraduate studies a student acquires the academic title of a Doctor of Science. Universities can organize postgraduate specialist studies that last one to two years and award the academic title of a university specialist of the respective profession (3). One such study program is organized by the Libertas International University in Zagreb, which offers a university postgraduate study of Quality Management in Healthcare, which awards the academic title of the Master of Quality Management in Healthcare.

As in European countries and the United States, the education of nurses in the Republic of Croatia is continually raised to a higher academic level. Nurses have been gradually receiving the possibility of university-level education and the possibility to obtain a university degree. Today, students at the university graduate study of nursing have completed their graduate studies ten to thirty years ago and have a long-term working experience in health care (4).

After completing the education at the bachelor or graduate level the need for education and further professional development does not stop. Nurses are required to continually renew their existing knowledge and acquire new ones in order to ensure safe and quality care. The continual development of medical, as well as nursing sciences, requires lifelong learning. Obligatory continuous training is required in Croatia for the purpose of renewing licences for independent work (2).

In the contemporary world, employers confirm that the knowledge that pupils are generally acquiring is not adequate. Graduates receive too much general and not enough practical knowledge, therefore, additional courses and other educational programs need to be organized in order for graduates to acquire appropriate practical knowledge (5).

Nursing internship

Nursing internship in the Republic of Croatia, as well as its requirements and implementation, have changed over history. In 2011, the Rules and Regulations on Internship of Health Care Providers came into force.

According to the Rules, internship is a supervised work whereby a health worker is trained for independent work. It is carried out according to a set program, which determines the schedule and duration of work at certain professional units, as well as professional activities which prepare a person for independent work (6).

Although internship has been discontinued for students who enrolled in the nursing studies after July 1, 2013, the Rules are still in force for students who have enrolled in the nursing study before that date. The reason for this is that the study until then was not harmonized with the European Directive 2005/36/EC, which stipulates the number of hours required for bachelors of nursing, without the need for doing an internship.

The Croatian Employment Service has issued various types of measures and support for education, train-

ing and employment. One of them is professional training for work without establishing a working relationship (7).

This type of training is used for nursing internship. It lasts 12 months, the requirements are the proper fulfillment of obligations and obtaining signatures of the heads of departments as well as head nurses of the required departments and clinics, where interns must work during their internship. At the primary health care level, the intern does his or her internship in family medicine, pediatrics, and community nursing - where he has the opportunity to participate in the education of the population under the supervision of a community nurse. However, most of their internship is done in a hospital at different departments. The intern goes through surgery departments such as abdominal, vascular, thoracic and traumatology department. He also visits internal medicine departments such as gastroenterology, nephrology and cardiology departments - depending on the employer's options. Among others, there is also a clinic for infectious diseases, department for neurology, psychiatry and gynecology. The employer ensures that the intern works at all the required departments in the health institution. If the institution does not have all the departments, the intern is sent to another healthcare institution as agreed with that institution.

An intern receives financial compensation which is currently 2751 kn, as well as the reimbursment of the costs of state examination. Formerly, financial compensation depended on the choice of the employer, and in some cases it was not received, and sometimes it amounted to 75% of the salary for that job. When introducing the measure of internship, the compensation was set at 1600 kn, then it amounted to 2400 kn, 2620 kn, and in 2018 - 2751 kn.

Upon completion of the internship, the intern is required to pass a state exam in order to get a licence for independent work necessary for employment. The content of the state exam is defined by the Rules and Regulations on Internship of Health Care Providers. For nurses the exam consists of two parts; general and professional. The general section covers the Constitutional Order of the Republic of Croatia, the Healthcare Act, Act on Mandatory Health Insurance, and the Labor and Pension Insurance Act. The professional part of the exam comprises questions related to the nursing care of patients and nursing care in primary health care (5). There is another employment measure that can be used to hire nurses, and it is called Support for Employment for Gaining First Working Experience/ Internship (8). This measure can be used by unemployed persons without any working experience in the profession. It lasts for 12 months, and the financial compensation amounts to 100% of the amount of the intern salary, which is 85% of the salary for that workplace, and in accordance with the Regulation on job titles and complexity coefficients in the civil service and the cost of transport in accordance with the Decision of the Management Board.

During internship, each intern has a mentor who should have a relevant occupation, level of education, or work experience (at least three years of work experience in the jobs that the intern will be doing) and have an elaborated program of the internship. If the mentor does not have the suitable occupation and level of education, the employer authenticates the experience of the mentor by providing a document from the Croatian Pension Insurance Institute or the employment contract.

Aim

The aim of the research is to determine the attitudes of nurses towards internship and to determine whether there is a statistically significant difference between the attitudes of currently employed nurses and those currently doing internship.

Methods

The research was conducted using surveys which were collected and analysed using the web portal Google Forms. There was a total of 10 questions out of which 8 were multiple choice questions and 2 were open-ended questions.

The study lasted for 16 days (28 May 2018 – 12 June 2018). Respondents filled out the surveys anonymously. The first question differentiates between the respondents, as it make a difference between the employed nurses, nurse interns and non-healthcare workers. The statistically significant difference between the respondents was determined by the chisquare test, with the significance level set at p<0.05.

A total of 306 respondents answered the survey which was available in the digital form and published on social networking sites by nursing interns and nurses.

The research was done as part of the final paper at the University of Applied Health Sciences in Zagreb, with the approval of the Ethics Committee of the Clinical Hospital Merkur. The results obtained from the multiple choice questions are shown in numbers and percentages.

Results

The majority of the respondents are healthcare professionals, i.e. nurses (232, 75.8%), while there is a smaller number of nursing interns (49, 16%) and non-healthcare workers (25, 8.2%).

Half of the respondents (154, 50.3%) think that their knowledge of the internship system is excellent, while 99 (32.4%) consider their knowledge as very good, 44 (14.4%) as sufficient, and 9 (2.9%) as poor.

In Table 1 it can be seen that there is a statistically significant difference in the knowledge of the internship system with regard to the workplace of the respondents, where the interns rated their knowledge as poorer. In the analysis of this and other chi-



Graph 1. Status of respondents in the healthcare system



Graph 2. Question 2: "What is your knowledge of the internship system?"

squares, non-healthcare workers were not included, so that the statistical strength of the chi-squares is higher, also taking into consideration that the aim of the research is to determine whether there are differences between healthcare professionals and those doing an internship in health care.

152 respondents, or 49.7%, associate internship with training for independent work. 79 respondents, or 25.8%, associate it with settling into the work process, while 73, or 23.9% of the respondents, consider it to be exploitation, and 2 of them, or 0.7%, consider it to be something else.

Table 2 shows that there is a statistically significant difference in the association that the research participants have with regard to the internship, and taking into consideration their workplace. Nursing interns mostly associate internships with exploitation (42.9%), while healthcare workers (55.7%) usually associate internship with training for independent work. In order to increase the statistical strength of the chisquare test, the answer "Other" chosen by only two participants (0.7%) was exempt from the analysis.

Of the total number of respondents (156), 51% think that internship is definitely needed in health care, 145 of them (47.4%) think it is needed, however, with certain changes introduced, and 5 of them (1.6%) think that internship is not needed.

Furthermore, there is a statistically significant difference between the groups of respondents as to whether internship in health care is needed, with the

Table 1. Chi-square test of the differences between the groups in the answer to the question "What is your knowledge of the internship system?"										
What is your knowledge of the internship system?										
			Excellent	Very good	Sufficient	Poor	Total			
	Employed in health care	Frequency	124	68	35	5	232			
YOUR STATUS IN		Percentage	53.4%	29.3%	15.1%	2.2%	100%			
system:	Healthcare	Frequency	16	23	6	4	49			
	intern	Percentage	32.7%	46.9%	12.2%	8.2%	100%			
	Total	Frequency	140	91	41	9	281			
	TOLAI	Percentage	49.8%	32.4%	14.4%	3.2%	100%			
Chi-square=12.177; df=3; p	hi-square=12.177; df=3; p<0.01									

Table 2. Chi-square test of the differences between the groups in the answer to the question "What is your association when you find out that someone is doing an internship?"

			What is your association when you find out that someone is doing an internship?				
			Settling into the work process	Exploitation	Training for independent work	Total	
	Employed in	Frequency	60	42	128	230	
Your status in the	health care Healthcare	Percentage	26.1%	18.3%	55.7%	100%	
healthcare system:		Frequency	16	21	12	49	
	intern	Percentage	32.7%	42.9%	24.5%	100%	
	Total	Frequency	76	63	140	279	
	Iotal	Percentage	27.2%	22.6%	50.2%	100%	

Chi-square =19.279; df=2; *p*<0.01



Graph 3. Question 3. "What is your association when you find out that someone is doing an

majority of healthcare workers (59.9%) considering it to be needed while the percentage of nursing interns with the same attitude is much smaller (22.4%), and most of respondents (73.5%) believe that internship is needed but with certain changes introduced. With regards to the current compensation for work, 230 respondents (75%) consider the compensation insufficient; it is considered as sufficient by 75 (24.5%) respondents, and 1 respondent (0.3%) considers is to be too high.



Graph 4. Question 4: "Do you think that internship is necessary in health care?"



Graph 5. Question 5:

"What is your opinion about the current financial compensation for internship? (2751 kn/month)"

Table 3. Chi-squ	iare test of th "Do you thi	e differences ink that inter	s between the nship is nece	e groups in the a ssary in health (nswer to the que care?"	stion	
		Do you think that internship is necessary in health care?					
			Definitely yes	Definitely not	Yes, with some changes	Total	
	Employed in	Frequency	139	2	91	232	
Your status in the	health care	Percentage	59.9%	0.9%	39.2%	100%	
healthcare system:	Healthcare	Frequency	11	2	36	49	
	intern	Percentage	22.4%	4.1%	73.5%	100%	
	Tatal	Frequency	150	4	127	281	
	Iotal	Percentage	53.4%	1.4%	45.2%	100%	
Chi-square=24.081 · df=2· o< 0	01						

Table 4. Chi-square test of the differences between the groups in the answer to the question "What is your opinion about the current financial compensation for internship? (2751 kn/month)"									
			What is your opinio financial compensa (2751 km	Total					
			Sufficient	Insufficient					
	Employed in in the health care	Frequency	68	163	231				
Your status in the		Percentage	29.4%	70.6%	100%				
healthcare system:	Healthcare	Frequency	6	43	49				
	intern	Percentage	12.2%	87.8%	100%				
	Total	Frequency	74	206	280				
	TOLA	Percentage	26.4%	73.6%	100%				
Chi coupro = $E 1/E_1 df = 1/e_2 0.0$									

Even though most respondents in both groups believe that the current compensation for internship is insufficient, there is still a statistically significant difference in their ratio, with 87.8% of interns considering this compensation to be insufficient, while for healthcare workers that ratio is lower (70.6%, Table 4). In order to increase the statistical strength of the chi-square test, the answer "Too high" given by only 1 respondent (0.3%) was exempted from the analysis.

When asked if internship should be included in the years of employment, 289 (94.4%) of respondents believe it should be fully included. A smaller number of respondents (14, 4.6%) thinks it is necessary to be included but a year of internship should stand for half a year of employment, while 3 (1%) consider that internship does not need to be included.

Table 5 shows that there is no statistically significant difference between the groups considering whether

internship should be included in the years of service; most of the participants in both groups (93.8 and 95.7%) believe that it should count as one year of employment. In order to increase the statistical strength of the chi-square test, the answer "No, it does not count as work" was exempted from the analysis since it was chosen by only three participants (1%).

For responsibility for mistakes, of the total number of respondents, 177 (57.8%) consider that mentors and interns should share the responsibility. 113 respondents (36.9%) think that mentors should take full responsibility, while 16 respondents (5.2%) believe that interns are entirely responsible.

Table 6 shows that there is no statistically significant difference in the opinion of whether interns should be held responsible for the mistakes they make, with the majority of both groups considering that the responsibility should be divided between the mentor



Graph 6. Question 6: "Do you feel that internship should be included in the years of service?"

Table 5. Chi-square test of the differences between the groups in the answer to the question "Do you feel that internship should be included in the years of service?"									
			Do you feel that int included in the y	ernship should be ears of service?					
			Yes, it is one year of employment	Yes, but a year of internship as 6 months of employment	Total				
Your status in the	Employed in health care	Frequency Percentage	220 95.7%	10 4.3%	230 100%				
healthcare system:	Healthcare intern	Frequency Percentage	45 93.8%	3 6.3%	48 100%				
		Total Percentage	265 95.3%	13 4.7%	278 100%				

Chi-square=0.322; df=1; p>0.05

Table 6. Chi-square test of the differences between the groups in the answer to the question "Should interns be responsible for mistakes they make in their work?"

		Should interns be responsible for mistakes they make in their work?					
			No, they are the responsibility of their mentor and they do not work independently	Partially, mentor and the intern should share the responsibility	Interns should bear the same responsibility as employed persons	Total	
Manual tata in	Employed in	Frequency	90	129	13	232	
Your status in	health care	Percentage	38.8%	55.6%	5.6%	100%	
system.	Healthcare	Frequency	15	32	2	49	
System.	intern	Percentage	30.6%	65.3%	4.1%	100%	
		Total	105	161	15	281	
		Percentage	37.4%	57.3%	5.3%	100%	
Chi caupro =1 E6E: df=2: o	NO 0E						



Graph 7. Question 7: "Should interns be responsible for mistakes they make in their work?"





and the intern equally (55.6% and 65.3%). Only a small share of the participants believes that interns should bear the same responsibility as persons who are employed (4.1% to 5.6%).

Out of the total number of respondents, 265 (86.2%) believe that internship is a positive and useful experience, 14 respondents (4.7%) consider it to be negative and unprofitable. 27 respondents (9.1%) answered "Other".

There is no statistically significant difference in the ratio of responses to a question about whether they

would want a person they care about have the obligation of doing an internship (Table 7). In order to increase the statistical strength of the chi-square test, the answer "Other" chosen by 27 participants (8.8%) was exempt from the analysis, and it did not give any additional information on the attitudes of the participants.

Question 9: "What do you think the person should learn during internship? Write 3 things ranked by order of importance. Example: responsibility, independence, work skills"

Table 7. Chi-square test of the differences between the groups in the answer to the question "Would you want a person you care about have the obligation of doing an internship?"					
			Would you want a person you care about have the right/obligation of doing an internship?		Total
			Yes, I see this as a positive and useful experience	No, I see it as negative and unprofitable	IUtai
Your status in the healthcare system:	Employed in	Frequency	209	7	216
	health care	Percentage	96.8%	3.2%	100%
	Healthcare	Frequency	39	4	43
	intern	Percentage	90.7%	9.3%	100%
		Total	248	11	259
		Percentage	95.8%	4.2%	100%

There are 257 responses in total. We singled out the most common and the special ones:

- Work skills, responsibility, independence (11)
- Work skills, independence, responsibility (11)
- Responsibility, work skills, independence (9)
- Responsibility, independence, work skills (4)
- Independence, work skills, responsibility (3)
- Independence, responsibility, work skills (2)
- Independence, work skills, communication
- Work skills, patient relationship, responsibility
- Independence, teamwork, responsibility towards work, organization
- Work skills, managing work tasks, applying theory to practice
- Code and rules of behavior towards employees and patients, teamwork, dealing with limited time and resources, dealing professionally with all members of the health team, patients and family
- Applying intravenous and intramuscular therapy, inserting urinary catheter and venous cannulation

The most important things an intern needs to learn were already provided as answers and those were, e.g., work skills, responsibility, and independence. Of the other answers, there are various statements concerning nursing practice such as: teamwork, patient relationship, specific skills such as drawing blood, inserting urinary catheter and nasogastric intubation, work habits, empathy, code and rules of behaviour, time management and management of other resources etc.

Question 10: A brief comment of the topic, your attitude, explanation, suggestion for changes: (Not required)

There are 94 answers in total, of which 87 are positive towards the internship, while 7 are negative. Some answers are singled out.

- 1. "I consider discontinuing a one-year internship a major degradation of a nursing profession, something that could ruin the whole concept and reputation of the profession."
- "90% of today's youth (from my own experience) think that they have all the knowledge after finishing their education, but it turns out that this is not true and that they really need that one year to settle into their job, to gain work habits and responsibility."

- 3. "My opinion is that it is absurd that there is no internship because, unfortunately, while in the school, you do not get so much knowledge and skills. During internship you are thrown into work, so you need to manage in different situations and that's the only way to learn how to do the job."
- 4. "I think that practical training you have during education is simply not enough, especially for people who have enrolled into a higher level of education in a profession that is not healthoriented."
- 5. "In health care, firstly,our school education is not adequately arranged, you learn one thing at school/university, and at work you do something else. During internship, you lose one year of your life providing nursing care instead of nurses who are employed at those departments and you do not want to be impolite, there are a few honorable exceptions, but all in all, internship does not serve its purpose."
- 6. "The intern does not know, he or she has no experience (especially if he was a secondary school student), and all the work and great stress falls on the nurse in whose shift the intern works. This is by no means all right and eventually the patients suffer because of it."
- 7. "Personally, I think that internship is a desirable and definitely important experience because there is no better way to introduce a young person into the work of healthcare workers."
- 8. "Internship serves the interns to gain responsibility and to understand the weight of their actions as well as their responsibilities. The mentor can speak and teach and show, but without their desire, knowledge and responsibility towards the job, there are no results."
- 9. "I think internship is a great thing that any person who has chosen a healthcare profession should go through. Personally, this was a wonderful year which I would like to repeat. Before internship not much is known."

Discussion

Knowledge, responsibility and skills are often mentioned in this research. In an Indian town Chennai, there was a study of the attitudes of students in their last year of undergraduate study towards nursing internship. A total of 43 students participated in the research and 96% stated that during internship they have to strengthen 3 aspects: knowledge, skills and attitudes (9). The research carried out in the Republic of Croatia mentions knowledge, skills and responsibility, while in the research in Turkey, knowledge, skills and attitudes are pointed out. The difference is that in the research in Croatia, instead of attitude, responsibility is mentioned. Despite this difference, the results of that research do not contradict the results obtained in this research, which only strengthens the credibility of the attitudes towards internship of a larger number of people. Strengthening the competences needed for independent work with a mentor is of great importance as stressed in many answers to open-ended questions in this research. It is also important to point out that the role of the educator/mentor is significant. While there is officially no mentor for employee training, in the case of internship there is a clearly defined person for an individual intern. A study was conducted in Saudi Arabia with the aim of investigating how much new nurses learn while working with a mentor/ supervisor. They call it "preceptorship" and it is similar to internship. The study included 92 nurse interns who completed a five-year nursing study. The influence of supervised work on strengthening clinical competences required for independent work was investigated. The results have shown that interns have improved their competences primarily in prioritizing care for acute patients, multitasking, and complex nursing skills. Most of the interns considered working with a mentor a very useful experience. It was concluded that interns significantly strengthen the competences needed for independent work while supervised by mentors in charge of education at work (10). The conclusion was that nurses in Saudi Arabia learn a lot of skills important for independent work during supervised work, which could be identified with nursing internship in the Republic of Croatia. Another such study was conducted at Karlovac General Hospital, and it demonstrates the importance of mentors in the training of young nurses. The purpose was to describe the results of the evaluation in order to obtain answers as to how could teachers/mentors themselves improve daily work activities and consequently find new models, methods and strategies for improving the quality of education (11). The importance of mentoring has been re-established, even though it was only the case of clinical practice, and the same was also established for internship. Similar research was also conducted at Clinical Hospital Centre Zagreb. The aim of the research was to examine the mentoring styles in the professional training of nursing bachelors and to establish the connection between the mentoring style and the mentor's qualifications, place of work, years of work experience and study year during which he mentors at a health institution. There was a significant difference with regard to the mentor's professional qualification and place of work. Mentors with undergraduate education act more as counsellors and have a higher level of cooperation with the interns than mentors with graduate degrees. Furthermore, mentors working in hospital departments and primary health care have a higher level of cooperation than mentors in intensive care (12). It was concluded that further research in the field of mentoring and nursing supervision is required.

In the answers to the 10th question of this research, there is often dissatisfaction with the exploitation of interns for doing "less significant" jobs, and a burnout syndrome after a certain time may be noticed. The research in Turkey has shown how internship affects work dedication and burnout syndrome later in work. The study was conducted on 101 students, and it included surveys for students of the final years. The research showed general satisfaction with their job, increased dedication towards work after internship, but also a rise in the burnout syndrome during lengthy exposure of interns to less important jobs (13). The results confirm the importance of internship for later progress and skills development as in the results of this research. These results can be supported by a similar research carried out in Ireland. Midwives' attitudes during internship were investigated. Although this is a different health profession, the results also include the importance of internship in consolidating clinical skills, building trust and competencies relevant for midwifery practice (14). Not everything depends on the importance of mentoring. In order to facilitate the transition from the role of a

student to the role of a nurse, the cooperation of the educational and health system is necessary (15).

Even though the research of the attitudes of nurses towards the discontinuation of internship has not yet been conducted in the Republic of Croatia, there is a lot of similar research on the attitudes of nursing interns throughout the world. The fact is that most of the research is closely related to work under supervision and mentoring. Respondents are largely in agreement that internship, or its alternative, is definitely needed in nursing.

Conclusion

The attitudes of nurses towards internship have been determined in this research. From the results, it is very clear that most respondents consider internship necessary in healthcare. Respondents agree that internship, or its alternative, is necessary for nursing and its discontinuation will not contribute to the progress of the nursing profession. There were statistically significant differences between employee and interns' attitudes towards this issue. Interns rate their knowledge of internship poorer than employed nurses, and have different associations and attitudes.

The results clearly show the disadvantages of internship; misapplication, poor financial compensation, exploitation, insufficient training of the interns, and the like. Although internship has been discontinued, it is necessary to state that 98.6% of the respondents consider that internship is necessary in health care.

The research states the unquestionable importance of quality mentoring, therefore, employers should be responsible for securing nurse educators who would educate young nurses about the basics, but also the specifics of the job. In such a way, sufficient attention to new workers and also new jobs for nurse educators would be provided.

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STAVOVI MEDICINSKIH SESTARA/TEHNIČARA O PRIPRAVNIČKOM STAŽU U REPUBLICI HRVATSKOJ

Sažetak

Pripravnički staž u zdravstvu je reguliran Pravilnikom o pripravničkom stažu zdravstvenih radnika. Jedna je od mjera Hrvatskog zavoda za poticanje zapošljavanja pripravnika u zdravstvu "stručno osposobljavanje za rad bez zasnivanja radnog odnosa".

Cilj je ovog istraživanja istražiti stavove o pripravničkom stažu te utvrditi postoji li statistički značajna razlika u stavovima trenutačno zaposlenih medicinskih sestara/tehničara te onih koji trenutačno obavljaju pripravnički staž.

Istraživanje se provodilo putem interneta, anonimnim anketama s 10 pitanja, od toga osam pitanja s ponuđenim odgovorima te dva pitanja otvorenog tipa. Ukupno se odazvalo 306 ispitanika, od toga su 232 medicinske sestre / medicinska tehničara te 49 medicinskih sestara/tehničara pripravnika. Na pitanie smatraju li pripravnički staž potrebnim u zdravstvu 98,4 % ispitanika odgovorilo je pozitivno, pri čemu većina pripravnika (75,3 %) smatra da su potrebne izmjene pripravničkog staža. Rezultati hi-kvadrat testa govore u prilog tome da u odgovorima na pet pitanja postoje statistički značajne razlike u stavovima zaposlenih i pripravnika. Pripravnici su znanje o pripravničkom stažu ocijenili lošijim u odnosu na zaposlenike u zdravstvu i u drugim sustavima. Pripravnike pripravnički staž asocira na iskorištavanje, dok zaposlene osobe navode da ih asocira na osposobljavanje za samostalan rad. Većina zaposlenih u zdravstvu željela bi da njima bliska osoba ima pravo/obvezu odraditi pripravnički staž.

Analizom rezultata stavova prema pripravničkom stažu utvrđena je statistički značajna razlika među zaposlenicima i pripravnicima. Smatra se da velika odgovornost u osposobljavanju mladih prelazi na poslodavce koji bi trebali osigurati adekvatne edukacije i stalna praćenja novih radnika.

Ključne riječi: staž, sestrinstvo, prednosti, nedostaci, stavovi, pripravnici

Evaluation and Care of a Polytraumatized Patient

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Abstract

Polytrauma is a simultaneous severe injury to at least two body regions where at least one injury, or a combination of multiple injuries, endangers life. The spectrum of injuries and posttraumatic disorders is extremely wide. Most commonly they include shock, hypotension due to bleeding or vital organs injury. Injuries are the leading cause of death in developed countries today, and proportion of people who experience polytrauma in the total number of the injured is 3%, with a high mortality rate of 22%. Reanimation procedures and understanding of pathophysiology have progressed remarkably, and in the last twenty years, mortality has decreased by twenty percent. Time is a very valuable factor in the treatment of a polytraumatized patient and requires initiation of injury treatment within 60 minutes of its occurrence. In the clinical approach to treatment, algorithms for the treatment of polytrauma are used to achieve the best results of treatment and to reduce posttraumatic complications. Triage is a formal process through which the condition of all the patients is evaluated right after their arrival at the Emergency Department. Triage determines the urgency of the problem and assesses the allowed and expected waiting time for the beginning of the physician's examination and treatment of the patient. The approach to a polytraumatized patient is multidisciplinary, includes many specialties and requires continuous education and highly educated staff. High-quality skills, good communication and readiness to respond guickly and efficiently are just some of the key determinants of working with patients with life-threatening conditions.

Taking care of a polytraumatized patient is a great challenge even for a highly experienced multidisciplinary team because of the definition of polytrauma that indicates that you are dealing with a patient whose condition is life-threatening. Over time, the definition of polytrauma, given by H. Tscherne in 1984, has been shaped and it is still widely accepted. Instead of the organ system it mentions the body region (head, chest, belly, locomotor system) and it states: "Polytrauma is a simultaneous severe injury of at least two body regions where at least one injury, or a combination of them, endangers life" (1).

Polytrauma is considered to be the most complicated condition of a human organism. During polytrauma, the organism undergoes a series of pathophysiological processes that require extraordinary knowledge and skills from the people involved in the treatment and care. One of the key people in the treatment of a polytraumatized patient is also a nurse whose interventions include recognition, care and treatment of an emergency. The nurse must know how to act right at any time in order to save the patient's life and shorten the recovery. The basic things expected of a nurse in the treatment of a polytraumatized patient are: drug administration, taking samples for analysis, treating shock, stopping bleeding and the use of immobilisation agents (2).

The share of polytraumatized patients in the total number of injured people is 3%, and the mortality rate is high and ranges from 16% to 22%. In developed countries, the main cause of mortality from the age of 1 to 44 is an injury. Continuous investment and improvement of diagnostic and therapeutic procedures, improvement of early care and treatment quality, establishment of trauma centers resulted in a decline in mortality after polytrauma from 40% to 20% (2).

What is of utmost importance is the continuous education of healthcare workers involved in care, through trauma and advanced life support courses, and what is necessary is the understanding and proper use of algorithms for the treatment of polytraumatized patients. Adhering to these care procedures, investing in yourself and your knowledge, research, and training of a multidisciplinary team will reduce the chance of complications, speed up the recovery of a traumatized patient, and thus reduce the cost of treatment (1).

Polytrauma

The term polytrauma depends on the language source of the literature that is used: polytrauma (poly + trauma, root of the Greek word, many injuries) multiple injury, multiple injuries.

The term was first defined in Croatia by M. Grujić in 1962, but it did not specify the meaning of the "two systems", which later proved to be inadequate (2). Over time, the definition of polytrauma, given by H. Tscherne in 1984, has been shaped and it is still widely accepted. Instead of the organ system it mentions the body region (head, chest, belly, locomotor system) and it states: "Polytrauma is a simultaneous severe injury of at least two body regions where at least one injury, or a combination of them, endangers life" (1). Because of the differences in the definition of polytrauma, by comparing lethality through literature, we found a range of 9% to 48%, which points to differences in the definition of polytrauma rather than the quality of surgical treatment of a polytraumatized patient (2). According to the data of the Croatian Institute of Public Health, approximately 49,000 traumatized patients are treated annually in the Republic of Croatia. In 2016 there were 2,834 deaths (a rate of 67.9 per 100,000), out of which 2,087 were accidents (50 per 100,000). Among accidents, the most frequent deaths were due to falls (1,096 a rate of 26.3 per 100,000) and traffic accidents (390 a rate of 9.4 per 100,000). From the data we can conclude that traffic accidents and falls from height are the most common causes of polytrauma and the average age of the traumatized patient is 40 years (3).

We need to distinguish between three groups of injuries, depending on the need for an emergency treatment and a life-threatening condition. Firstly, there are critical injuries (airway obstruction, hypovolaemic or cardiogenic shock, heart and blood vessels injury, cardiac tamponade, flail chest). Then there are serious injuries and lastly, minor injuries, in which we include lacerations and less extensive injuries to the soft tissue, ligaments and joints, or cases requiring surgical treatment where patients are often not obliged to stay in hospital (4).



Figure 1. Accident cases in Croatia in 2016 Data source: Croatian Bureau of Statistics, 2017 (DEM-2/16) Data processing: Croatian Institute of Public Health, 2017.

(Suffocation 4%, other causes 16%, falls 53%, car accidents 19%, drowning 4%, poisoning 4%)

Rating scale

Trauma score scales are essential for treating trauma patients and for clinical investigations associated with trauma in order to estimate the severity of injury. There are several scales to assess the severity of an injury, mortality and morbidity, most notably the Glasgow Coma Scale (GCS), Revised Trauma Score (RTS), Abbreviated Injury Scale (AIS), Injury Severity Score (ISS) and Trauma and injury severity score (TRISS) (5). The quantification of the severity of the injury first began to appear in the Anglo-American scientific literature. Classification of the severity of the injury by various triage tag systems and clinical evaluation systems at the admission facilitates a decision on triage, identifies the patients with an unexpected outcome and provides data on the quality of follow-up of the treatment of the injured (5).

Injury Severity Score (ISS) and Abbreviated Injury Scale (AIS)

Today, the most commonly used scale in the world is the Injury Severity Score (ISS) and it is used for anatomical definition of multiple injuries. It is based on the Abbreviated Injury Scale (AIS) system, which marks the severity of each part of body and organ injury (5).

Table 1. AIS-grade description (4)		
AIS grade	Injury	
1	Minor	
2	Moderate	
3	Serious	
4	Severe	
5	Critical	
6	Unsurvivable	

The AIS table was first introduced in 1969 and has changed many times since then. The latest revision and the one in current use is the scale from 1998 (5). In the ISS scale, each injury is assigned an appropriate number for the severity of the most serious injury in a particular region of the body. The top three scores are squared and summed up. The obtained number indicates the ISS. The score can range from zero to seventy-five. It is important to note that limbs and pelvis are regarded as one region during the assessment, and the fracture of two bones and a pelvis, or fracture of multiple limbs are not regarded as polytrauma if there is no injury to another region (5). Most authors regard the ISS greater than 16 indicative of polytrauma.

Revised Trauma Score (RTS)

The Revised Trauma Score is considered one of the most commonly used physiological scale. It is based on the measurements of vital indicators of the pathophysiological disorder.

Management of polytrauma

According to older statistical models, the goal of taking care of patients was to prevent death. However, today's goal is to prevent death and prevent consequences that will significantly affect the quality of life after polytrauma. It is rare that the clinical condition is so different in procedures, type and time of treatment such as polytrauma. The reason for this are very complex injuries and damage and insufficiently explained body responses to stress and therapeutic procedures. Management of a polytraumatized patient starts at the site where the injury took place and risk assessment is of decisive importance (6). In assessing the condition of a polytraumatized patient, several factors that are indicators of the total severity of the injury should be taken into account and they are: state of conciousness, duration of hypotension, respiration, severity of individual injuries. By observing these indicators further diagnostic and therapeutic procedures are determined. The state of consciousness can be altered irrespectively of whether the patients have experienced a head trauma. If there is no indication of a head injury, consciousness disorder is most commonly caused by

Table 2. Calculation of ISS-a while applying AIS-grades (6)				
Body region	Injury description	AIS	Square top three	
Head and neck	Cerebral Contusion	3	9	
Face	No Injury	0		
Chest	Flail Chest	4	16	
Abdomen	Minor Contusion Of Liver Complex Rupture Spleen	2 5	25	
Extremities	Fractured Femur	3		
External	No Injury	0		
		ISS	50	

Table 3. RTS measurements and scores				
Glasgow Coma Scale	Systolic Blood Pressure	Respiratory Rate	RTS value	
13-15	>89	10-29	4	
9-12	76-89	>29	3	
6-8	50-75	6-9	2	
4-5	1-49	1-5	1	
3	0	0	0	

a reduced blood pressure and blood circulation. If we notice an injury then we use the Glasgow Coma Scale (GCS) (5).

The duration of hypotension is estimated according to the time of injury, the onset of emergency care and the measured pressure on arrival. If the patient has a blood pressure lower than 90 mmHg for a longer period, more serious condition of the injured patient is expected (5).

Chest injuries often cause disorder in breathing rhythm and quality, but there are also frequent changes in breathing, superficial breathing or full inhalations in patients with no chest injury (6).

The severity of the injury is assessed by clinical examination and the surgeon's experience. The main injury is the one that directly threatens the life of the patient, and more such injuries can be present. The main injury does not determine the patient's condition because all injuries affect the general condition of the patient. In Croatia blunt traumas more frequent than open wound injuries (1).

Assessment of the condition of patients using the ABCDE approach

When approaching the patient, it is necessary to assess whether the location is safe, to determine the nature of the injury, to determine the number of patients and whether additional medical staff, police or firefighters are needed. If additional help is required, it should be requested (8). Since time is precious in treating polytraumatized patients, it is essential to have a systematic, easy-to-understand and practical approach. Depending on the results of the assessment, a quick trauma or targeted examination is performed. If the mechanism of the injury is dangerous or the patient is unconscious a fast trauma examination is performed (from head to toe). If the mechanism of the injury suggests an isolated injury (stab wound or gunshot wound), an examination of the injury area is performed. Then follows the ABCDE assessment to determine the urgency and the presence of directly life-threatening conditions of the injured (8).

- A (airway) examination and assessment of the respiratory tract
- B (breathing) assessment of breathing
- C (circulation) circulatory assessment
- D (disability) a fast neurological assessment
- E (exposure) exposing the patient

Hospital care of polytraumatized patient

After pre-hospital assessment and care, the patient is transported to the nearest facility for further treatment. The polytraumatized patient and his or her arrival at the Unified Emergency Admission Department must be announced by the outpatient emergency team to timely gather the hospital team. A multidisciplinary team in the care of a polytraumatized patient is made up of a surgeon as a team leader, a younger physician, an anesthesiologist, Emergency Department head nurse, two nurses as members of the resuscitation team, a neurosurgeon for head traumas, an otorhinolaryngologist due to possible emergency tracheotomy (7).

Depending on the type of an injury specialists should be informed. The polytraumatized patient is placed in the resuscitation room and a primary examination to identify life-threatening conditions and injuries begins.

Triage

Triage is a formal process by which all patients are assessed immediately after their arrival at the Emergency Department. Triage estimates the urgency of the problem and assesses the expected waiting time for the initiation of the examination and treatment of the patient (6). We distinguish between three levels of triage. The first is pre-hospital and involves a decision on the need for intervention of the emergency medical team. The second level is performed on the spot when the emergency team comes into contact with the patient, and the third is performed in hospitals and emergency services, where triage is performed by experienced nurses (2).

The most widely used model is the Australasian Triage Scale (ATS), which consists of five categories of urgency. The first category includes an immediately life-threatening conditions, the second is a life-threatening condition and the maximum waiting time for a doctor's examination is 10 minutes. The third category includes potentially life-threatening condition or critical time, critical treatment and therapy, and a severe pain, and the maximum waiting time for doctor's examination is up to 30 minutes. The fourth category involves potentially life-threatening situations or situations of urgency, significant complexity, and maximum waiting time for the start of the examination is 60 minutes. In the last category there are less urgent states with waiting time for up to 120 minutes (7).

The purpose of the triage system is to ensure that the level and quality of health care provided to the community is proportionate to objective clinical criteria rather than administrative or organizational needs. Due to the complex nature of triage, nurses must have the knowledge of and experience with many diseases and injuries. The use of standard triage systems facilitates quality improvement at the Emergency Department. Re-triage is mandatory if the clinical status changes in such a way that this change affects the triage category itself, if we get information that can affect the triage category, and if the maximum allowed time for triage is exceeded. It is performed by a nurse and a physician, and the assessment itself should not last longer than five minutes (7).

The most common injuries in a polytraumatized patient

During a primary examination of life-threatening injuries, they should be identified immediately. Injuries can easily be remembered as "the deadly dozen": airway obstruction, flail chest, open pneumothorax, massive hematothorax, tension pneumothorax, cardiac tamponade, myocardial contusion, traumatic aortic disruption, tracheobronchial disruption, traumatic diaphragmatic rupture, pulmonary contusion and explosion injuries (8).

Immediate causes of death are the loss of too much blood, tissue hypoxia, intracranial hemorrhage, while the most common complication is sepsis with multiple organ failure and thromboembolism (8).

Despite progress and ongoing investment in the treatment of polytraumatized patients, mortality is still extremely high. There is a characteristic trimodal distribution of mortality. Immediate mortality, about 45%, refers to death at the accident site. Early mortality refers to death within three hours after the accident and amounts to 35%, and late mortality refers to days and weeks after the accident and it amounts to 20% (9).

1. Severe thoracic injuries

A simple rib fracture is the most common thoracic injury, and if there are no other fracture complications, the main problem is the pain that prevents normal breathing (10). Serious injuries can include a flail chest, open pneumothorax and a massive hemathorax. Pulmonary contusion is one of the more frequent injuries and is caused by bleeding into pulmonary parenchyma.

The nurse controls oxygen saturation in the blood with a pulse oximeter, if there is a need he or she gives oxygen, constantly monitors the heart rhythm and prepares the IV line for the required therapy. After each bolus of liquids, it is necessary to check the vital signs again.

2. Severe abdominal injury

The abdomen is the third most commonly injured region in a polytraumatized patient. Of the total number of injuries ending in the operating room, 20% refers to abdominal injuries. Complications occurring as a result of abdominal injury are bleeding and infection, and often hemorrhagic shock and postoperative complications occur as well (9).

Nurses' interventions are preparing multiple IV lines according to standard procedures, permanent monitoring of patients and observation of their condition and change in condition, pulse oximetry and the use of analgesics and therapies.

3. Head trauma

Head trauma is the leading cause of death or disability in polytraumatized patients. Often head trauma is accompanied by spinal injuries, therefore, immobilization immediately follows (6). In patients with head trauma nurse checks the pupils' reaction to light, symmetry and accommodation reflex, vital signs, GCS and anamnesis. Brain injuries usually occur as a result of head trauma (9).

The nurse must ensure the passage of airway, monitor the patient, monitor vital functions, and prepare multiple IV lines according to standard procedures. If it is necessary, he or she initiates cardiopulmonary resuscitation, monitors the patient, and if the patient vomits, turns him to a lateral position and if necessary, applies oropharynx suction. The main goal is to provide adequate brain oxygenation.

4. Spine trauma

In people who are conscious specific signs of spinal cord injury are neck and back pain, loss of sensation in the extremities and a feeling of burning. If a person is not conscious, it is necessary to monitor the vital functions, check the extremity temperature, breathing, and the presence of muscle reflexes (7).

Nurses' interventions are restraining the spinal mobility, checking and if necessary, opening the airway, checking vital functions, monitoring patients, preparing IV lines, and administering analgesics (7).

5. Pelvic and extremity trauma

Pelvic injury is most commonly associated with intraabdominal or intrathoracic injuries. Fractures of the extremities can be open and closed, they are very painful and can cause a loss of a large amount of blood. In addition to the fractures, joint dislocations are frequent and they are considered as an emergency condition because they can lead to disability or extremity amputation (9).

The nurses' interventions are, in addition to all the things mentioned in previous traumas and injuries - wound treatment, and immobilization of the extremities.

Nursing interventions in the care of a polytraumatized patient

The nursing care of patients with polytrauma encompasses a wide range of nurse's interventions. A nurse is an important link in a multidisciplinary team that takes care of a polytraumatized patient. To prevent complications and possible deaths, the ability and power of observation of each team member is essential. Skill, speed, education and the ability to make good assessment in critical situations are the qualities of highly educated and professional nurses in the care of a polytraumatized patient.

In addition to the above-mentioned interventions, such as making decisions about a triage category, helping and participating in a team, the nurse must provide timely help and provide a comfortable environment for the patient at the Emergency Department. Interventions of nurses must be in agreement with the patient, privacy must be ensured and the patient's dignity must be preserved. All interventions must be explained to the patient in an understandable manner, nursing interventions should not delay medical examinations and finally everything has to be documented in the nursing documentation (10).

In most cases nurses are not there only to stabilize the condition of a patient, but they need to provide psychological support to the patient and the family, talk to them and provide information within the code of ethics, encourage patients to be positive. Although it often seems as irrelevant, conversation and support help a lot later in recovery and rehabilitation. Guidelines and procedures involving nursing interventions must always be documented in the nursing documentation, especially in life-threatening situations (1).

Some of the basic nursing interventions are administering analgesics, antiemetics, antipyretics, oral rehydration and oxygen therapy, patient monitoring, immobilization, preparing IV lines, use of basic life support procedures, taking blood samples for analysis, wound treatment and stopping bleeding and many others (2).

Monitoring of patients in the intensive care unit

Conclusion

The purpose of monitoring is to identify and interpret the disorders in the physiological parameters of the patient and to take measures and interventions to eliminate and treat the already existing disorders. We divide monitoring it into non-invasive and invasive – in which skin is penetrated.

Basic patient monitoring includes the use of a pulse oximeter, capnometer, blood pressure measurement, ECG, body temperature measurement. Extended monitoring includes evoked potentials, electroencephalography, intracranial pressure, pulmonary artery pressure (7).

Neurological monitoring includes assessment of consciousness using the Glasgow Coma Scale, pupil evaluation, reflex presence, limb sensitivity, and cardiorespiratory evaluation. After the initial evaluation we use neurological monitoring to monitor the intracranial pressure that can be measured by an intraventricular catheter, subarachnoid screw, subdural or epidural catheter and fiber optic sensor (7). Regardless of the type of monitoring used, when introducing and using the system intracranially the use of asepsa must be strictly observed. With respiratory monitoring we monitor and evaluate adequate lung function. The nurse must regularly evaluate breathing parameters, function of respiratory muscles, skin color. Non-invasive monitoring involves pulse oximetry, capnography and capnometry for the analysis of carbon dioxide concentrations.

Cardiovascular monitoring, closely related to respiratory monitoring, allows for the cardiovascular function and heart function monitoring. Invasive monitoring by arterial cannulation allows for continuous monitoring of blood pressure and taking blood samples for analysis. Keeping in mind the complications that can arise from arterial cannulation, the nurse must regularly check the puncture site and monitor the symptoms and signs of complications such as thrombosis, infection, bleeding and side effects of therapy. Treatment of a polytraumatized patient is one of the most demanding and greatest challenges in medicine due to the complexity of the injury and still insufficiently researched stress response caused by multiple trauma and injury. It is necessary to introduce guidelines for the treatment of polytraumatized patients and to comply with standard procedures for each procedure that is being performed on patients.

The approach to polytraumatized patient is very complicated due to the severity of his or her condition. Firstly, the patient's life must be preserved and his condition stabilized while being transported to the nearest institution, in which diagnostics and advanced treatment of such condition are being carried out. Saving the patient's life is primary and treatment is more important than the final diagnosis. Due to the complexity of injuries and disorders in the care of a polytraumatized patient, a multidisciplinary team should be involved which can take care of and provide all the interventions that the patient's condition requires.

Interventions of a nurse as a member of a multidisciplinary team are of great importance from the admission until the discharge of the patient. Continuous education and skill improvement is required to develop the necessary competences that work in such circumstances requires because no state of polytrauma is the same, and the nurses daily encounter new types of polytrauma. As members of the team, nurses make a decision on a triage category, carry out interventions that are specific to certain conditions, monitor changes in vital functions, apply therapy, communicate with the patient, and ensure a safe and comfortable environment for the patient, and ultimately, document everything in the nursing documentation.

The success of the treatment of a polytraumatized patient depends on good co-operation and organization of the team, gaining experience through work and continuous education, investing in equipment and continually comparing results and quality of care with the previous results as well as the results of other trauma centers in order to reduce mortality, discover new and more effective ways of taking care of certain life-threatening conditions and shorten the time of rehabilitation.

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PROCJENA I ZBRINJAVANJE POLITRAUMATIZIRANOG BOLESNIKA

Sažetak

Politrauma je istodobna teška ozljeda najmanje dviju tjelesnih regija gdje najmanje jedna ozljeda ili kombinacija više njih ugrožavaju život. Spektar ozljeda i posttraumatskih poremećaja izrazito je širok. Najčešće uključuju šok, hipotenziju zbog krvarenja ili ozljeda vitalnih organa. Ozljede su danas vodeći uzrok smrti u razvijenim zemljama, a zastupljenost politraumatiziranih u ukupnom broju ozlijeđenih iznosi 3 % uz visoku stopu smrtnosti, koja doseže 22 %. Reanimacijski postupci i razumijevanje patofiziologije iznimno su napredovali te se u posljednjih dvadeset godina smrtnost smanjila za dvadeset posto. Vrijeme je vrlo dragocjen čimbenik u zbrinjavanju politraumatiziranog bolesnika te se zahtijeva početak zbrinjavanja ozljede unutar 60 minuta od njezina nastanka. U kliničkom pristupu liječenju primjenjuju se algoritmi za zbrinjavanje politraume s pomoću kojih se žele postići što bolji rezultati zbrinjavanja i smanjiti pojava posttraumatskih komplikacija. Trijaža je formalan proces kojim se svi bolesnici procjenjuju odmah nakon dolaska u odjel hitne medicine. Trijažom se određuje hitnost problema i procjenjuje dozvoljeno i očekivano vrijeme čekanja na početak pregleda liječnika i liječenja bolesnika. Pristup je politraumatiziranom bolesniku multidisciplinaran, uključuje brojne specijalnosti te zahtijeva kontinuiranu edukaciju i visokoobrazovano osoblje. Kvalitetne vještine, dobra komunikacija i spremnost da se reagira brzo i kvalitetno samo su neke od ključnih odrednica za rad s vitalno ugroženim bolesnicima.

Ključne riječi: politrauma, algoritam zbrinjavanja, trijaža, multidisciplinarni tim

The Importance of Oral Hygiene in Reducing the Incidence of Ventilator-Associated Pneumonia - a Systematic Review

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Keywords: oral hygiene, ventilator-associated pneumonia, intensive care unit, nursing

Abstract

Introduction. Healthcare-associated infections (HCAIs) represent a major public health problem. Inadequate oral hygiene in intensive care units has been recognized as a critical issue for the occurrence of one of these infections – ventilator-associated pneumonia (VAP). Although literature suggests diverse oral care measures for ICU patients, the effectiveness of each is still a subject for further trials.

Aim. The purpose of this paper is to determine the association between diverse oral care measures and the incidence of ventilator-associated pneumonia.

Methods. A systematic review of literature in the PubMed database that evaluates the performance of diverse oral care measures and their impact in reducing the incidence of VAP. The keywords used as search terms were: oral hygiene, ventilator-associated pneumonia, intensive care unit and nursing.

Results. Four articles in total were taken into consideration in accordance with the availability of full-text articles and years of publication between 2009 and 2019. Performance results of diverse oral care measures haven't shown statistically significant differences, but the implementation of oral care as a preventive measure against VAP showed a significant role in lower incidence rates.

Conclusion. The results of the systematic literature review confirmed the importance of oral care in lowering the incidence rate of VAP. However, significant differences have been noted between the efficiency of diverse oral care measures and the incidence rate of VAP.

Introduction

Healthcare-associated infections (HCAIs) represent a major public health problem. They are defined as infections that occur 48-72 hours after admission to the hospital. The development of nosocomial infections is dependent on two key pathophysiological factors: compromised immune system of the host and colonization by pathogenic or potentially pathogenic bacteria and other microorganisms (1).

In intensive care units, the risk for healthcare-associated infections is significantly high. Research shows that HCAIs can affect about 30% of patients in intensive care units and that they are associated with substantial morbidity and mortality. The use of catheters and other invasive equipment, and certain groups of patients, e.g. those with trauma or burns, are recognized as being more susceptible to HCAIs than others. Although HCAIs can affect any part of the body, respiratory tract infections are most frequent (1).

Patients in the intensive care unit (ICU) are at risk of dying not only from their critical illness but also from secondary illnesses caused by HCAIs. One of the most frequent infections in ICU is ventilator-associated pneumonia which occurs 48-72 hours after patients have been intubated and received mechanical ventilation (2). VAP is estimated to occur in 9-27% of all mechanically ventilated patients, with the highest risk being in the first 5 days of hospitalization (3). VAP develops through aspiration of altered oral bacterial flora (mainly gram-negative microorganisms) into the normally sterile lower respiratory tract (4). The presence of an endotracheal tube is the most important risk factor for developing VAP resulting in the suppression of the cough reflex which is a natural defense mechanism of the respiratory tract. With microaspiration during intubation itself, development of a biofilm laden with gram-negative bacteria and fungal organisms within the endotracheal tube, pooling and trickling of secretions around the cuff and impairment of mucociliary clearance of secretions, infectious bacteria develop direct access to the lower respiratory tract (3). VAP prolongs the length of hospitalization and increases treatment costs. Previous studies have shown twice as long hospital stay and two times larger treatment costs for patients suffering from VAP infection (5).

The oral cavity of mechanically ventilated patients is a reservoir for pathogens, and the tendency of creating dental plaques is significantly increased (4, 6). For that reason, the aim of routine oral care is to reduce the microbial plaque and help to prevent VAP infection (4, 6). Oral hygiene is one of the essential parts of nursing care and an integral aspect of nursing care provided in intensive care units. Inadequate oral hygiene in combination with providing mechanical ventilation offers even greater risk of developing VAP. Unfortunately, the efficiency of oral care measures in critically ill patients has not been well studied (6). Evidence-based protocols of providing oral care in ICU have not been conducted and oral care measures are still performed inconsistently and in a diverse manner, with the great difference between individual ICUs and dependency on the nursing staff's perception of the importance of providing oral care. Moreover, diverse oral care measures, mechanical (toothbrushing), pharmacological (topical use of chlorhexidine) and combination of pharmacological and mechanical, show different effectiveness with regards to the lowering of VAP rate (6, 7). For that reason, it is necessary to increase the nursing staff's awareness of providing good quality oral hygiene to critically ill patients. To achieve that, implementing a standardized, evidence-based protocol of oral hygiene is increasingly emphasized (7).

The purpose of this paper is to determine the association between diverse oral care measures and the incidence of ventilator-associated pneumonia.

Methods

A systematic review of literature in the PubMed database that evaluates the performance of diverse oral care measures and their impact in reducing the incidence of VAP. The keywords used as search terms were: oral hygiene, ventilator associated pneumonia, intensive care unit and nursing. The selection criteria (Table 1) for further filtration of the results included only original research (article type: clinical trial), published between 2009 and 2019, written in English and available in full-length format. The studies with a date of publication before 2009 were excluded. The search process yielded 63 articles in total. After applying the inclusion and exclusion criteria, 6 articles were selected for a more detailed analysis. All identified studies were assessed for relevance based on title and abstract. Further analysis resulted in the exclusion of two articles: one referring to the oral care measures only in children population, and another testing effectiveness of oral care interventions only in neuroscience ICU patients. After analysing the title and abstracts, 4 articles in total were included in this systematic review.

Results

Four articles that matched the selection criteria were analysed in this systematic review. The studies are from different parts of the world: Iran, India, Taiwan and the USA, published in different time periods: 2009, 2011, 2016 and 2017. An overview of the studies included is presented as a Prisma 2009 Flow Diagram (Figure 1).

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

Haghighi et al. (2016) conducted a research with the aim to identify the impact of oral care practices on the oral health status of patients in the intensive care unit and the incidence rate of ventilator-associated pneumonia. The clinical trial recruited 100 participants who were randomly assigned to a control group and an intervention group. Some of the inclusion criteria for participating were: being intubated, mechanically ventilated for more than 48h, having no lung disease or pneumonia (CPIS score lower than 6) or sepsis. The oral care routine of the intervention group included toothbrushing (with a child-sized toothbrush) using rotational movements, rinsing the mouth with a normal saline 0.9% solution and then spraying with 5 ml, 0.2% chlorhexidine. Deep suction was performed after 30 seconds. This routine of oral care was performed every 12 h, 8 h, 6 h and 4 h, depending on the patient's health status. 0.2% chlorhexidine was used every 12 h. The control group received routine oral care including brushing the teeth with a toothpaste once a day and mouth washing with chlorhexidine 0.2% solution twice a day. Oral care was performed by nursing staff with long work experience in the ICU. The incidence of VAP was measured by the Clinical Pulmonary Infection Score (CPIS). The results showed a VAP incidence of 10% and 14% the first and third day for the control group, and 4% and 10% for the intervention group. Although a Fisher's Exact test showed that pneumonia incidence rate on the third and fifth day was not statistically different between the two groups (p>0.05), the incidence of VAP in the intervention group decreased (8).

Chacko et al. (2017) aimed to investigate the efficiency of new oral hygiene techniques (toothbrushing with chlorhexidine and suctioning technique versus mouth swabbing with chlorhexidine) in order to evaluate association with VAP incidence. The study recruited 206 subjects divided into a control and an experimental group. Oral care was provided by nursing staff three times a day. The control group received routine oral care which included swabbing the oral cavity with sponges soaked in chlorhexidine gluconate 0.2%. Patients in the experimental group received oral care by toothbrushing with 0.2% chlorhexidine. After that the oral cavity was aspirated

Table 1. Inclusion and exclusion criteria				
Selection criteria	Inclusion	Exclusion		
Article category	Original research (type: Clinical Trial)	Review articles Systematic articles and other		
Keywords	"oral hygiene" "ventilator-associated pneumonia" "nursing" "intensive care unit"	"neuroscience ICU patients" "gram-negative pathogens in children"		
Date of publishing	2009-2019	Before 2009		
Language	English	All others		

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Figure 1. Flowchart of article search and selection process

with the Yankauer suction catheter. Of the 206 subjects recruited, 12 patients developed VAP, 5 from the experimental group and 7 from the control group. The incidence of VAP in the recruited group was only 10.1 per 1000 ventilator days, 8.6/1000 ventilator days for the experimental group and 11.6/1000 ventilator days in the control group. Consequently, there was no statistically significant difference in the incidence of VAP between the two groups (p>0.05) (9).

In the year 2009 Munro and associates wanted to examine the effects of mechanical (toothbrushing),

pharmacological (topical oral chlorhexidine), and combination (toothbrushing plus chlorhexidine) oral care on the development of ventilator-associated pneumonia in critically ill patients receiving mechanical ventilation. For that purpose, they conducted a randomized controlled clinical trial. The trial consisted of 547 participants who were randomly assigned to a 1 of 4 treatments: 5ml 0.12 % chlorhexidine oral swab twice a day, toothbrushing three times a day, both toothbrushing and chlorhexidine (every 12 h), or control group (usual care). The VAP incidence was meas-
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Table 2. Overview of the studies finally included (VAP incidence)			
DOCUMENT	AIM	STUDY DESIGN AND DESCRIPTION OF RESEARCH	RESULTS
Haghighi A. et al. (8) Iran	Identify the impact of oral care practices on the oral health status of patients in ICU and the incidence rate of VAP.	A randomized controlled clinical trial conducted from October 2015 to February 2016. 100 participants N1=50 (control group) N2=50 (intervention group)	No significant differences in CPIS between the two groups on the third and fifth day of trial.
			p1=0.436 p2=0.538
		Methodology : Clinical Pulmonary Infection Score (CPIS)	*(p<0.05) statistically significant p1=third day, p2=fifth day
Chacko R. et al. (9) India	To assess the efficacy of a new technique of oral care in reducing the incidence of VAP.	A prospective, randomised, 'double-blind' study undertaken from 14 January 2014 to 27 December 2014. 206 participants.	No significant difference in the incidence of VAP between the two groups (<i>p</i> =0.82)
		N1=102 (control group) N2=104 (experimental group)	*(p<0.05) statistically significant
Munro C. et al. (10) USA	To determine if 2 oral care interventions, chlorhexidine and toothbrushing, would reduce the risk for VAP during tho first wook	A randomized controlled 2×2 factorial experimental design. 547 participants; 4 groups	No significant differences in CPIS between the four groups.
			The mixed model analysis showed no effect of either chlorbeviding (σ 1 =0.29) or
		Methodology : Clinical Pulmonary Infection Score (CPIS)	toothbrushing (p2=0.95)
	the first week.		*(p<0.05) statistically significant
Yao L. et al. (11) Taiwan	To evaluate the effects of brushing teeth twice a day with purified water on VAP rates and oral health or hygiene.	This single-blind pilot randomized controlled trial undertaken from March to November 2007. 53 participants N1=28 (experimental group)	The cumulative VAP rates were significantly lower in the experimental (17%) than in the control (71%) group (<i>p</i> <0.01)
		N2= 25 (control group)	(p<0.05) EG (p<0.01) EG
		Methodology :	
		VAP rates: Kaplan-Meier, log-rank test OAG score	*p<0.05, p<0.01 statistically significant
		Plaque index	**EG (experimental group)

ured with Clinical Pulmonary Infection Score (CPIS) throughout the period of 7 days. Results showed no significant differences between those treatments. On day three of the study the interaction of toothbrushing and chlorhexidine was not significant, so that method was not included in final analysis models. Analysing the results of all treatments showed no statistical significance between toothbrushing and topical chlorhexidine (p>0.50). However, the results showed that patients who had CPIS>6 the first day and had received chlorhexidine had significantly lower CPIS values on day 3, and pneumonia developed in significantly fewer patients. To conclude, topical use of chlorhexidine lowered the VAP incidence by day three of the trial (p=0.006). Toothbrushing had no influence on CPIS score (or VAP incidence) and combining toothbrushing and chlorhexidine did not provide additional benefit over the use of chlorhexidine alone (10).

Yao et al. (2011) conducted randomized controlled pilot trial whose aim was to evaluate the effects of brushing teeth twice a day with purified water on VAP rates in the post-operative neurosurgical intensive care unit. 53 patients participated in the trial, divided into an experimental and a control group. Both groups received usual hospital care that included daily oral care using cotton swabs. The experimental group received an oral care protocol of toothbrushing with purified water twice a day. The incidence of VAP was measured with the Clinical Pulmonary Infection Score (CPIS). Results showed a lower incidence rate in the experimental group (17%) compared to the control group (71%; p<0.01). Furthermore, the experimental group showed better results in the Plaque Index and general estimation of oral health and hygiene (OAG score) (p<0.01) (11).

Discussion

Oral hygiene affects many aspects of oral and general health of ICU patients. However, most attention is paid to the development of ventilator-associated pneumonia and, therefore, oral hygiene is recognized as one of the most important measures of VAP prevention (12). The VAP care bundle differs from institution to institution, but according to NHS-u (National Health Service, UK, 2016), it includes a group of interventions: elevation of the head of the bed, sedation level assessment, oral hygiene, subglottic aspiration, maintenance of tracheal tube cuff pressure and stress ulcer prophylaxis (13). One of the main components of the VAP care bundle is the already mentioned oral hygiene and nursing staff being essential for its proper performance. To conclude, comprehensive and standardized oral care can significantly reduce the incidence of respiratory tract infections by reducing the colonization and formation of dental plaques (6,14). Summing up the results of the research shown in the articles, there are no statistically significant differences in the incidence of VAP when comparing different oral care measures of oral hygiene. This proposes the question of the efficiency of these measures and highlights the further need for more detailed research and analysis of each method of oral hygiene. However, taking into consideration the set of all research results (8-11), the importance of oral hygiene in the VAP prevention care bundle has been confirmed. The proof of that hypothesis has been confirmed by similar previous studies.

For example, Mori et al. (2006) also investigated the importance of oral hygiene in VAP prevention. They conducted a nonrandomized clinical trial of over 1248 participants divided into two groups. The group that was given oral care (*oral care group*) and a group that had not received oral care (non-oral care group). The oral hygiene protocol in the oral care group was performed 1-3 times a day by two medical staff members, a dentist and a nurse specially educated for providing oral hygiene. In the oral hygiene protocol cuff pressure of the tracheal tube was increased to 100 mmHg, oropharyngeal secretions suction in the oral cavity, oral cavity was cleansed using a swab soaked in 20-fold diluted povidone-iodine gargle, a toothbrush was used and the oral cavity was rinsed with 300 ml weakly acidic water. Cleansing of the oral cavity was repeated using a swab soaked in 20-fold diluted povidone-iodine gargle. The suction of the oral cavity and portion of the trachea above the cuff was provided again and the cuff pressure was restored. VAP incidence was expressed in terms of 1000 days of mechanical ventilation. The results showed a significantly lower incidence in the oral care group (3.9 versus 10.4/1000, p>0.001) (15).

A systematic review of literature confirmed the importance of oral hygiene in patients on mechanical ventilation as one of the main preventive measures of the ventilator care bundle. Taking into consideration the results of all four articles presented in this review, it cannot be concluded which method of oral hygiene is the most efficient because the trials were not based on the same methods but the combinations of various. The efficiency of one method (e.g. toothbrushing) was not individually evaluated, and thus proper comparison cannot be conducted. However, analysing the trials in the articles (8-10), and comparing the methods within each of them, it is noticeable that the use of chlorhexidine (whether applied in combination with any other method or alone) has a greater effect on reducing the incidence of VAP from other methods (e.g. toothbrushing).

The importance of toothbrushing, which is the basic mechanical method of maintaining the oral cavity hygiene and generally the most frequent oral health care technique in critical and mechanically ventilated patients, is not sufficiently emphasized or researched. It is often neglected and replaced by some other alternative methods, such as using cotton swabs. Reasons why toothbrushing is not a practical method are complex patients' conditions and the presence of endotracheal tube or nasogastric probe (16). Although further research is required to analyse toothbrushing in mechanically ventilated patients, the way of performing it, its safety and the effect on reducing dental plaque, the systematic review confirmed its importance in the trial of Yao et.al. The cumulative VAP rates were lower using toothbrushing than providing the usual care with cotton swabs (11).

Therefore, toothbrushing as an oral hygiene method should be an integral part of the oral hygiene protocols. The importance of specified procedures and combination of various methods of hygiene (toothbrushing, application of chlorhexidine, rinsing, suctioning, mucosal moisturizing, etc.) with the aim of providing the most effective oral health protection and VAP prevention, i.e. conducting of protocol, is emphasized in the research of Haghighi et al. (2016). VAP incidence in the intervention group, which was exposed to a methodically defined protocol in a set period of time that included a combination of mechanical and pharmacological methods of hygiene, was reduced by 54% (8).

The positive side of conducting the standardized protocol of oral cavity hygiene is confirmed by Hutchins et al. (2009). They initiated a program to improve oral hygiene quality in order to reduce VAP incidence in the period from 2004 to 2007. All patients admitted to the intensive care unit were included in the program unless they had contraindications for oral hygiene interventions. Patients were subjected to oral cavity hygiene that was performed every 4 hours, and consisted of exactly prescribed instructions that included different oral hygiene techniques such as toothbrushing with 0.12% chlorhexidine twice a day, aspiration of the secretion every 12 hours, tooth and tongue cleaning with hydrogen peroxide swabs, and moisturizing mucosal lips, lips and mouth cavities every 4 hours. Over a three-year period, the results showed that compliance with the hygiene program caused VAP incidence to decrease by 89.7% (17).

A similar protocol of oral care was tested by Garcia et al (2009) in a 48-month study. VAP incidence was measured in the pre-intervention period in which patients included in the study received "standard oral hygiene" of the institution. After educating all health professionals about various VAP related items (mortality, costs, morbidity, etc.) and pointing out the importance of implementing systematic comprehensive oral hygiene, which involved various oral hygiene measures performed at specific time period (aspiration, toothbrushing, oral cavity cleansing etc.), the incidence rate of VAP was measured. The results indicated a decrease in the incidence from 12/1000 days of mechanical ventilation in the pre-intervention period to 8/1000 days of mechanical ventilation during the intervention period (p=0.06). Consequently, it has been confirmed that the existence of a clearly defined protocol of oral hygiene and the compliance of health-care personnel with the protocol can significantly reduce the rate of pneumonia in patients on mechanical ventilation, and thus the costs of hospitalization (18).

All examples of analysed studies in this systematic review confirm the importance of implementing oral hygiene as an indispensable part of the nursing care provided in intensive care units. The nursing staff is mostly aware of this importance, but the correlation between frequency, consistency and effectiveness of oral hygiene techniques and reduction of oropharyngeal colonization is less known and further research is needed to address this issue. Exposure of patients in intensive care units to healthcare-associated infections such as VAP, highlights the importance of developing new strategies for improving oral cavity hygiene in order to reduce morbidity and mortality (19).

In accordance with the results of the systematic review of literature, there is a difference in the effectiveness of oral hygiene techniques and the results of their effectiveness in reducing VAP. Some of the techniques are more effective than others, while some do not show any efficacy.

Furthermore, the standardization of specific guidelines for the implementation of oral hygiene with a purpose of preventing VAP, the provision of hygiene protocols that would involve a combination of different methods according to the possibilities of implementation, defined time sequence of execution and the ability to monitor and evaluate these processes can improve the overall clinical outcome of the patient, and because of that, represent a very important item of further research. 110 Buković E. et al. The Importance of Oral Hygiene in Reducing the Incidence of Ventilator-Associated Pneumonia. Croat Nurs J. 2019; 3(1): 103-111.

Conclusion

The findings of this systematic review confirm that oral hygiene is important in reducing the incidence of ventilator-associated pneumonia. It is apparent from the results that standard hygiene involving different methods (toothbrushing, chlorhexidine use, suctioning, cleaning with cotton swabs, moisturizing and etc.), which differs from one institution to another, does not show the complete consistency and the efficiency of each of these methods shows different results. To conclude, there is a need for specific guidelines and standardized oral hygiene protocols that will incorporate a combination of methods and specify the exact order of performing oral hygiene to achieve the best results in preventing and reducing VAP.

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VAŽNOST ORALNE HIGIJENE U SMANJENJU INCIDENCIJE VENTILATOROM UZROKOVANE PNEUMONIJE - SUSTAVNI PREGLED LITERATURE

Sažetak

Uvod. Infekcije povezane s bolničkom skrbi predstavljaju veliki javnozdravstveni problem. Neadekvatna oralna higijena u jedinicama intenzivnog liječenja jedan je od rizičnih čimbenika za nastanak jedne od takvih infekcija – ventilatorom uzrokovane pneumonije. Postoje različite tehnike provođenja higijene, no efikasnost svake od njih još je uvijek područje istraživanja.

Cilj. Utvrditi povezanost metoda higijene usne šupljine i pojave ventilatorom uzrokovane pneumonije.

Metode. Sustavni pregled literature u bazi podataka PubMed u cilju pronalaženja članaka koji evaluiraju povođenje higijene usne šupljine i njihov utjecaj na incidenciju VAP-a. Ključne riječi upotrijebljene u pretraživanju baze: oralna higijena, ventilatorom uzrokovana pneumonija, jedinica intenzivnog liječenja, sestrinstvo.

Rezultati. U obradu su uzeta četiri članka prema kriterijima dostupnosti cjelovitog teksta i godinama publikacije između 2009. i 2019. Rezultati nisu pokazali statistički vidljive razlike u incidenciji VAP-a na temelju različitih metoda održavanja oralne higijene, no implementacijom oralne higijene kao sastavne preventivne mjere VAP-a vidljiv je znatan utjecaj na smanjenje incidencije.

Zaključak. Rezultati sustavnog pregleda literature potvrdili su važnost provođenja higijene usne šupljine u svrhu smanjenja incidencije VAP-a. Međutim, vidljive su razlike u efikasnosti metoda provođenja higijene u pogledu njihova utjecaja na smanjenje stope VAP-a.

Ključne riječi: oralna higijena, ventilatorom uzrokovana pneumonija, jedinica intenzivnog liječenja, sestrinstvo

Author Guidelines

AIM AND SCOPE

Croatian Nursing Journal is a peer-reviewed nursing journal that publishes original articles that advance and improve nursing science and practice and that serve the purpose of transfer of original and valuable information to journal readers. Croatian Nursing Journal is published biannualy in the English language. Authors are invited to submit original papers in the form of research findings, systematic and methodological review and literature review related to nursing.

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The manuscript must be prepared using Microsoft Office Word, in a 12-point font, double spacing, in either Times New Roman, Arial or Calibri.

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Introduction/Background

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Methods

Describe the selection and identify all important characteristics of the observational or experimental participants. Specify carefully what the descriptors mean, and explain how the data were collected. Identify the methods, apparatus with the manufacturer's name and address in parentheses, and procedures in sufficient detail to allow other workers to reproduce the results. Provide references to established methods and statistical methods used. Describe new or substantially modified methods, give reasons for using them, and evaluate their limitations. Identify precisely all drugs and chemicals used. Use only generic names of drugs. All measurements should be expressed in SI units.

Ethics

Papers dealing with experiments on human subjects should clearly indicate that the procedures followed were in accordance with the ethical standards of the institutional or regional responsible committee on human experimentation and with the Helsinki Declaration and Uniform Requirements for Manuscripts submitted to Biomedical journals. This must be stated at an appropriate point in the article.

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Describe statistical methods with enough detail to enable a knowledgeable reader with access to the original data to verify the reported results. Whenever possible, quantify findings and present them with appropriate indicators of measurement error or uncertainty. Specify the statistical software package(s) and versions used.

Results

Present your results in logical sequence in the text, tables, and illustrations. Do not repeat in the text all the data in the tables or illustrations; emphasize or summarize main findings. Provide exact *P*-values with three decimal places or as P<0.001.

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Emphasize the new and important aspects of the study and the conclusions that follow from them. Do not repeat in detail data or other material given in the Introduction or the Results section. Include in the Discussion section the implications of the findings and their limitations, including implications for future research, but avoid unqualified statements and conclusions not completely supported by the data. Relate the observations from your study to other relevant studies. State new hypotheses when warranted, but clearly label them as such.

Conclusion

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Use only standard abbreviations. The full term for which an abbreviation stands should precede its first use in the text unless it is a standard unit of measurement.

Acknowledgments

List all contributors who do not meet the criteria for authorship, such as a person who provided purely technical help, writing assistance, or a department chair who provided only general support. Financial and material support should also be acknowledged.

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