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Evaluation of Patients' Nursing Care Outcomes Following Thrombolytic Therapy – a Retrospective Study

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Abstract

Introduction. Nursing documentation is an indicator of healthcare quality. After extensive data analysis, it has been shown that nursing documentation has become an assessment tool and a tool to change clinical practice. Stroke is the most significant individual cause of disability in the adult population. In instances of ischemic stroke, brain circulation is abruptly disconnected. Causes of this break in blood flow may be blockage or compression of blood vessels due to thrombosis, embolism or systemic hypoperfusion. Therapy administered in cases of acute ischemic stroke includes intravenous thrombolytic therapy – recombined tissue activator of plasminogen within 180, i.e. 270 minutes of the stroke.

Aim. To determine the quality of outcomes as regards patient care after administering thrombolytic therapy in a display of progress notes of patients' condition during their stay in the hospital, both before and after administering thrombolytic therapy.

Methods. A retrospective study was carried out at the neurology department of „Dr. Ivo Pedišić" General Hospital in Sisak during 43 months from January 1, 2013 to May 31, 2017. 85 patients participated in the study. Data were obtained from one component of nursing documentation in electronic form, namely progress notes on the patients' conditions.

Results. With a 95% confidence level, a statistically significant difference ($p<0.05$) was found for parameters of hygiene, feeding, elimination, dressing, walking, moving, sitting, standing, turning, nutrition - diet, strain tolerance, Braden scale and categorization, before and after thrombolytic therapy. Statistical significance was not found in the parameters of pain ($p=0.067$), GCS/Trauma score scale ($p=0.339$), risk of fall ($p=0.072$).

Conclusion. The implementation of the healthcare process, continued monitoring of the patient's condition and progress, as well as validation of nursing activities provide an imperative for the application of nursing documentation as an essential tool in describing regular nursing activities. Application of documentation enables a more permanent insight into a patient's general state, data availability, care continuity, progress chronology and result evaluation, as well as a material background for professional, expert and scientific development of nurses through studies in the field of nursing.

Introduction

In a year, around 17 million people around the world suffer a stroke, with 6 million dying of the consequences caused by a stroke. One third of all stroke survivors have a certain level of temporary disability to function independently on a daily basis, one third recovers and one third stays permanently disabled (1). As many as 1 in 6 persons aged 15-60 are at risk of suffering a stroke (2). Considering population's aging, it is estimated that by 2020 stroke will be the leading cause of loss of health (3).

Stroke is the single largest individual cause of disability in adult population. If a person has already survived a stroke, it is highly likely that a potential second one will either be fatal or cause a high level of disability (4). According to statistical data, every year approximately 750 thousand people suffer a stroke in Europe, and the number is similar in the United States of America. Stroke is a major health issue, not only in developed, but also in developing countries (5). Stroke has been both the leading cause of mortality and the leading cause of disability in the Republic of Croatia in the last few years. Stroke is not only a health problem, it is also a major economic and socio-economic problem. In the Republic of Croatia, about 25 thousand people per year suffer a stroke, and 8 thousand die from a stroke, meaning that alongside coronary conditions, it is one of the leading causes of mortality (6). World Health Organization defines a stroke as "suddenly developing clinical signals of focal or global disruption of cerebral function, with symptoms lasting 24 hours or longer, or leading to death, without an evident other cause apart from signs of blood vessels damage" (7). 75 to 80 percent of all strokes are caused by a clot in blood vessels (8).

In instances of ischemic stroke, brain circulation is abruptly disconnected. Causes of this break in blood flow may be blockage or compression of blood vessels due to thrombosis, embolism or systemic hypoperfusion (9). The remaining 20-25 percent of cases of stroke are caused by various forms of blood hemorrhaging prompted by a rupture in one of the brain's blood vessels due to high blood pressure, natural weakness in the wall of the blood vessels or artery-vein malformation (10). A hemorrhaging stroke indicates blood pooling within the brain tissue or areas surrounding it. According to localization, we can differentiate bleeding within the cerebral parenchyma when smaller arteries are prone to arteriosclerosis and epidural, subdural and subarachnoid bleeding (11). Stroke is a multi-factor condition caused by a combination of vascular risk factors, the environment and genetic predisposition. Stroke risk factors can be divided into those we have the capacity to influence and those we cannot control (12,13). Stroke presents a medical emergency. Therapy administered in cases of acute ischemic stroke includes intravenous thrombolytic therapy – recombined tissue plasminogen activator within 180, i.e. 270 minutes of the stroke and under the condition it meets the criteria of NIHSS (*National Institute of Health Stroke Score*) (14-17). Plasmin is an enzyme which dissolves fibrin, a protein which constitutes the main part of the blood clot. In that way circulation is re-established and nerve cells dying prevented. The objective of thrombolytic therapy is to re-establish circulation, i.e. reperfusion of the ischemic area (8).

In June 1996 a recombined tissue plasminogen activator (rt-PA) became the first drug approved by the FDA (Food and Drug Administration) for the treatment of stroke. It has been proven that the drug is efficient only within the 180 minutes from the first symptoms, making stroke a medical emergency (18). The short time period to administer the drug demands a fast assessment of patients who are suspected of suffering a stroke. Two-stage research on the utility of the intravenously administered thrombolytic therapy was completed in 1995 and in the same year the results were published in the National Institute of Neurological Disorders and Stroke, (NINDS) in the United States of America (19).

Both research stages included 624 respondents who were administered either thrombolytic therapy (0.9 mg/ kg) or a placebo within three hours of the first symptoms. The research showed that the patients who were given thrombolytic therapy had a significantly higher likelihood of functional independence with minimum or no disability within three months of the treatment. The share of patients with minimum or no disability grew from 38 percent of placebo patients to 50 percent of those administered rt-PA, indicating a 12-percent increase in improved condition. Intracerebral haemorrhaging connected to administering rt-PA caused a worse final outcome in only 1 percent of all patients. In total, in every 100 patients treated in the first three hours, 32 had a better out-

come and 3 a worse outcome (20). In a typical medial cerebral arterial ischemic stroke, a person loses 2 million nerve cells in one minute unless reperfusion is accomplished (21). The analysis of 3670 patients included in the first eight rt-PA studies provided clear and plausible evidence as regards dependence on the time of administering thrombolytic therapy. Treatment in the first 90 minutes increases the likelihood of an excellent outcome by 2.6 times, in the therapy window of 91-180 minutes by 1.6 times, and in the therapy window of 181 to 270 minutes 1.3 times, while treatment in the 271 to 360 minutes does not improve outcomes in a statistically relevant way. Thus, the sooner therapy is administered, the better the outcome for the patient (20). Patients who meet the criteria for rt-PA treatment within 3 hours of the beginning of stroke should be treated as recommended in the guidelines from 2007. In May 2009 and again in March 2013 the guidelines by the American Heart Association/ American Stroke Association for administering rt-PA after an acute stroke have been revised so as to open up the window for treatment from 3 to 4.5 hours with the objective of enabling drug administration to a greater number of patients (22-24). Patients who meet the condition should be administered rt-PA therapy as soon as possible, ideally 60 minutes upon arrival to the hospital (15).

The application of nursing documentation during patients' hospitalization ensured the possibility of monitoring both the quantity and quality of treatments administered, especially the possibility of permanently monitoring a patient's condition. Without records on nurses' interventions it would be extremely difficult to evaluate healthcare and treatments during hospital stay. Respective parts of nursing documentation provide grounds for continued care and timely involvement of domiciliary care and healthcare activities at home. Nursing documentation also presents a sum of data which can be utilized for the purposes of research (25). Nurses' interventions on patients who had been administered thrombolytic therapy, apart from enabling a high level of treatment safety, greatly affect the quality level of patients' condition during hospitalization, of which there is no previous evidence found in nursing research in the Republic of Croatia. This has been established by searching *Hrčak,* the Croatian scientific journal portal, by using keywords *nursing documentation, outcomes, thrombolysis*. Pursuant to analysing summary parameters of progress notes for monitoring patients' condition, this paper investigates the quality of outcomes of patient care after the administration of thrombolysis therapy.

Methods

The retrospective study was conducted by analysing the electronic forms of 85 nursing notes of patients who were administered thrombolytic therapy. The study was carried out at the neurology department of „Dr. Ivo Pedišić" General Hospital in Sisak from January 1, 2013 to May 31, 2017. The study was founded on the hypothesis that there is a significant difference in the amount of necessary nursing care after the administration of thrombolytic therapy.

Statistical analysis of the patient condition notes before and after thrombolytic therapy was carried out. Data gathered in the study is data of the patient condition notes entered into the electronic nursing documentation just moments before thrombolytic therapy was administered. Data collected for the needs of the study after thrombolytic therapy was administered relates to data entered into the electronic nursing documentation at patients' discharge independently of the duration of their hospital stay. The patient condition notes contain the following parameters: hygiene, feeding, elimination, dressing, walking, moving, sitting, standing, turning, nutrition - diet, strain tolerance, Glasgow coma scale (GCS)/ Trauma score scale, Braden scale, risk of fall and categorization. The parameters have been assessed in accordance with the descriptions as listed in the Nursing List of the Croatian Nursing Council (26). The testing was conducted using the Wilcox test of equivalent pairs for the purpose of establishing ranking values of observed groups. Nonparametric statistic was selected, considering the sample <100.

The study was approved by the Ethical Committee of „Dr. Ivo Pedišić" General Hospital in Sisak.

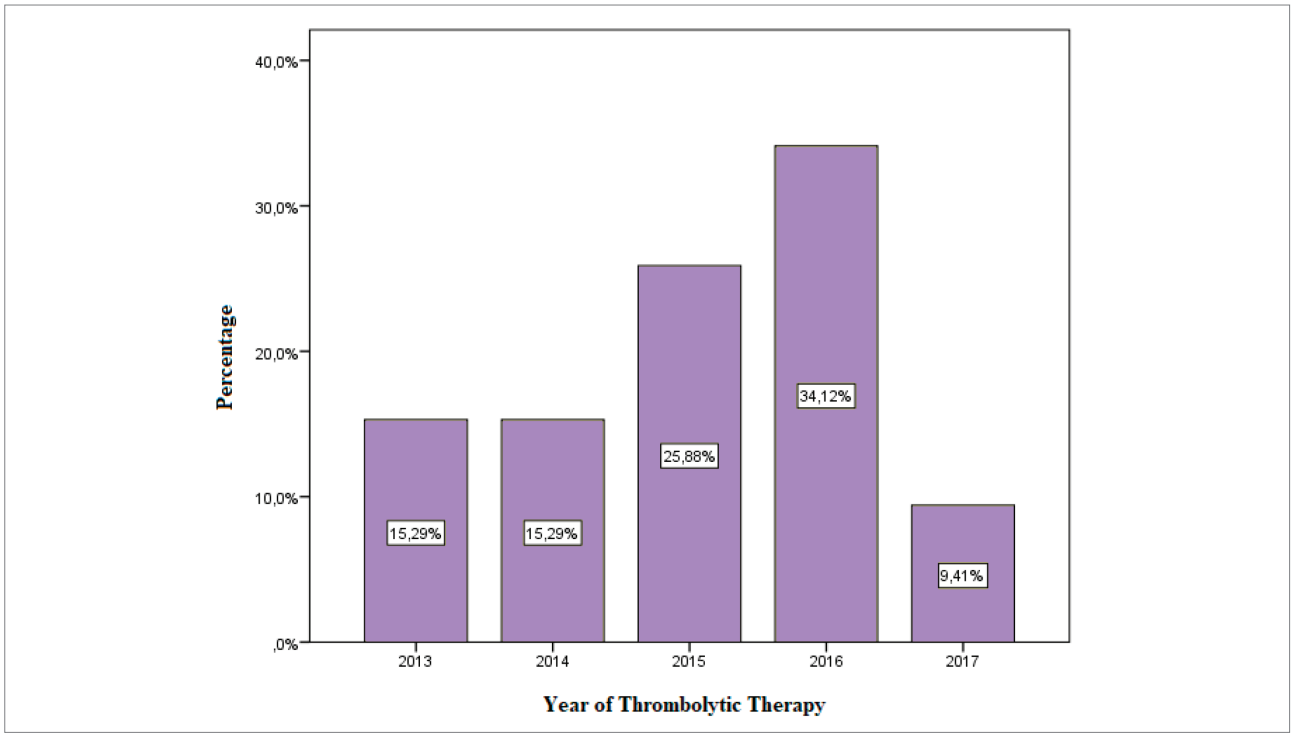
Results

Statistical analysis of electronic forms of 85 nursing lists for patients who were administered thrombolytic therapy determined that the average age of patients is 67.2 years with SD =10.86 years with minimum age 25 and maximum age 87. Gender distribution of respondents is 61.2% of male patients and 38.8% female.

Analysis of the data on the total number of thrombolysis administered throughout the years indicates that 15.3% of thrombolysis was conducted in 2013 and 15.3% in 2014. A rise in the number of thrombolysis administered was noticed in 2015 and 2016. Of the total number of thrombolysis administered, 25.9% was administered in 2015 and as many as 34.1% in 2016. In the first five months of 2017 9.4% of the total number of thrombolysis was administered, as shown in Graph 1.

Table 1 demonstrates a statistical analysis of parameters of patient condition notes during hospitalization, and before thrombolysis, where the highest value $\bar{x}$ was determined for parameters of Walking – Before $\bar{x}$= 3.52, SD = 0.63 and Risk of fall – Before $\bar{x}$=3.49, SD = 0.77. The lowest value $\bar{x}$was determined for GCS/Trauma score scale – Before where $\bar{x}$= 1.59, SD 0.62 and Braden scale – Before where $\bar{x}$= 2.68**,** SD **=** 0.79. Analysis of parameter Strain tolerance – Before determined that 82.4% of patients do not tolerate strain, while 17.6% of patients can tolerate strain. Analysis of parameter Strain tolerance – After determined that 63.5% of patients do not tolerate strain, while 36.5% of patients can tolerate strain. Statistical analysis of parameters of patient condition notes during hospitalization and after thrombolysis the highest value $\bar{x}$ was determined for parameters Hygiene – After where $\bar{x}$= 2.71, SD 1.16; Dressing – After where $\bar{x}$= 2.67, SD = 1.21, Walking – After where $\bar{x}$= 2.67, SD = 1.26. The Lowest value $\bar{x}$was determined for parameters: GCS/Trauma score scale – After where $\bar{x}$= 1.53, SD = 0.72; Braden scale – After, where $\bar{x}$= 2.19, SD = 1.03.

Table 2 demonstrates ranks and test statistics of differences between the first and second measurements of Wilcox test. Negative ranks describe parameter values which at result testing after thrombolysis were lower than parameter values before thromboly-



Graph 1. **The number of thrombolytic therapies administered from January 2013 to May 2017**

Table 1. **Descriptive statistics of patient condition notes parameters**

PARAMETER		N	x̄	SD	Min	Max
Hygiene	Before	85	3.48	0.62	2	4
	After	85	2.71	1.16	1	4
Feeding	Before	85	3.32	0.77	1	4
	After	85	2.52	1.25	1	4
Elimination	Before	85	3.40	0.69	1	4
	After	85	2.60	1.20	1	4
Dressing	Before	85	3.47	0.64	2	4
	After	85	2.67	1.20	1	4
Walking	Before	85	3.52	0.62	2	4
	After	85	2.67	1.25	1	4
Moving	Before	85	3.41	0.71	2	4
	After	85	2.56	1.22	1	4
Sitting	Before	85	3.27	0.86	1	4
	After	85	2.47	1.25	1	4
Standing	Before	85	3.48	0.68	1	4
	After	85	2.62	1.23	1	4
Turning	Before	85	3.28	0.82	1	4
	After	85	2.48	1.25	1	4
Nutrition/ Diet	Before	85	3.24	0.86	1	4
	After	85	2.52	1.23	1	4
Strain tolerance	Before	85	0.18	0.38	0	1
	After	85	0.36	0.48	0	1
Pain	Before	85	0.56	1.68	0	8
	After	85	0.27	1.11	0	6
GCS/ Trauma score scale	Before	85	1.59	0.62	1	4
	After	85	1.53	0.71	1	4
Braden scale	Before	85	2.68	0.79	1	4
	After	85	2.19	1.02	1	4
Risk of fall	Before	85	3.49	0.76	1	4
	After	85	3.67	0.73	1	4
Categorization	Before	85	3.28	0.66	2	4
	After	85	2.53	1.11	1	4

Table 2. **Ranks and test statistics of differences between the first and second measurements of the Wilcox test**

Ranks and test statistics	Hygiene After/Before	Feeding After/Before	Elimination After/Before	Dressing After/Before	Walking After/Before	Moving After/Before	Sitting After/Before	Standing After/Before	Turning After/Before	Nutrition/ Diet After/ Before	Strain tolerance After/Before	Pain After/ Before	GCS/ Trauma score scale After/Before	Braden scale After/Before	Risk of fall After/Before	
Negative ranks	44[a]	44[a]	46[a]	43[a]	43[a]	45[a]	47[a]	44[a]	44[a]	40[a]	4[a]	7[a]	14[a]	30[a]	9[a]	46[a]
Positive ranks	5[b]	5[b]	6[b]	6[b]	5[b]	5[b]	6[b]	6[b]	6[b]	7[b]	20[b]	1[b]	8[b]	3[b]	20[b]	6[b]
Equal ranks	36[c]	36[c]	33[c]	36[c]	37[c]	35[c]	32[c]	35[c]	35[c]	38[c]	61[c]	77[c]	63[c]	52[c]	56[c]	33[c]
Total ranks	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
Arithmetic mean of negative ranks	26.31	26.31	28,00	26.67	26.01	26.89	27.79	27.48	27.07	26.01	12.50	4.43	11.00	17.30	15.17	27.52
Arithmetic mean of positive ranks	13.50	13.50	15.00	13.00	11.50	13.00	20.83	11.00	14.00	12.50	12.50	5.00	12.38	14.00	14.93	18.67
Sum of negative ranks	1157.50	1157.50	1288.00	1147.00	1118.50	1210.00	1306.00	1209.00	1191.00	1040.50	50.00	31.00	154.00	519.00	136.50	1266.00
Sum of positive ranks	67.50	67.50	90.00	78.00	57.50	65.00	125.00	66.00	84.00	87.50	250.00	5.00	99.00	42.00	298.50	112.00
Test statistics: Z	-5.563[d]	-5.563[d]	-5.604[d]	-5.435[d]	-5.545[d]	-5.647[d]	-5.359[d]	-5.636[d]	-5.472[d]	-5.163[d]	-3.266[d]	-1.829[d]	-0.956[d]	-4.395[d]	-1.800[d]	-5.409[d]
Asymp. Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.067	0.339	0.000	0.072	0.000

a. parameter of patient condition notes – After < parameter of patient condition notes – Before
b. parameter of patient condition notes – After > parameter of patient condition notes – Before
c. parameter of patient condition notes – After = parameter of patient condition notes – Before
d. values based on positive ranks

sis. Positive ranks describe parameter values which at result testing after thrombolysis were higher than parameter values before thrombolysis. With a 95% confidence level, a statistically significant difference ($p<0.05$) was found for parameters of hygiene, feeding, elimination, dressing, walking, moving, sitting, standing, turning, nutrition - diet, strain tolerance, Braden scale and categorization, before and after thrombolytic therapy. Statistical significance was not found in the parameters of pain ($p=0.067$), GCS/ Trauma score scale ($p=0.339$), risk of fall ($p=0.072$).

By analysing the categorization of patients before ($\bar{x}=3.28$) and after ($\bar{x}=2.53$) thrombolytic therapy, it has been determined that there has been a decrease in the total categorization of patients, as demonstrated in Table 3.

Discussion

The scientific recommendation of *American Heart Association/ American Stroke Association*: "Scientific reasons for including and excluding criteria for intravenous alteplase in acute ischemic stroke" published in 2015 contains recommendations which additionally clarify the criteria for acceptability of rt-PA (alteplase) therapy in patients with acute ischemic stroke (27, 19).

The major advantage of thrombolysis is the improvement in the final functional outcome through reperfusion and salvation of the endangered tissue. Intracerebral haemorrhaging, which occurs in 6% of patients who have noticed deterioration after the administration of the drug, presents a major risk (28-31). In NINDS studies, the number of combinations of minor and major symptomatic intracerebral haemorrhaging, i.e. any clinical deteriorations which correspond in time with any new intracerebral haemorrhaging 24 to 36 hours after the treatment was 6.4% with rt-PA in relation to 0.6% without rt-PA (30-32). Intracerebral haemorrhaging can be signalled by acute hypertension, headache, neurological deterioration and nausea or vomiting. Other complications may include haemorrhaging from intravenous catheters and locations of earlier vein punctions (in 30% of the cases) (28-30).

Recombined tissue plasminogen activator, rt-PA, is administered in the dose of 0.9 mg/ kg of body mass, of which 10% initially as intravenous bolus and then the rest in a continued intravenous infusion in the course of one hour. Maximum drug dosage is 90 mg. Thrombolytic therapy has been used in the world for 20 years. At „Dr. Ivo Pedišić" General Hospital, thrombolytic therapy has been used since 2012, when only one patient was administered the therapy. This study determined that the administration of thrombolytic therapy is on the rise year after year. In 2013 and 2014 there were only 13 thrombolytic therapies, in 2015 22 thrombolytic therapies were administered and in 2016 as many as 29. The study also

Table 3. **Categorization of patients before and after thrombolytic therapy**

Time	Category	N	%	$\bar{x}$	SD
Categorization - Before	1	0	0		
	2	10	11.8		
	3	41	48.2		
	4	34	40.0		
	Total	85	100.0	3.28	0.67
Categorization – After	1	18	21.2		
	2	28	32.9		
	3	15	17.6		
	4	24	28.2		
	Total	85	100.0	2.53	1.12

included the first five months of 2017 where thrombolytic therapy was administered to 8 patients. The average age of the patients who were administered thrombolytic therapy is 67.24 with standard deviation of 10.865 years. Minimum age is 25 and maximum age is 87. As regards gender distribution, there are 61.2% of male and 38.8 % of female patients.

As already mentioned, the study was conducted by insight into nursing documentation in the electronic form – comparison of patient condition notes before and after thrombolytic therapy. The following parameters were monitored: hygiene, feeding, elimination, dressing, walking, moving, sitting, standing, turning, nutrition - diet, strain tolerance, Glasgow coma scale (GCS)/Trauma score scale, Braden scale, risk of fall and total categorization. In order to establish potential differences among these parameters, Wilcox test was used, which confirmed a statistically relevant difference in almost all parameters of patient condition notes. By analysing categorization of patients, it is evident that before the administration of therapy 10 patients belonged to category II (11.8%), 41 patients to category III (48.21%) and 34 patients to category IV (40%). After the administration of thrombolytic therapy, an improvement is evident with: 18 patients in category I (21.2%), 28 patients in category II (32.9%), 15 patients in category III (17.6%), and 24 patients in category IV (28.2%). When searching the PubMed database for keywords *nursing, documentation, outcomes* and *thrombolysis,* not a single study was found which used data from nursing documentation, as did the study at hand. Grabowska and associates carried out a year-long prospective study which used different scales for the assessment of care outcomes and determined better outcomes of patient care and consequently a better quality of life after thrombolytic treatment. Throughout the course of one year 53 participants were assessed for NIHSS, Barthel index and quality of life scale for stroke patients. Beneficial outcomes after thrombolytic treatment were determined in all three scales. At hospital admission, 83 % of all patients had serious or moderate neurological damage. 74% reported acceptable level of quality of life three months after thrombolytic treatment and 79% 12 months after. The neurological status has been significantly improved with the most relevant changes during hospitalization – after thrombolytic treatment and in the first three months after discharge (31). Catangui claims that nurses play a vital role in early detection of deterioration in patients' conditions, especially in recognizing harmful consequences of thrombolytic treatment (32). Nurses involved in the care of acute stroke patients must have ongoing education. The purpose of education is the development of skills required to treat patients who have suffered a stroke and expansion of knowledge in line with the latest medical developments for all types of stroke (33). Baatiema and associates conducted a study based on a systematic overview of databases MEDLINE, CINAHL, Embase, PsycINFO, Cochrane and AMED from 1990 to 2016 and established the main obstacles in the application of scientifically grounded care treatments in instances of acute stroke. Respondents in ten studies found in those databases were clinical healthcare workers in wards and units for acute stroke care. Result analysis established the major obstacles, namely poor work organization, limitations as regards staff competences, low level of awareness and knowledge of the effects of the scientifically founded administration of thrombolytic therapy, as well as inadequate support among healthcare staff (34). Active and effective nursing interventions in the first hours of acute stroke bring about an increase in therapy efficiency, i.e. recovery and rehabilitation. Catangui and Roberts's study established that nurses are vital for a successful thrombolytic treatment, as they ease, facilitate, supervise and anticipate the course of thrombolytic treatment. They also claim that factors such as communication, teamwork, making clinical decisions, education and security affect and contribute to the success of thrombolytic treatment (35).

The implementation of the healthcare process, continued monitoring of the patient's condition and progress, as well as validation of nursing activities provide an imperative for the application of nursing documentation as an essential tool in describing regular nursing activities. Application of documentation enables a more permanent insight into a patient's general condition, data availability, care continuity, progress chronology and result evaluation, as well as a material background for professional, expert and scientific development of nurses through studies in the field of nursing.

The major limitation of this study was the time of data collected after the administered thrombolytic therapy. More precisely, the study considered relevant only the data entered into the electronic nursing documentation immediately before patients' discharge irrelevant of the duration of their hospital stay. Furthermore, an-

other limitation is the technical setup of the electronic nursing documentation, which, when entering data, records the current time of entering data in the system, and not the real time of administering treatments and procedures, meaning that the time difference may be up to a couple of hours.

Conclusion

Contemporary therapy for acute ischaemic stroke includes intravenously administered thrombolytic therapy – recombined tissue plasminogen activator, but only within the first 180 i.e. 270 minutes of the stroke and insofar as NIHSS criteria are met. The objective of thrombolytic therapy is to re-establish circulation, i.e. reperfusion of the ischaemic area.

Nursing documentation is a set of data which serves for the purpose of quality control of planned and administered nursing care and is an integral part of the medical documentation of each patient. Nurses document every treatment from the field of healthcare and thus ensure the best possible outcome of nursing care for patients. As previously mentioned, time is a crucial factor when administering thrombolytic therapy. Prompt reaction and administering rt-PA within the recommended timeframe ensure a better outcome of patient care in total. Hence, nurses' interventions are vital and indispensable; they are aimed at quick assessment, high-quality organization within a multidisciplinary team and patient preparation for therapy, as well as adequate care after the administered thrombolytic therapy.

The study carried out established that there is a statistically relevant difference in care outcomes for patients after the administered thrombolytic therapy in relation to the time before thrombolytic therapy, in the following parameters of progress notes on patients' conditions: hygiene, feeding, elimination, dressing, walking, moving, sitting, standing, turning, nutrition - diet, strain tolerance, Braden scale and categorization.

Nurses involved in care of acute stroke patients must have ongoing education. The purpose of the education is the development of skills required to treat patients who have suffered a stroke and expansion of knowledge in line with the latest medical developments for all types of stroke. New challenges are a good formal, but also lifelong education, as well as scientific research which must be grounded in evidence.

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EVALUACIJA ISHODA SESTRINSKE SKRBI BOLESNIKA NAKON POSTUPKA TROMBOLIZE – RETROSPEKTIVNA STUDIJA

Sažetak

Uvod. Sestrinska dokumentacija pokazatelj je kvalitete zdravstvene njege. Analizom podataka, sestrinska dokumentacija postaje alat u procjeni i promjeni kliničke prakse. Moždani udar najveći je pojedinačni uzrok invaliditeta kod odrasle populacije. Kod ishemijskoga moždanog udara dolazi do naglog prekida moždane cirkulacije. Uzroci prekida cirkulacije mogu biti začepljenje ili suženje krvne žile uzrokovane trombozom, embolijom ili sustavnom hipoperfuzijom. U praksi se primjenjuje terapija za akutni ishemijski moždani udar koja uključuje intravensku primjenu trombolitičke terapije – rekombiniranoga tkivnog aktivatora plazminogena unutar prvih 180 odnosno 270 minuta od nastanka moždanog udara.

Cilj. Utvrditi ishode skrbi bolesnika nakon primjene trombolitičke terapije prikazom sažetka praćenja stanja bolesnika tijekom hospitalizacije, a u vremenu prije i nakon primijenjene trombolize.

Metode. Retrospektivna studija provedena je na odjelu neurologije u Općoj bolnici „Dr. Ivo Pedišić" u Sisku kroz 43 mjeseca u periodu od 1. siječnja 2013. do 31. svibnja 2017. U provedenoj studiji sudjelovalo je 85 ispitanika. Podaci su prikupljeni na temelju sastavnice sestrinske dokumentacije u elektroničkom obliku: sažetka praćenja stanja bolesnika.

Rezultati. S razinom pouzdanosti od 95 % utvrđena je statistički značajna razlika ($p < 0,05$) kod parametara higijene, hranjenja, eliminacije, oblačenja, hodanja, premještanja, sjedanja, stajanja, okretanja, prehrane – dijete, podnošenja napora, Bradenove skale i kategorizacije, a prije i poslije trombolize. Statistička značajnost nije utvrđena kod parametara bol ($p = 0,067$), GCS / Trauma score ljestvice ($p = 0,339$) i rizik za pad ($p = 0,072$).

Zaključak. Primjena procesa zdravstvene njege, kontinuirano praćenje stanja bolesnika, ali i vrednovanje sestrinskog rada daje imperativ primjeni sestrinske dokumentacije kao važnom alatu za opis sestrinske prakse. Primjena dokumentacije omogućuje trajni uvid u stanje bolesnika, dostupnost podataka, kontinuitet skrbi, kronološki pregled i evaluaciju rezultata, kao i materijalnu podlogu za profesionalni, stručni i znanstveni razvoj medicinskih sestara kroz istraživanja u sestrinstvu.

Ključne riječi: sestrinstvo, dokumentacija, ishodi, tromboliza

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Quality of Life of Nurses in Osijek

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Abstract

Introduction. The nurse is the one who will be with patients, listen to them, talk to them, provide security, and focus their attention on them. The nurse is unique. The World Health Organisation defines quality of life as the perception of the role of the individual in the context of culture and values in which he lives and in relation to his goals, expectations, standards and concerns.

Aim. To examine the quality of life of nurses in the Clinical Hospital Center Osijek and Health center Osijek.

Study design. A cross-sectional study.

Methods. The study includes the total of 117 nurses, 64 of whom work in the Clinical Hospital Centre in Osijek and 53 are employed in primary health care. The World Health Organization Quality of Life Questionnaire is used in the study. Demographic characteristics are examined in the first part of the questionnaire, and in the second part of the questionnaire participants were asked questions that are related to the quality of their lifestyle.

Results. Nurses rated their quality of life as good (45.3 %), also, they are satisfied with their health (59.8 %). Respondents in the age group from 22 to 32 are most satisfied with the domain "Social relations" with the arithmetic mean of 63,06 and *p* value 0.048. All three questions from the domain "Social relationship of nurses" had high arithmetic means which were over 3.60.

Conclusion. Quality of life of nurses is at a good level. Younger respondents have a better quality of life. Respondents are most satisfied with their own agility and meaning of their lives, while they are most dissatisfied with their financial situation and opportunities for recreation.

Introduction

"The unique function of the nurse is to assist the individual, sick or well, in the performance of those activities contributing to health or its recovery (or to peaceful death) that he would perform unaided if he had the necessary strength, will or knowledge. And to do this in such a way as to help him gain independence as rapidly as possible" (1).

Each member of the medical team is bound to help the patient to regain independence, but a nurse is a person who spends most time with them while there is no necessary strength, will or knowledge. It is important to point out that a nurse has independence in nursing care and adequately takes care of the patient and that is why there is a chance to observe each patient and perceive their needs, notice potential problems and help the patient to solve them in order to have fast recovery. A nurse is more than a person who assists the patient in the recovery, it is their spokesman. A nurse realizes that the patient has difficulty expressing needs and feelings and, just like a mother, intercedes for them, speaks for them, because a nurse knows what the patient wants. Because they provide the necessary care, a nurse has the opportunity to advise the patient, encourage positive habits and warn about the bad ones. The nurse is the one who will be with them, listen to them, talk to them, provide security, and focus their attention on them. The nurse is unique.

Definition of quality of life

The World Health Organisation defines quality of life as the perception of the role of the individual in the context of culture and values in which he lives and in relation to his goals, expectations, standards and concerns (2). International Wellbeing Group defines quality of life as a multidimensional construct that comprises the standard of living, health, productivity, the possibility of achieving close contact, security, belonging to a community and a sense of security in the future (3).

Quality of life indicators

Quality of life includes both an objective and a subjective component. The subjective component of quality of life includes seven areas: material well-being, emotional well-being, health, productivity, intimacy, safety and community. Objective indicators of quality of life are: income, availability of health services, the availability of different services, numeric indicators of employment and others. It has been shown that subjective well-being has a more important role in determining the overall welfare over objective indicators (4).

Vuletić (4) considers quality of life as well-being affected by objective indicators, a large proportion has a subjective perception and evaluation of physical, material, social and emotional well-being, personal development and purposeful activity. One of the important indicators of quality of life is health. Health is defined as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (5).

The aim of the research study was to examine the quality of life of nurses in the Clinical Hospital Center Osijek and Health center Osijek.

Methods

This study was cross-sectional. The study was conducted during 2015 and included the total of 117 nurses, of which 64 respondents were from the Clinical Hospital Centre Osijek, and 53 of them worked at the primary health care at the Health center Osijek. The World Health Organization Quality of Life Questionnaire (WHOQOL - BREF (1998.)) was used in the study. It is a short version of the WHOQOL-100 questionnaire. WHOQOL-BREF consists of 26 questions. In each of these questions, respondents answered on Likert scale (1-5). There are four domains: physical health, psychological health, social relationship and environment (6).

In the Clinical Hospital Center Osijek research was conducted at 5 clinics: Department of Internal Medicine (20.3 %), Department of Psychiatry (4.7 %), Department of Pediatrics (20.3 %), Department of Surgery (29.7 %) and Department of Neurology (25 %). The total number of respondents was 112 females and 5 males.

The average age of respondents was 40.56 years with a standard deviation of 11.73 years. The age range of respondents was from 22 to 64.

The data set was subject to statistical anysis using SPSS (Version 16.0). Categorical data were presented in absolute and relative frequencies. Numerical data were described as mean and standard deviation. The connection of normally distributed numerical variables was evaluated by Pearson correlation coefficient r. All *p* values are two-sided. The level of significance was set at alpha < 0.05.

Ethical Considerations

Ethical permission was sought and gained for the study through the local Ethics Committee and the University Committee, copies of which have been retained for inspection.

Results

Of the total number of respondents, 29.9 % of the respondents have no children, 19.7 % of the respondents have one child, 44.4 % of the respondents have two children, while 6 % of the respondents have three children. 71 % of the respondents live in urban areas, 29 % in rural areas. Most of the repondents live in a house or a flat (76.1 %).

Of all respondents, 72 respondents or 61.6 % have secondary education, 41 respondents (35 %) have a Bachelor of Science in Nursing, and 4 respondents (3.4 %) have a Master of Science in Nursing. Most of the respondents work in shifts (39 %), 12/24/12/48 type of work (33 %), other type of work (28 %).

Nurses rated their quality of life as good (45.3 %) and neither poor nor good (31.6 %). Also, they are satisfied with their health (59.8 %) (Table 1).

In the subscale "Physical health", nurses need a little (40.2 %) and a moderate amount of medical treatment to function in their daily life (36.8 %), followed by the lowest arithmetic mean of 1.88. Most of the nurses think that they are very much able to get around (47 %) confirmed by the highest arithmetic mean of 4.15. Also, most of them are satisfied with the ablility to perform their activities of daily living (48.7 %) and they are satisfied with their capacity for work (55.6 %) (Table 2).

The highest arihtmetic mean for the domain "Mental health of nurses" was 4.15 for the question about the meaning of their life. The lowest arihtmetic mean was 2.45 for the question about experiencing negative feelings (Table 3).

Results show that nurses are satisfied with their social relationships. All three questions about social relationship of nurses had high arithmetic means which were over 3.6 (Table 4).

Table 1. **Self-assessment of quality of life and health satisfaction**

		Number	Percentage (%)	Arithmetic mean	Standard deviation
How would you rate your quality of life?	Very poor	2	1.7		
	Poor	4	3.4		
	Neither poor nor good	37	31.6		
	Good	53	45.3		
	Very good	21	17.9		
	Total	117	100	3.74	0.85
How satisfied are you with your health?	Very dissatisfied	0	0.0		
	Dissatisfied	9	7.7		
	Neither satisfied nor dissatisfied	17	14.5		
	Satisfied	70	59.8		
	Very satisfied	21	17.9		
	Total	117	100	3.88	0.79

Table 2. **Physical health of nurses**

		Number	Percentage (%)	Arithmetic mean	Standard deviation
To what extent do you feel that physical pain prevents you from doing what you need to do?	Not at all	46	39.3		
	A little	34	29.1		
	A moderate amount	26	22.2		
	Very much	9	7.7		
	An extreme amount	2	1.7		
	Total	117	100	2.03	1.04
How much do you need any medical treatment to function in your daily life?	Not at all	2	1.7		
	A little	47	40.2		
	A moderate amount	43	36.8		
	Very much	14	12		
	An extreme amount	10	8.5		
	Not at all	1	0.9		
	Total	117	100	**1.88**	1.00
Do you have enough energy for everyday life?	No answer	3	2.6		
	Not at all	1	0.9		
	A little	7	6		
	Moderately	39	33.3		
	Mostly	51	43.6		
	Completely	16	13.7		
	Total	117	100	3.56	1.00
How well are you able to get around?	No answer	2	1.7		
	Very poor	1	0.9		
	Poor	5	4.3		
	Neither poor nor good	16	13.7		
	Good	38	32.5		
	Very good	55	47		
	Total	117	100	**4.15**	1.06
How satisfied are you with your sleep?	No answer	2	1.7		
	Very dissatisfied	7	6		
	Dissatisfied	16	13.7		
	Neither satisfied nor dissatisfied	24	20.5		
	Satisfied	45	38.5		
	Very satisfied	23	19.7		
	Total	117	100	3.47	1.22
How satisfied are you with your ability to perform your daily living activities?	No answer	2	1.7		
	Very dissatisfied	1	0.9		
	Dissatisfied	7	6		
	Neither satisfied nor dissatisfied	27	23.1		
	Satisfied	57	48.7		
	Very satisfied	23	19.7		
	Total	117	100	3.75	0.98
How satisfied are you with your capacity for work?	No answer	2	1.7		
	Very dissatisfied	0	0		
	Dissatisfied	3	2.6		
	Neither satisfied nor dissatisfied	16	13.7		
	Satisfied	65	55.6		
	Very satisfied	31	26.5		
	Total	117	100	4.01	0.89

Table 3. **Mental health of nurses**

		Number	Percentage (%)	Arithmetic mean	Standard deviation
How much do you enjoy life?	No answer	8	6.8		
	Not at all	2	1.7		
	A little	6	5.1		
	A moderate amount	34	29.1		
	Very much	51	43.6		
	An extreme amount	16	13.7		
	Total	117	100	3.42	1.25
To what extent do you feel your life to be meaningful?	No answer	0	0		
	Not at all	4	3.4		
	A little	17	14.5		
	A moderate amount	53	45.3		
	Very much	43	36.8		
	Total	117	100	**4.15**	.79
How well are you able to concentrate?	Not at all	1	0.9		
	A little	4	3.4		
	A moderate amount	25	21.4		
	Very much	63	53.8		
	Extremely	24	20.5		
	Total	117	100	3.90	0.79
How satisfied are you with yourself?	No answer	1	0.9		
	Very dissatisfied	1	0.9		
	Dissatisfied	2	1.7		
	Neither satisfied nor dissatisfied	22	18.8		
	Satisfied	66	56.4		
	Very satisfied	25	21.4		
	Total	117	100	3.93	0.83
How often do you have negative feelings such as blue mood, despair, anxiety, depression?	No answer	4	3.4		
	Never	2	1.7		
	Seldom	60	51.3		
	Quite often	39	33.3		
	Very often	12	10.3		
	Always	0	0		
	Total	117	100	**2.45**	0.84

Table 4. **Social relationship of nurses**

		Number	Percentage (%)	Arithmetic mean	Standard deviation
How satisfied are you with your personal relationships?	No answer	1	0.9		
	Very dissatisfied	0	0		
	Dissatisfied	4	3.4		
	Neither satisfied nor dissatisfied	19	16.2		
	Satisfied	65	55.6		
	Very satisfied	28	23.9		
	Total	117	100	**3.97**	0.82
How satisfied are you with your sex life?	No answer	5	4.3		
	Very dissatisfied	4	3.4		
	Dissatisfied	5	4.3		
	Neither satisfied nor dissatisfied	33	28.2		
	Satisfied	42	35.9		
	Very satisfied	28	23.9		
	Total	117	100	**3.6**	1.24
How satisfied are you with the support you get from your friends?	No answer	1	0.9		
	Very dissatisfied	0	0		
	Dissatisfied	6	5.1		
	Neither satisfied nor dissatisfied	21	17.9		
	Satisfied	71	60.7		
	Very satisfied	18	15.4		
	Total	117	100	**3.84**	0.81

Nurses are most dissatisfied with the amount of money they have and the opportunity for recreation, which has been confirmed with the arithmetic means of 3.12 and 3.19. They are most satisfied with the possibility of obtaining good medical care (arithmetic mean 4.00) (Table 5).

Table 5. **Environment**

		Number	Percentage (%)	Arithmetic mean	Standard deviation
How safe do you feel in your daily life?	Not at all	3	2.6		
	A little	3	2.6		
	A moderate amount	34	29.1		
	Very much	55	47		
	Extremely	22	18.8		
	Total	117	100	3.77	0.87
How healthy is your physical environment?	Not at all	5	4.3		
	Slightly	5	4.3		
	Moderately	61	52.1		
	Very	40	34.2		
	Extremely	6	5.1		
	Total	117	100	3.32	0.82

Table 5. **Environment**

		Number	Percentage (%)	Arithmetic mean	Standard deviation
Have you enough money to meet your needs?	No answer	2	1.7		
	Not at all	10	8.5		
	A little	14	12		
	Moderately	45	38.5		
	Mostly	38	32.5		
	Completely	8	6.8		
	Total	117	100	**3.12**	1.10
How available to you is the information that you need in your day-to-day life?	No answer	2	1.7		
	Not at all	1	0.9		
	A little	3	2.6		
	Moderately	19	16.2		
	Mostly	67	57.3		
	Completely	25	21.4		
	Total	117	100	3.91	0.91
To what extent do you have the opportunity for recreation?	No answer	2	1.7		
	Not at all	10	8.5		
	A little	17	14.5		
	Moderately	40	34.2		
	Mostly	31	26.5		
	Completely	17	14.5		
	Total	117	100	**3.19**	1.21
How satisfied are you with the conditions of your living place?	No answer	1	0.9		
	Very dissatisfied	1	0.9		
	Dissatisfied	3	2.6		
	Neither satisfied nor dissatisfied	24	20.5		
	Satisfied	51	43.6		
	Very satisfied	37	31.6		
	Total	117	100	**4.00**	0.92
How easily are you able to get good medical care?	No answer	3	2.6		
	Slightly	1	0.9		
	Moderately	7	6		
	Very	37	31.6		
	Extremely	49	41.9		
	Not at all	20	17.1		
	Total	117	100	3.61	1.03
How satisfied are you with your transport?	No answer	1	0.9		
	Very dissatisfied	1	0.9		
	Dissatisfied	9	7.7		
	Neither satisfied nor dissatisfied	15	12.8		
	Satisfied	54	46.2		
	Very satisfied	37	31.6		
	Total	117	100	3.97	0.99

Results in all subscales had significant positive correlations. The biggest correlation was observed in the variables mental health and social relations (p = 0.651) and in the variable psychological health and environment (r = 0.752). Respondents which were more satisfied with social relations assesed their mental health better. Respondents with better mental health were more satisfied with their environment (Table 6).

From table we can see that respondents in age group from 22 to 32 had the best answers in the most of the observed domains. They are most satisfied with the domain "Social relations" with the arithmetic mean of 63.06 and p value 0.048 (Table 7).

Discussion

Overall, the respondents in this survey gave a pretty good assessment of the overall quality of life. We can conclude that the respondents' self-assessment area quality of life and health satisfaction gave an average grade of 3.74.

One of the studies showed that the most important indicator of the quality of life is satisfaction with personal achievements (7). A survey conducted in Croatia on 1048 respondents showed that general satisfaction with life is significantly associated with the satisfaction with health (7). Australian psychologist Cummins in a systematic review of the literature in the area of Western Europe, North America and Australia analyzed the distribution of self-assessment of life satisfaction of the adult population and concluded that the average life satisfaction level of 75% ± scale maximum. This indicates the high level of satisfaction (8). The WHO study shows that the impact of mental disorders on quality of life equals to or is even greater than the impact of chronic diseases, such as arthritis, diabetes, heart, lung and neurological diseases. Personality is also one of the most important indicators of quality of life (5, 6).

In this study, a significant positive indicator is young age. The assumption was that younger nurses have better social relations. Research has shown that social interaction reduces with age (9). This research showed that people who are between 22 and 32 years old give much higher grades than older people. According to groups, younger people are significantly more satisfied with social relations.

In the domain of "Physical health" respondents were most satisfied with the possibility of moving around and their ability to work. The average grade for the domain mental health is very good. Respondents were most satisfied with the meaning of their own

Table 6. **Pearson's correlation coefficient**

		Quality of life and satisfaction with health	Physical health	Psychological health	Social relations	Environment
Quality of life and satisfaction with health	r	1	0.474**	0.649**	0.542**	0.654**
	p		0.000	0.000	0.000	0.000
	N	117	113	104	112	113
Physical health	r	0.474**	1	0.568**	0.543**	0.630**
	p	0.000		0.000	0.000	0.000
	N	113	113	102	109	111
Psychological health	r	0.649**	0.568**	1	0.651**	0.752**
	p	0.000	0.000		0.000	0.000
	N	104	102	104	100	102
Social relations	r	0.542**	0.543**	0.651**	1	0.608**
	p	0.000	0.000	0.000		0.000
	N	112	109	100	112	110

**Correlation is significant at the 0.01 level (2-tailed).

Table 7. **Testing the significance of differences in the observed domains according to age categories**

	Age categories	N	Arithmetic mean of ranks	*p* value
Quality of life and satisfaction with health	22 – 32	36	62.47	0.361
	33-43	29	51.72	
	44 - 54	28	50.27	
	55 and more	18	58.86	
	Total	111		
Physical health	22 – 32	35	53.19	0.387
	33-43	28	46.66	
	44 - 54	26	58.02	
	55 and more	18	61.19	
	Total	107		
Psychological health	22 – 32	34	57.03	0.072
	33-43	26	48.19	
	44 - 54	23	37.80	
	55 and more	16	55.53	
	Total	99		
Social relations	22 – 32	33	63.06	0.048
	33-43	29	54.24	
	44 - 54	27	41.15	
	55 and more	18	56.28	
	Total	107		
Environment	22 – 32	35	54.03	0.420
	33-43	28	50.27	
	44 - 54	26	50.65	
	55 and more	18	64.58	
	Total	107		

*Chi-square test

life. Respondents were very satisfied with all three aspects in "Social relationship" domain, relationship with loved ones, sex life and support from friends.

In the area "Environment" the respondents are satisfied with the housing conditions. Respondents were least satisfied with the financial situation and opportunities for recreation. Most of the nurses said that they are not involved in regular exercise because they do not have time, are tired or do not have access to sports facilities. Other research recommends organizing team-building to live a healthy lifestyle (10).

When examining relations between the observed attitudes of respondents it can be concluded that there is a significant correlation between satisfaction with environment and mental health and that there is also a correlation between satisfaction with mental health and social relationships.

The study relied on self-assessment of the quality of life of nurses, which could lead to subjective results. Further research in this area should take into account the objective methods, such as medical records, to determine the physical health. Nursing requires accuracy, precision, warmth, responsibility and the highest professionalism and expertise, and to do all the necessary interventions to carry out further research on the impact of shift work, work in shifts at their both professional and personal life. This study is only a small contribution to that.

Conclusion

According to the results of the conducted research it can be concluded:

- Quality of life of nurses is at a good level
- Most of the nurses are satisfied with their health
- Younger nurses are more satisfied with social relationships.
- Respondents are most satisfied with their own agility and meaning of their lives, while they are most dissatisfied with their financial situation and opportunities for recreation.

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KVALITETA ŽIVOTA MEDICINSKIH SESTARA U OSIJEKU

Sažetak

Uvod. Medicinska je sestra ta koja će biti uz pacijenta, poslušati ga, razgovarati, pružiti osjećaj sigurnosti i usmjeravati svu svoju pažnju na njega. Medicinska je sestra jedinstvena. Svjetska zdravstvena organizacija definirala je kvalitetu života kao percepciju uloge pojedinca u kontekstu kulture i vrijednosti u kojima živi te u odnosu na njegove ciljeve, očekivanja, standarde i brige.

Cilj. Ispitati kvalitetu života medicinskih sestara u Kliničkom bolničkom centru Osijek i Domu zdravlja Osijek.

Nacrt studije. Presječna studija.

Metode. U ispitivanje je bilo uključeno ukupno 117 medicinskih sestara/tehničara, od čega je 64 ispitanika bilo iz Kliničkog bolničkog centra (KBC) Osijek, a 53 iz primarne zdravstvene zaštite Doma zdravlja Osijek. U istraživanju se kao instrument ispitivanja primijenio anketni upitnik Anketa svjetske zdravstvene organizacije o kvaliteti života.

Rezultati. Medicinske sestre ocijenile su svoju kvalitetu života dobrom (45,3 %), a također su zadovoljne i svojim zdravljem (59,8 %). Ispitanici u dobnoj skupini od 22 do 32 najzadovoljniji su domenom „Socijalni odnosi" s aritmetičkom sredinom od 63,06 uz vrijednost p = 0,048. Sva tri pitanja iz domene „Socijalni odnosi" imala su visoku aritmetičku sredinu, koja je iznosila više od 3,60.

Zaključak. Kvaliteta života medicinskih sestara na dobroj je razini. Mlađi ispitanici imaju bolju kvalitetu života. Ispitanici su najzadovoljniji vlastitom agilnošću i značenjem svojih života, dok su najnezadovoljniji financijskom situacijom i mogućnostima za rekreaciju.

Ključne riječi: kvaliteta života, smjenski rad, medicinska sestra

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The Role of Deep Brain Stimulation Procedure on the Quality of Life in Patients with Parkinson's Disease

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Abstract

Introduction. Deep Brain Stimulation (DBS) is an electrical stimulation of the individual cells of the central nervous system. DBS is today most often used to treat movement disorders such as Parkinson's disease, dystonia, Tourette syndrome etc. The goal of DBS is improving the quality of life of patients, specifically by improving their motor function, reduction in drug therapy they use as well as reducing pain and neurological deficits.

Methods. We analyzed the quality of life pre- and post-operatively in 95 patients with DBS implantations. The patients were operated on at the Department of Neurosurgery of the University Hospital Dubrava in Zagreb for treating Parkinson's disease. The patients which were included were operated on from 2007-2015. All patients underwent this highly specialized procedure that consists of implanting electrodes in the subthalamic nuclei (STN) as well as extension and battery implantation.

Results. Four characteristics were analyzed: the patient's ability to clothe, eat and walk independently without assistance as well as their overall satisfaction with the quality of life after the procedure. After the onset of the stimulation, improvement wwas seen in all of the observed parameters.

Conclusion. This kind of procedure has been shown to be justified in treating Parkinson's disease symptoms and improving the quality of life and independence in these patients.

Introduction

Stimulation stands for excitation, arousal or activation. There are a couple of ways for brain stimulation. Best known non-invasive techniques are medication induced ones and magnetic stimulation via electrical devices (1). The brain is an electrochemical organ and brain activity controls our physical balance as well as our life. Brain waves are responsible for our way of thinking and how we respond to our surroundings, although there are conditions where this balance is damaged and those conditions require a change in certain brain activities. Deep Brain Stimulation (DBS) is an innovative surgical treatment which provides a precise way of electrical stimulation to certain groups of brain cells and centers (2). First DBS implantation was performed in the 1980s in France. In the USA, DBS has become a routine procedure in 250 medical centers where 125 000 patients were treated. In 1993. this procedure was approved in Europe. In the Republic of Croatia, it has been conducted since the year 2000. University hospital Dubrava is unique for its application in this part of Europe.

DBS gives hope to those affected by progressive, neurodegenerative and disempowering diseases which are the reason for their social and psychological isolation. The best results in DBS are achieved in treating the so-called motor symptoms, namely tremor, rigor and difficulties in walking (freezing, festinations) which affects the quality of life of these patients greatly. The aim of this study was to compare the quality of life in 95 patients suffering from Parkinson's disease pre- and post-operatively, more specifically, before and after the DBS stimulation of their STN. Namely, we assessed their ability to walk, eat and clothe without assistance as well as their overall subjective impression of their quality of life.

Methods

We analyzed 95 patients with DBS implantations which were performed in the Department of Neurosurgery at the University Hospital Dubrava for treating Parkinson's Disease from 2007 till 2015. In this period over 200 patients were operated on, but these 95 were the ones which were analyzed by our nursing staff regarding their quality of life and independence in their everyday life. 36 female and 59 male patients were analyzed. Patients were asked to fill a questionnaire in which they were asked to assess their ability to clothe independently. They were provided with three possible answers: "I don't need assistance", "I sometimes need assistance" and "I always need assistance". The same answers were offered in order to assess their ability to walk and eat independently. They were also asked to rate their subjective independence in doing everyday tasks, being offered possible answers of "Independent", "Somewhat independent" and "Relying heavily on other people's help". They were questioned both before and after surgery (before and after the onset of the stimulation).

Compliance with Ethical Standards

Patients have given informed consent for participation in this paper.

The DBS procedure at our hospital is as follows. After a patient is accepted as a candidate for the DBS treatment he is admitted at the Department of neurosurgery for further surgical planning. DBS procedure contain several steps. The first step is a special MRI scan, using a special T2 sequence necessary for visualization of the subthalamic nuclei (STN) detailed neurosurgical planning. Immediately before the procedure Leksell's frame (Figure 1) is placed on the patient's head in order to put the head and brain in the 3D system. The frame is positioned by the doctor with a help of two nurses. Afterwards, computerized tomography (CT) is scanned and the patient is transferred to the operating room for further planning. In the meantime, a technician or a nurse prepares the device for neurosurgical planning (Stealth Station S7, Medtronic), electrodes for implantation, impedance measuring device Elekta and other instruments necessary for the surgery. MRI and CT image are being uploaded to Stealth Station S7 (Figure 2) and the neurosurgeon is using both scans for planning trajectory and target, STN (Figure 3). Leksell frame electrode entry point is determined using X, Y and Z plane. Then, surgical preparation of the operating field (washing and covering) is performed. The patient is under local anesthesia. After the incision, trepanation and opening of the dura the electrode is placed, first left then right or the other way around.

Impedance is measured during surgery to avoid complications and to make sure that the electrode is in the correct position. After the implantation, control CT is made to establish the position of the electrodes.

Figure 1. **Setting the Leksell frame in local anesthesia**

Figure 2. **Device for DBS planning, StealthStation S7**

If the position is correct and there are no signs of complications the second part of the surgery starts. The second part is performed in general endotracheal anesthesia. It consists of extension placement and connecting the electrode to the battery (Activa PC). The battery is placed subcutaneously in the left pectoral region. The stimulation starts on the 3rd day after surgery and at that moment the patient usually experiences instant improvement.

Results

Ninety-five patients were examined before and after the beginning of stimulation.

Four graphs in Figure 4 show the results our patients reported on preoperatively. In assessing their walking ability, 20 patients noted that they always needed assistance, 57 of them noted how they sometimes need assistance, while 5 patients reported never having the need for assistance. For eating the results were as follows: 8 patients always needed assistance, 67 sometimes and 20 patients never needed assistance. In their assessment of their ability to clothe independently, 16 patients noted always needing assistance, 53 sometimes, while 26 patients

Figure 3. **Target and trajectory planning on STN bilaterally as a part of DBS preparation**

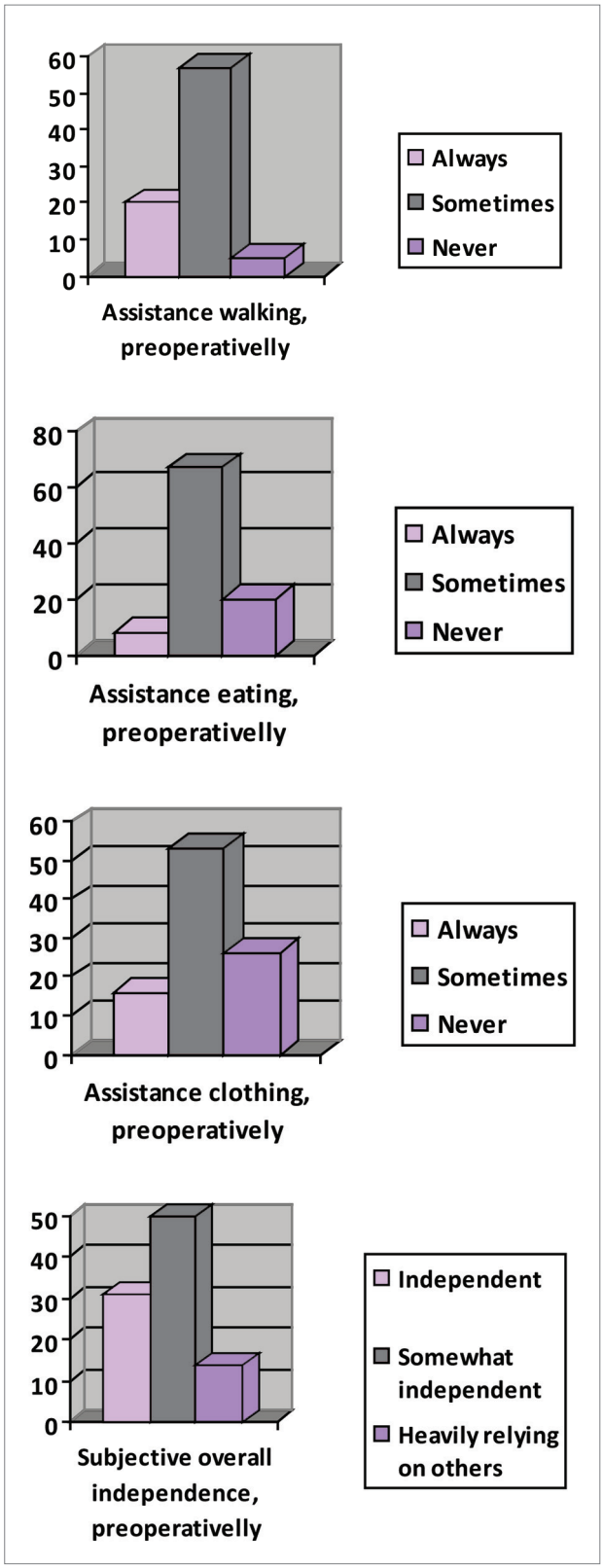

Figure 4. **Preoperative assessment of patient's quality of life**

Figure 5. **Postoperative assessment of patient's quality of life**

noted how they never needed assistance. Finally, 31 patients reported their subjective feeling of their own independence in doing everyday tasks as "independent", 50 considered themselves as "somewhat independent", while 14 patients described themselves as completely dependent on another person.

Four graphs in Figure 5 show the results our patients reported on postoperatively. In assessing their walking ability, 11 patients noted that they always needed assistance, 66 of them noted how they sometimes needed assistance, while 18 patients reported never having the need for assistance after the beginning of the stimulation. For eating the results were as follows after the stimulation: 8 patients reported always needing assistance, 58 sometimes and 29 patients never needed assistance. In their assessment of their ability to clothe independently, 16 patients noted always needing assistance, 42 sometimes, while 37 patients noted how they never needed assistance. Finally, 39 patients reported their subjective feeling of their own independence in doing everyday tasks as "independent", 48 considered themselves as "somewhat independent", while 8 patients described themselves as completely dependent on another person.

There were no intraoperative complications i.e. hemorrhage or infection in the observed patient group. In extremely low weight patients, two cases of wound dehiscence were reported in the place of battery implantation (Activa PC) in the pectoral region.

Discussion

Today, DBS is an acceptable surgical method in treating Parkinson's Disease which, as mentioned before, has shown quite a high efficacy in treating especially the motor symptoms of the disease (3,6). Complications are minimal, less than 1% (5). Indications for DBS play an important role and every patient has to go through very detailed neurological examination before the surgery. Complications of DBS procedure are not common and usually appear as: infection, intracranial bleeding, incorrect positioning of the electrodes, speech impediment and epileptic attacks (4,5).

As mentioned before, in their day-to-day lives patients usually have the most problems with their motor symptoms such as tremor and rigor. Fortunately, these are exactly the symptoms that DBS has the greatest success in relieving (3). Additionally, prolonged use of L-Dopa makes these patients dyskinetic and thus disables them further in their normal life. Lowering the dosage of the medication with DBS is thus an indirect way of improving the patient's condition.

Before the surgery, our patients reported having many difficulties in their normal day-to-day life due to their disease. The activities we decided to analyze were the ability to walk, clothe and eat independently and without the need for assistance, as well as the subjective feeling of their independence (see Fig 4). Of note is that our patients usually had quite an equal distribution of their difficulties, in a sense that none of the difficulties in performing these activities was predominant for everyone. Each patient was thus quite unique and viewed their difficulties differently. Also, of note is how our patients described themselves as independent and without the need for assistance even when they themselves said they sometimes needed assistance in everyday life. This goes to show just the resilience and mental attitude towards getting better, exhibited by most of our patients (here we must add that all our patients go through a rigorous psychological and psychiatric evaluation prior to surgery and any patient with signs of depression or mental problems isn't a candidate for DBS).

After the stimulation the results showed quite an improvement. As mentioned before, the motor symptoms are the ones which usually subside immediately, most notably the tremor and rigor. It is thus to be expected that, for example, eating or clothing without assistance is possible soon after surgery (see Fig 5). Festination and freezing during walking are also a major problem for patients which DBS shows great results in treating, thus allowing walking to be much easier and without assistance. Finally, of note is the fact that 11 more patients reported their subjective feeling of being without the need of assistance after the stimulation, showing how DBS helps with the subjective confidence and courage to fight the disease as well.

The main limitation of our study is that we primarily analyzed the subjective feeling of patients, who of course each have their own expectations and consideration regarding the disease, surgery and recov-

ery. Also, we compared the data as a group of people without comparing the results further regarding sex and age. Nevertheless we feel our study clearly shows how DBS is an excellent treatment option which provides the patients with Parkinson's disease with a hope of alleviating their problems, helping them lead a normal life and allowing them to once again be fully integrated into society, all of which is in accordance to current knowledge and understanding of both Parkinson's disease and DBS.

Conclusion

In our experience, the usage of DBS procedure as a therapy method has been justified in the right conditions. It helps patients who suffer from progressive, disabling neurodegenerative diseases, and usually end in high impairment. DBS most commonly results in clinical and life quality improvement, which reflects to patients themselves, their families, surroundings and society in general. Using DBS, we have accomplished our main goals which are patient independence and partial or full work ability.

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UTJECAJ DUBOKE MOZGOVNE STIMULACIJE NA KVALITETU ŽIVOTA BOLESNIKA S PARKINSONOVOM BOLEŠĆU

Sažetak

Uvod. Duboka mozgovna stimulacija jest ciljana primjena električnih stimulacija na pojedine stanice središnjega živčanog sustava. Najčešća je primjena duboke mozgovne stimulacije kod neuroloških oboljenja kao što su Parkinsonova bolest, distonija, Touretteov sindrom i sl. Cilj je primjene duboke mozgovne stimulacije smanjenje medikamentozne terapije, poboljšanje motoričke funkcije, smanjenje boli i neurološkog deficita te poboljšanje kvalitete života.

Metode. Analizirali smo devedeset i pet dubokih mozgovnih implantacija učinjenih na Zavodu za neurokirurgiju Kliničke bolnice Dubrava u svrhu liječenja Parkinsonove bolesti u razdoblju od 2007. do 2015. godine. Svim je bolesnicima učinjena visokospecijalizirana operacija kojom se implantiraju elektrode u suptalamičku jezgru (STN) te se provedu ekstenzije i implantira baterija.

Rezultati. Četiri su parametra ispitana prije i poslije operacije: bolesnikova mogućnost samostalnog oblačenja, jedenja i hodanja te njihov osobni dojam kvalitete života i mogućnosti samostalnog života. Nakon stimulacije, ukupno gledajući, došlo je do poboljšanja u sve četiri navedene kategorije.

Zaključak. Duboka mozgovna stimulacija pokazala se posve opravdanom kod bolesnika s Parkinsonovom bolešću, pomažući u poboljšanju kvalitete života bolesnika.

Ključne riječi: duboka mozgovna stimulacija, Parkinsonova bolest, suptalamička jezgra

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The Relationship between Gastroesofageal Reflux and Pneumonia in Children

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Abstract

Introduction. Gastroesophageal reflux is the return of the gastric contents into the upper parts of the gastrointestinal tract, and they often enter into the respiratory system resulting in chronic respiratory symptoms and illnesses. Aspiration pneumonia in particular is caused by gastroesophageal reflux. Gastroesophageal reflux is diagnosed using a multichannel intraluminal impedance with pH-metry while pneumonia is diagnosed radiologically. By analysing the findings the patient is diagnosed with aspiration pneumonia.

Aim. To investigate the presence of aspiration pneumonia caused by gastroesophageal reflux by comparing the findings of a multichannel intraluminal impedance with pneumonia radiological findings.

Methods. The study was conducted at the Department of Pulmonology and Allergology for Preschool and Schoolchildren at the Children's Hospital Srebrnjak in the early 2017 by a nurse working at the department. The sample consists of 100 children admitted to hospital for chronic respiratory symptoms who underwent a multichannel intraluminal impedance with pH-metry in order to prove the existence of gastroesophageal reflux and who had a chest X-ray.

Results. The pathologic gastroesophageal reflux was observed in 81 children (81%), a normal chest X-ray in 81 children (81%), and 19 children (19%) had pathological findings of chest X-ray, out of which 8 children had pneumonia (42.1%).

Discussion. In a study of 100 children with chronic respiratory symptoms without risk factors that would favor the aspiration of gastric contents, 7 children with aspiration pneumonia caused by gastroesophageal reflux were identified.

Conclusion. The obtained results show a significant presence of aspiration pneumonia in children with chronic respiratory symptoms which confirms the need for active testing for gastroesophageal reflux in patients with respiratory symptoms, with the purpose of conducting adequate reflux treatment and treatment of pneumonia.

Introduction

Gastroesophageal reflux disease (GERD) refers to the return of gastric contents into the esophagus (1). In infancy, it is a physiological manifestation occurring in 100% of children under 3 years of age and does not cause any significant symptoms (2). Pathologic reflux (3) is the return of gastric contents with symptoms in the gastrointestinal tract called gastroesophageal reflux disease (GERD) (1, 2). Symptoms and illnesses caused by GERD include spitting up, vomiting, not gaining body mass, increased salivation, chest pain, heartburn, burping, nausea, difficulty swallowing, blood in the stool, anemia, irritability and neck extension (Sandifer syndrome).

The return of gastric contents into the respiratory system leads to laryngopharyngeal reflux (LPR) (4, 5) and aspiration syndromes (6). Aspiration syndromes lead to a number of respiratory symptoms and illnesses (6). Symptoms and illnesses caused by LPR are apnea, hoarseness, throat clearing, postnasal secretion, cough, throat pain, burning mouth, laryngitis, bronchospasm, sinusitis and middle ear inflammation. Long-lasting microaspirations of the gastric content into the lungs can cause chronic bronchitis, bronchiectasis, pulmonary fibrosis and pneumonia (4, 5, 7).

Pneumonia occurs in about 50% of children with aspiration of the gastric content (6), and may be acute, recurrent or nonresolving pneumonia (5). They are caused by the penetration of digestive tract bacteria into the respiratory system which has already been damaged by the action of gastric contents, and most commonly affect the right lung and lower lobes (6, 8). Risk factors such as enteral nutrition through gastric probe, diaphragmatic hernia surgery, neurological disorders with difficulty chewing and swallowing, vocal cords paralysis, tracheoesophageal fistula, laryngeal and phyryngeal cleft, and cleft palate and lip stimulate aspiration (5, 6).

Children with respiratory symptoms are treated at the Children's Hospital Srebrnjak, where children with chronic respiratory symptoms require additional treatment, which involves using a 24-hour multichannel intraluminal impedance-pH metry (MII / pH) for measuring the return of gastric contents (9, 10) and radiological treatment, for the purpose of diagnosing gastroesophageal reflux and its effect on the symptoms in the respiratory tract (11, 12).

Nurse's intervention in placing a probe for multichannel intraluminal impedance with 24 hour ph-metry

The use of multichannel intraluminal impedance with 24-hour pH-metry improved the diagnosis of gastroesophageal reflux and aspiration pneumonia and became an indispensable part of treatment of chronic and recurrent respiratory problems. The role of a nurse in correctly placing the probe and the correct diagnosis of the disorder is very important.

The procedure of placing a probe is standardized and requires the child's hospitalization (13). Prior to the hospitalization, the nurse informs the parent or the guardian of the child that the day before and during the measurement they must not take oral therapy and that they must come on an empty stomach. During the hospital treatment, the child is taken to the department and the parents sign the consent form for the procedure that the nurse checks prior to the procedure. Upon admission of the child, the nurse takes relevant medical history about the acute medical condition of the child to exclude respiratory or gastrointestinal infections because the child must be afebrile, healthy and on an empty stomach.

The nurse identifies possible allergies, and the reasons and chronic symptoms for which the child is being treated. It is important that the nurse always asks about the previous chest X-rays and when they were performed, in order to avoid frequent and excessive radiation of the child. In the case of a child being x-rayed on multiple occasions or immediately before the treatment, the physician decide not to use x-rays to check the position of the probe. In these cases, the probe position is estimated by an approximate calculation based on the height of the child and the pH values obtained when placing the probe.

The probe used for the multichannel intraluminal impedance with pH-metry must be stored in a dry place, the probe is clean but not sterile and should not be used more than once because the reuse of a disposable probe can lead to cross contamination and patient infection. Prior to the placing, the nurse takes the probe out of its packaging and checks whether the probe is intact or damaged. After inspecting the probe, the nurse calibrates the probe, ie. the electrodes on the probe. The calibration of the probe is carried out in several stages:

1. The probe electrodes are placed in a liquid for 15 minutes. The liquid must have a pH of 7, and

the physiological solution is most often used. All eight probe electrodes must be immersed in the appropriate liquid during calibration. A new calibration liquid is required for each patient.

2. After 15 minutes the probe is rinsed under water and dried.
3. The probe is then plugged into the measuring device and the probe calibration program is started by pressing the calibration key on the device. Every new measurement requires new batteries to be used in the measuring device in order to prevent accidental shutdown and the interruption of the scan.
4. The probe is first put into the acidic liquid with a pH of 4.
5. After the completion of the calibration, the probe is washed with water and dried.
6. The probe is placed in a liquid with a pH of 7.
7. When the device shows "record" it is ready for probe placement and the start of the measurement.

At the end of the electrode calibration, the nurse prepares a card for entering the measured values. The card is placed in the computer, and the nurse enters in the appropriate program the patient information - the patient's identification number, name and surname, date of birth, body mass and height, and code and number of the probe. Upon completion, the card is removed from the computer and placed in the measuring device. The nurse determines the length of the probe that needs to be placed according to the physician's instructions using the modified Strobel formula: the height of the child/ 4 minus 2 cm. The obtained length is marked on the probe. This makes the measuring device and probe ready for placement.

When placing the probe, the child is sitting in the mother's lap or in the lap of the medical staff, or if calm, on its own. The nurse patiently and calmly explains the procedure of placing the probe. Prior to placing the probe into the nose, the nurse examines the contraindications for the introduction of probe, which include the more severe deviation of the septum, nasal congestion or nosebleed. In these cases, the placing of the probe is left to the physician or an ORL specialist. In the case of the impossibility of pulling the probe through the nasal passage an ORL physician places the probe while using the endoscope. The top of the probe is covered with lidocaine for easier and painless sliding of the probe.

The probe is placed through the nose along the lower part of the nasal passage, while the child drinks water using the straw to facilitate swallowing and entering of the probe into the esophagus. The probe is placed through the nose till the marked length obtained by the formula calculation. A nurse, with or without spatula, checks the position of the probe in the throat, ie whether the probe passed through the nasal passage since there is a possibility of bending and stopping of the probe in the nose passage. Attention should also be given to the dry cough that indicates to the position of the probe in the trachea or one of the major bronchi. Once the probe position is checked, the probe is fixed to the cheek, pulled over the ear and further fixed to the neck. The position of the probe is checked by a physician on a chest X-ray and if necessary, the nurse corrects the position of the probe according to the X-ray finding and the doctor's instructions. This is how the probe placement is completed.

After the probe position is checked, the device is turned on and the monitoring starts. The monitoring lasts for 24 hours, it can last shorter but not less than 18 hours. During the monitoring, the patient, the parent or the guardian will keep a journal of food and fluid intake, changes in the body position, activities performed by the child, and possible symptoms of heartburn, coughing and vomiting. The device has the appropriate keys for standing and lying positions, for the start and end of food intake, and for the occurence of cough, pain, and heartburn symptoms.

At the end of the monitoring, the nurse presses the stop key to stop the monitoring and pulls out and takes care of the probe. This is where the nurse's job finishes. The card is removed from the device and placed in the memory stick of the computer and the doctor reads the findings.

The psychological preparation of the child by parents and nurses is an essential component to make the procedure as successful as possible with the least trauma for the child. The nurse explains the procedure to the parents and the child prior to the hospitalization in detail and in the way that the child could understand it as well. In such a way, the parent, who is familiar with the procedure, can reduce the child's fear of upcoming hospitalization at home. Upon the child's admission to hospital, the nurse again calmly and kindly explains to the child all the procedures that are being carried out, and in the same manner conducts the probe placement. Parents' stay with the

child before, during and after the procedure lessens the child's fear and sense of unease.

The role of a nurse is important at all stages of the procedure: during the patient's preparation for the procedure, during and after the procedure. Care for the patient during the procedure requires a multidisciplinary and professional level of nursing knowledge.

Aim

The aim of the paper was to investigate the presence of aspiration pneumonia in children with chronic respiratory symptoms caused by reflux. In children treated for chronic respiratory symptoms without risk factors for aspiration development, the results obtained by MII/pH and chest X-ray were compared and thus establishing the correlation between the pathologic gastroesophageal reflux findings and with pneumonia radiological findings.

In this way, in the study group, the frequency of aspiration pneumonia caused by GER was assessed in children without risk factors for aspiration.

Methods

The research was conducted at the Department of Pulmonology and Allergology for Preschool and Schoolchildren at the Children's Hospital Srebrnjak, at the beginning of 2017. A retrospective analysis of the children's data from 2016 and a prospective analysis of children's data from 2017 research were conducted. The research was carried out by a nurse responsible for the MII/pH probe placement in the abovestated department.

The data of 100 children hospitalized due to the treatment of chronic or recurrent respiratory symptoms were analysed. There were 69 boys (69%) and 31 girls (31%). The average age was 9.18 years, and the age range from 13 months to 18 years. The research did not include children with neurological risk factors and anatomic anomalies that may favor the development of aspiration syndromes. Furthermore, they were healthy children, i.e. children with no febrile or acute symptoms of respiratory or digestive infections, as these are contraindicated symptoms for MII/pH. All children involved in the study had a signed parents' consent for the procedure.

As part of the treatment, a multichannel intraluminal impedance with 24-hour pH-metry was performed, alongside a usual chest X-ray. The purpose of chest X-ray is to confirm the appropriate position of the probe, but also to get insight into the condition of the lungs, which is necessary in view of the chronic respiratory symptoms. Due to X-ray induced radiation, there is always a tendency to combine these two procedures so as to perform one chest X-ray for lung diagnostics and to confirm the position of the MII/pH probe.

The results of the multichannel intraluminal impedance with 24-hour pH-metry, is analyzed and read by a departmental physician. In the study, multichannel intraluminal impedance with pH-metry findings were processed and classified as:

1. Normal MII/pH - if negative or borderline without the need for medication.
2. Pathologic gastroesophageal reflux - if positive and with the necessity for medication.

Chest X-ray findings, described by a radiologist specialist, are processed and classified as:

1. Normal chest X-ray.
2. Pathological finding that includes changes described as endobronchitis, peribronchitis and inflammatory infiltration.

Pathological radiological findings are also divided by the place of pathological change:

1. Right lung
2. Left lung
3. Both lungs

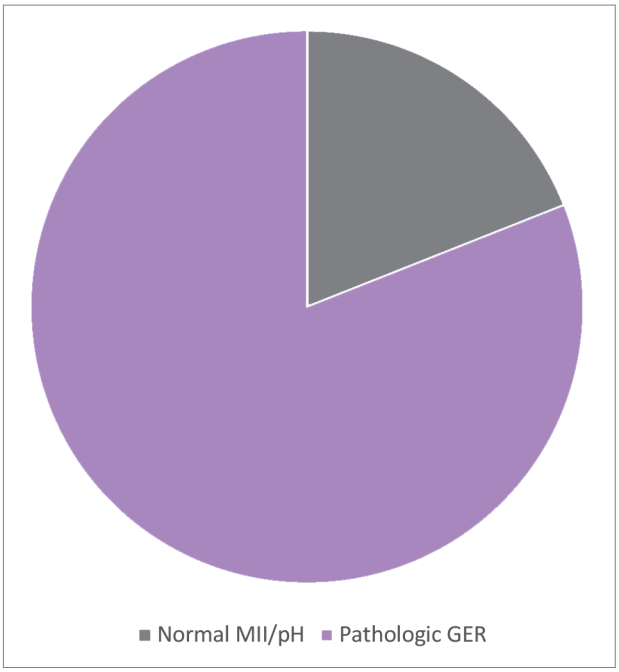
After the analysis and the processing of the required data, the statistical analysis of the results using a chi-squared test was performed, and the results were presented either in tables or graphs.

Results

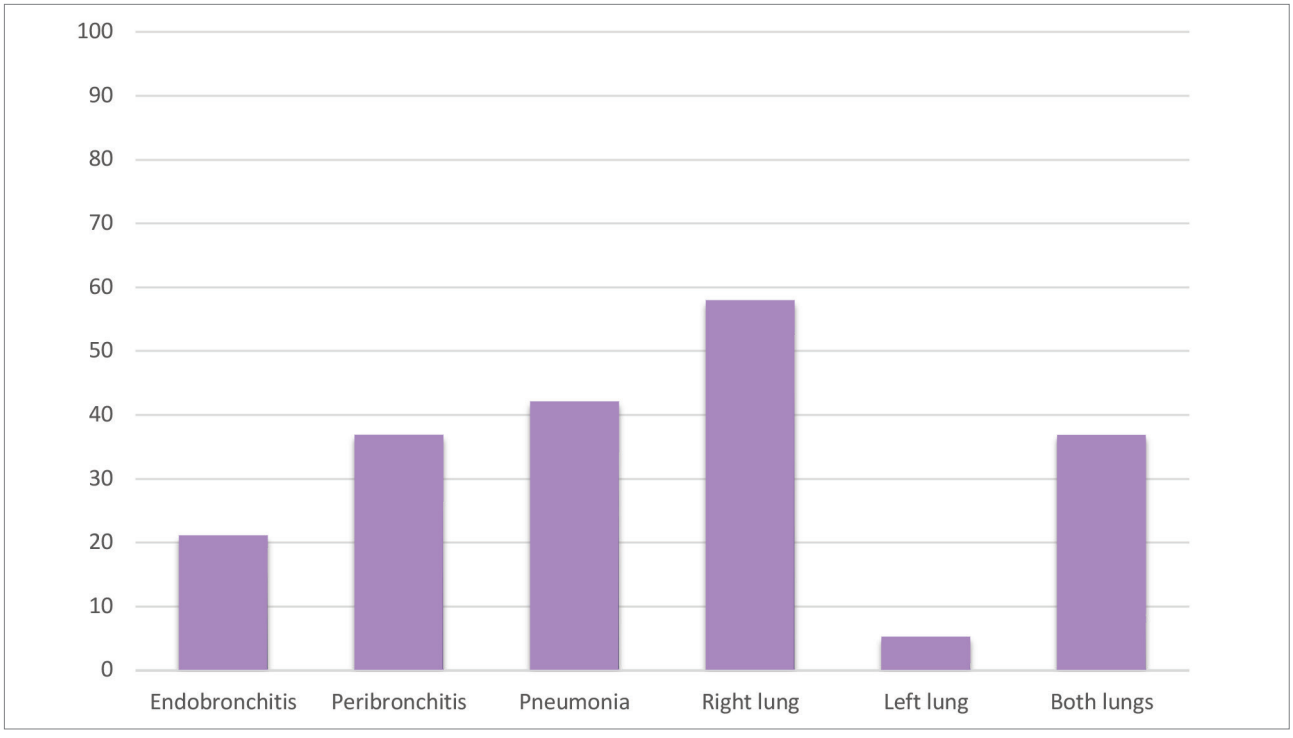
Out of 100 children, the physician read pathologic gastroesophageal reflux in 81 children (81%), while 19 children (19%) had normal values of the multichannel intraluminal impedance with pH-metry (Graph 1). The average age among children with pathologic GER in our study is 9.49 compared to children with normal values of multichannel intraluminal impedance whose average age is 7.84 years.

Out of 100 children who had a chest X-ray, 81 children (81%) had a normal X-ray and 19 children (19%) had pathological findings of the X-ray. Endobronchitis was present in 4 (21.05%), peribronchitis in 7 (36.84%), and inflammation in 8 children (42.1%). The place of pathological changes is located in the right lung in 11 children (57.89%), in the left lung in one child (5.26%), and in both lungs in two children (36.84%) (Graph 2).

Table 1 shows the correlation of GER findings with chest X-ray findings. Among 81 children with proven pathologic GER, 16 children have pathological findings of chest X-ray - 11.11% have endobronchitis or peribronchitis, and 8.64% of children have pneumonia. Out of 19 children with normal MII/pH values, three children had a pathological finding of chest X-ray (15.78%).



Graph 1. **Results of MII/pH-metry in 100 study children**



Graph 2. **Results of chest X-ray and place of pathological change in 100 study children**

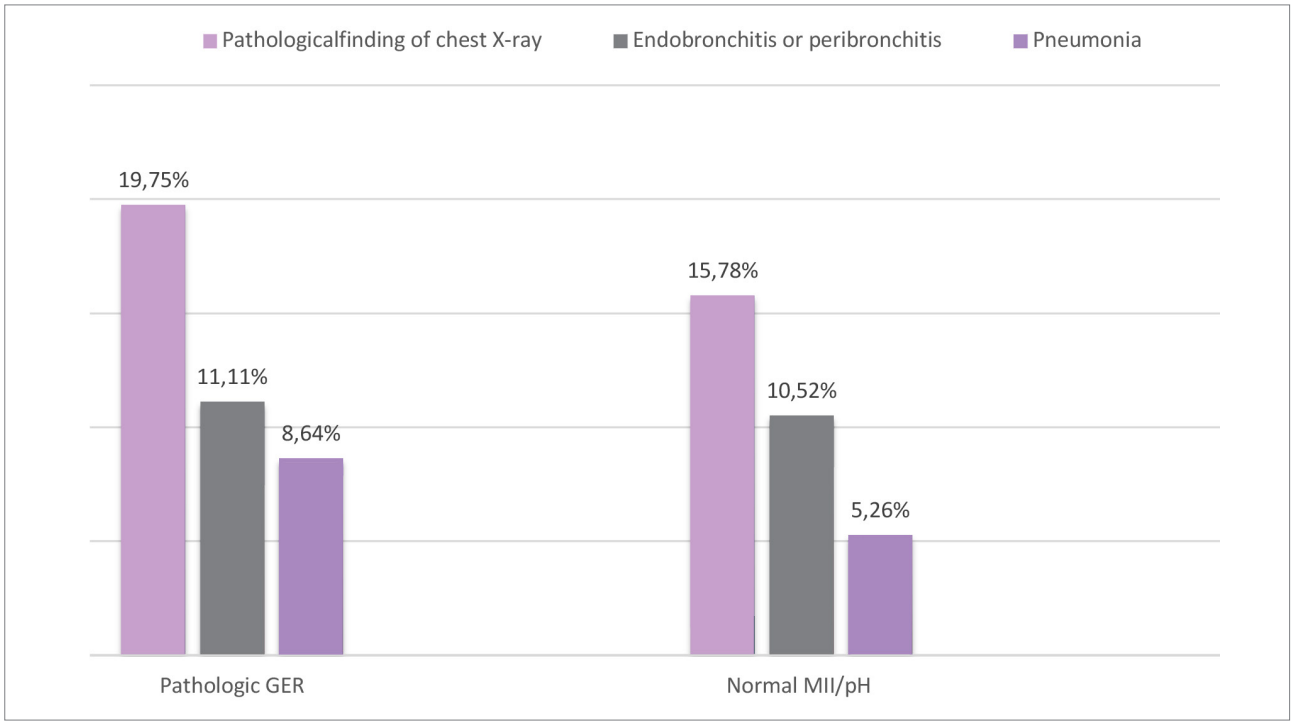
Table 1. **Distribution of pathologic GER findings with pathological findings of chest X-ray**

Chest X-ray findings	Pathologic GER 81 children	Normal MII/pH 19 children
Normal 81 children	65 children 80.24%	16 children 84.21%
Endobronchitis or peribronchitis 11 children	9 children 11.11%	2 children 10.52%
Pneumonia 8 children	7 children 8.64%	1 child 5.26%

In children with proven pathologic GER, there is a slightly higher incidence of chest X-ray pathological findings (19.75%) compared to children with normal MII/pH values (15.78%), but a statistical analysis using a chi-squared test showed no statistically significant differences ($\chi 2 = 0.1571$; $p = 0.692$): there was no significant difference in the proportion of children with pathological finding of chest X-ray between groups of children with pathologic GER compared to children with normal MII/pH values. This is also confirmed by the phi-coefficient of correlation that is low and not significant ($\Phi = 0.04$; $p = 0.692$).

However, when only children with pathologic findings of chest X-ray are observed, the proportion of children with pathologic GER is significantly higher in comparison to children with normal MII/pH values. Using a chi-squared test on a single sample $\chi 2 = 8.9$; $p < 0.01$ is obtained, where the authors are aware of the limited range of this result due to a small number of participants. Therefore, there is an indication of a greater presence of gastroesophageal reflux in children with endobronchitis or peribronchitis, i.e. in children who have pneumonia.

In a group of 100 children treated for chronic respiratory symptoms, 7 children have radiologically confirmed pneumonia and there is a pathological finding of multichannel intraluminal impedance, meaning that out of 100 children, 7% of children have aspiration pneumonia.



Graph 3. **The incidence of pathological finding of chest X-ray in a group of children with pathologic GER**

Discussion

The published data connect a higher incidence of GER with smaller children (1, 2), a study published in 2000 (4) shows that the largest number of children with pathologic GER are infants. This study was conducted at the Department of Pulmonology and Allergology for Preschool and Schoolchildren, which does not normally treat children under the age of 3. In this study, only 13 children were of the age of 3 years or younger, which affects the final average age in the group with pathologic gastroesophageal reflux. Children with aspiration changes in chest X-ray associated with pathologic gastroesophageal reflux, have a lower age of 8.68 years, compared to the whole group and the group of children with only pathologic gastroesophageal reflux without aspiration changes in the chest X-ray. This may indicate that more severe reflux-induced changes are more pronounced in younger children.

In the study group of 100 children, pathologic GER was found in 81% of the children. A study conducted at the Zagreb Clinic for Children's Diseases and published in 2000 (4) indicated pathologic GER in 67.4% of the children treated for chronic respiratory symptoms. The study was based on a 24-hour pH-metry without multichannel intraluminal impedance. In this study, children were treated with a combination of multichannel intraluminal impedance with pH-metry which is a more sensitive method and higher results are explained by greater sensitivity of the method.

Aspiration pneumonia is more commonly described among children with risk factors for GER (5) such as psychomotor retardation, neuromuscular disorders, anatomic anomalies in the mouth area. The research group included children without risk factors. The obtained research results show that aspiration pneumonia is often present (8.64%) in children with GER who do not have associated risk factors for aspiration. Statistical analysis showed that there was no significant difference in the proportion of children with pathologic findings of chest X-ray between the groups with pathologic GER and normal MII/pH values. This is not in accordance with our expectations, and the reason for such a result can be found in the participants' particularity since they are children who all have certain respiratory problems. Children with radiologically proven pneumonia and without proven gastroesophageal reflux, should undergo further tests such as immune or bronchology tests to exclude the cause of pneumonia.

In a group of 100 children treated for chronic respiratory symptoms, 7 children had radiologically detected pneumonia and there was a pathological finding of multichannel intraluminal impedance, meaning that out of 100 children, 7% had aspiration pneumonia. Studies on children with proven recurrent or persistent pneumonia have shown that aspiration causes pneumonia in 5% to 29% (14, 15, 16). In the abovementioned studies, only children with pneumonia symptoms were diagnosed while in the study group for the purpose of this work children with a wider range of chronic respiratory symptoms were included. Ghezzi and his associates, based on a two-year retrospective study, have shown that children with frequent reflux episodes have increased risk of repeated respiratory infections (17). Rybak and his associates have demonstrated the correlation between acid reflux with chronic pulmonary symptoms (18), which Borelli explains in his study where he demonstrated the correlation between aspirated gastric contents in the respiratory system and respiratory symptoms resulting from it (19). The results of this study suggest that there is a significantly more frequent pathologic GER finding in children with pathologic findings of chest X-ray, but since this is a small number of participants, the findings should be checked on a larger sample. Aspiration pneumonia is more common in children with chronic respiratory symptoms (7%) even when there are no symptoms typical for pneumonia such as febrility, cough, difficulty breathing and auscultation pathology. This is extremely important because the use of appropriate antireflux therapy such as antireflux measures and medication therapy with proton pump inhibitors can lead to treating inflammatory changes, prevention of disease progression, and termination of respiratory symptoms.

The weakness of research primarily refers to the absence of children under the age of 3 in the group of participants, meaning that the given age group is not adequately represented in the results of the study. Further research could analyse, as an important information, the frequency of aspiration pneumonia depending on the age group of children to see how much age and development of the respiratory system is essential for the development of pneumonia

in GER. Also in this study, reflux height, i.e. the height to which the gastric contents are raised, was not analysed, and in further research it would be good to determine reflux height and the relationship between the height and type of reflux with radiological changes in the lungs.

Conclusion

Among children with chronic respiratory symptoms without any risk factors favoring the aspiration of the gastric contents, there were 7 children, i.e. 7% of patients with aspiration pneumonia caused by gastroesophageal reflux. There was no significant difference in the proportion of children with pathological findings of the chest X-ray between children with reflux and those without it. In children with pathological findings of chest X-ray, the proportion of children with gastroesophageal reflux is significantly higher in comparison to children with normal MII/pH values.

The obtained results indicate frequent presence of aspiration pneumonia in children with chronic respiratory symptoms, which confirms the need for active testing for gastroesophageal reflux in patients with respiratory symptoms and for the purpose of conducting adequate reflux treatment and pneumonia prevention.

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POVEZANOST GASTROEZOFAGEALNOG REFLUKSA I UPALE PLUĆA KOD DJECE

Sažetak

Uvod. Gastroezofagealni refluks jest povrat želučanog sadržaja u gornje dijelove probavnog trakta, a često dolazi do ulaska sadržaja u dišni sustav, pri čemu nastaju kronični respiratorni simptomi i oboljenja. Posebice se izdvaja aspiracijska upala pluća uzrokovana gastroezofagealnim refluksom. Gastroezofagealni refluks dijagnosticira se multikanalnom intraluminalnom impedancijom s pH-metrijom, a upala pluća dijagnosticira se radiološki. Analizom nalaza pacijentu se postavlja dijagnoza aspiracijske upale pluća.

Cilj. U djece bez rizičnih faktora koja se obrađuju zbog kroničnih respiratornih simptoma utvrditi povezanost gastroezofagealnog refluksa, dijagnosticiranog multikanalnom intraluminalnom impedancijom, s radiološkim nalazom upale pluća.

Metode. Studiju je provela medicinska sestra početkom 2017. godine na Odjelu za pulmologiju i alergologiju predškolske i školske dobi Dječje bolnice Srebrnjak na uzorku od 100 djece zaprimljene zbog kroničnih respiratornih simptoma, u kojih je učinjena multikanalna intraluminalna impedancija s pH-metrijom radi dokazivanja gastroezofagealnog refluksa. U navedene djece učinjen je i RTG pluća.

Rezultati. Patološki gastroezofagealni refluks očitan je kod 81 djece (81 %), uredan RTG imalo je 81 dijete (81 %), a 19 djece (19 %) imalo je patološki nalaz RTG-a, od toga upalu pluća osmero djece (42,1 %).

Rasprava. Učinjenim istraživanjem u skupini od 100 djece s kroničnim respiratornim simptomima bez rizičnih čimbenika koji bi pogodovali aspiraciji želučanog sadržaja izolirano je sedmero djece s aspiracijskom upalom pluća uzrokovanom gastroezofagealnim refluksom.

Zaključak. Dobiveni rezultati pokazuju znatnu prisutnost aspiracijske upale pluća među djecom s kroničnim respiratornim simptomima, što potvrđuje potrebu aktivnog traženja gastroezofagealnog refluksa kod bolesnika s respiratornim simptomima, u svrhu provođenja adekvatnog liječenja refluksa i suzbijanja prisutne upale pluća.

Ključne riječi: gastroezofagealni refluks, aspiracijska upala pluća, impedancija

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Patient Complaints – a Tool for Improving Quality of Nursing Care

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Abstract

Introduction. Patient complaints are the point of the patient's dissatisfaction with the healthcare service (nursing care, etc.). The inadequate handling of patient complaints may result in negative consequences for the healthcare institutions, but also for employees involved in the healthcare process. Healthcare institutions in the Republic of Croatia are obliged to prescribe procedures for handling complaints of patients who must meet certain criteria. According to these criteria the institutions can introduce their own way of dealing with patient complaints. It includes monitoring, analysis and corrective actions based on the analysis of patient complaints. Nurses make a large number of healthcare staff (especially hospital staff) and they contribute significantly to the overall quality of their services and are an important factor in ensuring quality and positive perception of health care. Therefore, it is important to manage complaints in the field of health care.

Aim. The aim of this paper is to investigate complaints management in the field of nursing care to present a way of handling patient complaints, conduct a patient complaints analysis with special emphasis on complaints related to the work of nurses.

Methods. A database search was conducted to find literature from this area and a retrospective analysis of patient complaints filed through the hospital complaint filing system in the period from 1st January to 31st December 2017.

Results. During this period 147 complaints and 132 commendations were received and analyzed. Of the total number of complaints, 21 (14%) referred to nurses. Most complaints (66%) referred to nurses employed in the polyclinic section. They mostly indicated dissatisfaction with communication (40%) and, in the opinion of patients, inappropriate attitude towards them (31%).

Conclusion. The results represent guidelines for the implementation of further measures to improve the quality of health care in this area.

Introduction

The role of complaints in the healthcare quality system

Comments and complaints from health service users provide unique pieces of information about their needs and the quality of the health care they receive. Therefore, it is important to pay attention to the needs and the satisfaction of the users and that is the priority of the management of all organizations, as well as the healthcare organizations.

Some authors believe that patient complaints can be a gift which gives valuable feedback from their patients (1). In the healthcare environment they express patient dissatisfaction and may point to problems in providing health services (2). Patient complaints also provide important and additional information on how to improve patient safety, so they are an additional source of data in this area, and are also important for detecting systemic problems in providing health services (3).

Only a small part of people who are dissatisfied will file a complaint (less than 4 percent), but will tell the family and friends about their bad experiences or go to another healthcare facility, if possible (4). This is an argument that requires a proactive approach to getting feedback from health service users, all in order to improve their quality.

When we are considering patient complaints, it should be kept it in mind that they are sometimes individual patient experiences, which also have their own characteristics. They can be emotional and focused on the attitudes and skills of an individual and do not necessarily point to quality healthcare improvement priorities, but usually only point to critical places. In consideration of patient complaints, we should be aware of all the circumstances affecting the healthcare process (such as an overload of staff) which patients are not usually aware of. All of these provide a reason for a serious and systematic approach to patient complaints analysis.

Today there are a lot of (5,6,7) legal regulations and campaigns that are aimed at ensuring and protecting the rights of patients and healthcare workers. In The Republic Croatia the complaints procedure is prescribed in a national legal document (Regulations on standards of healthcare quality and the manner of their application, Official Gazette 79/2011). It includes the criteria that the complaint procedure must contain: a list of contact persons; systematic review and resolution of complaints by the principal or written delegation of this function to a suitable person or commission; the process of referral of the quality of care to the Commission for Internal Control; determining a reasonable time frame for a systematic review and response to the complaint; a complaint decision that must be in writing and sent to the patient. The complaint decision must include the contact person in the health institution, the steps taken in the investigation, the outcome of the complaint process and the end date (6). This is particularly important for hospital healthcare institutions, which must be places where these rights will be emphasized and respected.

Accreditation bodies also require from hospital healthcare institutions to systematically approach patient complaints and describe it as a tool to manage and improve the quality of health care (8,9). Patient complaints may play a significant role in setting quality standards because they require a systematic overview of individual incidents and trigger interventions that will prevent the future problems (10).

In order to address the complaints of the patients, the healthcare institutions create a dialogue with the complainants, investigate complaints and make conclusions for each individual patient (it can be: apologizing, rejection of compensation, etc.) (11). Some institutions develop standardized methods and guidelines for their analysis to describe the type and frequency of phenomena that cause patient complaints (12). The recommendations outlined in the literature on successful complaints management advocate a positive approach to their resolution, ethics, commitment and teamwork.

The role of nurses in the healthcare system

Nurses, as an important part of the health system, have a significant contribution to achieving the quality of this system. In the Republic of Croatia, they make more than 50% of healthcare workers, so their services have a significant impact on the quality of the entire system (13). The nursing care is a healthcare service, which implies the importance of quality management of health care as well as cooperation

with other healthcare practitioners and improving the quality of the entire health system (14).

Due to the presence of nurses and their contribution to the quality of healthcare services, monitoring and analysis of patient complaints in the field of health care is not only an obligation but also a need. In this area, it is useful to follow the complaints management guidelines and consider them in the context of the overall health care provided at a particular institution.

Nurses, along with various affiliated professions, participate in the healthcare process. They operate in accordance with professional standards and legal regulations, and among other things they are obliged to represent patient interests, respect their rights and preserve the reputation of the institution (employer) (15).

Research on healthcare complaints is deficient and unreachable, and the importance of proper access is emphasized in the guidelines issued by professional nursing societies. These recommendations were issued with the aim of assisting nurses in dealing with patient complaints and restoring their confidence in the nursing profession (16).

Handling of patient complaints in the nursing profession is also confirmed by the fact that the International Council of Nurses (ICN) issued guidelines explaining the main aspects of the complaint handling process. It lists the responsibilities in solving incidents and complaints in the case of unacceptable practices and stresses the importance of professionalism for securing public confidence in the nursing profession (25).

Experiences and recommendations for handling complaints

Today, patient complaints in the healthcare system are increasingly represented. The first article on complaints was published in 1987, and research in this area has since then grown considerably (3). There are numerous reports stating that more than 100,000 complaints per year are reported in the health system that may be related to various dissatisfaction, their consequences and ways of dealing with them (17,18,19).

It is difficult to estimate the number of unsatisfied patients. Written patient complaints that reflect dissatisfaction are just the tip of the iceberg. According to some data, more than one third of the patients in the United States experienced some degree of hospital dissatisfaction, but only a small part of these patients complained (24). There are still a number of barriers to complaints. Some barriers are present in patients (their fears, disrespect...), and some because of an inadequate complaint management system (complicated, unavailable, inconsistent, etc.) (11).

The first systematic English literature review, which included 59 studies and 88,069 omplaints in the healthcare system, suggests a serious and a standardized patient complaints analysis. In conclusion of this systematic review, it is stated that patient complaints can standardize critical sites in clinical, control areas as well as in the area of relationship within the healthcare system (3).

In the research on patient complaints, carried out in the period from 1997 to 2001, in 67 Australian hospitals, differences were compared with regard to the demographic characteristics of patients and the various places where care was provided to patients in hospital healthcare facilities. The categories of complaints related to: communication, availability, health care, patient rights, administrative affairs, hospital environment. The frequency of complaints was 1.42/1000 patients, and they were more frequent in women, people living in cities. Most complaints related to the emergency unit, operating room and polyclinics. Communication was the area where patients most complained and the complaint solution was in most cases satisfactory and without major consequences. The conclusion of this research is to emphasize the standardization and complaint databases (21).

There is very little public talk about problems in the quality system and the complaints of patients on our premises. In a research conducted in 2016 at University Hospital Centre Sestre milosrdnice, the frequency of received and processed patient complaints was 1.08 cases per 10 000 treatment cases. The frequency of complaints in this health institution in 2017 was 1.32 cases per 10 000 cases of treatment, which is an insignificant increase compared to 2016. The quality of interaction with staff and communication involved 24% of complaints, patient care and medical records 33% of complaints, availability of hospital care 31%, infrastructure 6.7% and hospital accounts 5.3% (20).

On the other hand, in the more developed healthcare systems more research is being conducted in this

area, and evidence-based practices are being developed that help health professionals successfully manage patient complaints (4,22).

Managing complaints in the University Hospital Centre Sestre milosrdnice

In order to improve the management of complaints handling, University Hospital Centre Sestre milosrdnice has modified the complaint handling procedure in 2015. The complaint form has been simplified and written submissions have been made possible by filing complaints electronically. All complaints are collected in a unique place in the Legal Affairs Sector which upon the receipt of the complaint, informs the head of the organizational unit to which or to whose employees the complaint relates.

The patient may file a complaint in several ways:

- In writing, on the official hospital form: „Submission of a complaint/commendation". Complaint forms are available at the hospital department/clinic and on the webpage of the Hospital in the „Patient Guide" section. Complaints or praise can be sent by e-mail.
- Written in the Central Book of Complaints and Commendations that is located at the Information desk in the hospital.
- Electronically through the application: "Electronic Book of Complaints and Commendations", which is on the home page of the University Hospital Centre Sestre milosrdnice website (Figure 1).

Patients can choose the way they are most comfortable with and in order to get an official response to this complaint, the contact address and personal information must be specified. Anonymous and incomplete complaints are also being considered, but they are not answered.

Heads of units are required from The Legal Affairs Sector to investigate the circumstances of the complaint, collect all responses to complaints and, if possible, immediately remove any irregularities. They are also obliged to submit a report to them, in the shortest possible time, facts and actions undertaken, which in cooperation with The Office of Quality is in writing corresponded to the complainant. The Office receives all the complaints, inspects them, carries out their analysis and reports to the Quality and Hospital Administration Commission, whereupon, if necessary, measures are undertaken to improve this area.

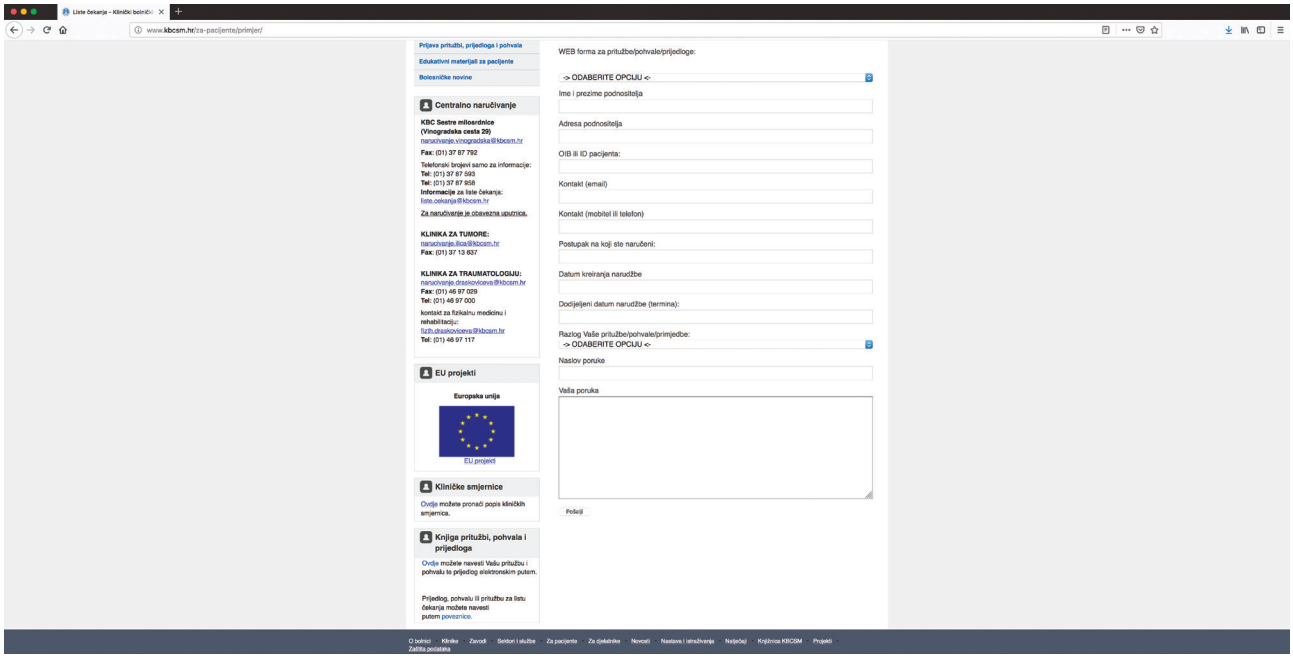


Figure 1. **Electronic filing of complaints/commendations at the University Hospital Centre Sestre**

Aim

The aim of this research was:

1. To analyze all patient complaints in our hospital, with special emphasis on complaints related to the work of nurses.
2. Also, our goal was to analyze complaints in the field of nursing and search answer which category of complaints have differences compared to the others. So hypotheses will be set up:
   - Hypotheses 0: There is no difference between the number of complaints for each category.
   - Hypotheses 1: There is a difference between the number of complaints for each category.

Methods

For this research MEDLINE data base was searched and our own classification of complaints was made based on the examples in literature. Distribution of complaints was observed and also testing of hypotheses which referred to the existence of observed and expected differences. Also, patient comments were observed individually.

Data on complaints that was used to do this research was taken from UHC Sestre milosrdnice from the Hospital Register of Complaints.

A document: „Submission of a complaint/commendation", specially designed for filing complaints/commendations in writing or in electronic form is standardized. In this document, a patient may (but not necessarily) enter his/her personal data and contact, date, time and place of his/her complaint, specify the person to whom the complaint/commendation relates as well as the reason for the submission. In the electronic complaint/commendation, the patient can choose the answer offered when he states the place of the event and the reason why he decides in this way to express his or her experiences. In addition, the complainant is offered a blank space where he could describe the subject matter in his/her words.

For the purpose of monitoring and analyzing patient complaints related to the work of nurses, a retrospective analysis of complaints that were part of the Hospital register of complaints in the period from 1st January to 31st December 2017 was made. Despite all the complaints, their frequency and the areas complained of were investigated, special emphasis was placed on the complaints related to the nursing profession. Monitoring and analysis of patient complaints are a common practice of the Office for Quality, which is carried out once a year.

Results

In the twelve-month period (from 1st January to 31st December 2017) in the UHC Sestre milosrdnice, 142 complaints and 132 commendations were received through the system of collecting complaints/commendations on healthcare workers. From 142 complaints, 21 referred to nurses.

In the analysis of the complaints related to nurses, the areas complained of and the coverage of certain categories of complaints was monitored and also the distribution of complaints regarding nurses' age, sex and working area.

Table 1. **Distribution of patient complaints regarding the nursing work area**

Area	Number and percentage
Wards	5 (23%)
Polyclinics	14 (67%)
Intensive Care Units	1 (5%)
Emergency	1 (5%)
TOTAL	21 (100%)

In the analysis it was noted that the majority of complaints related to nurses employed in the polyclinic part of the institution.

Table 2. **Distribution of patient complaints regarding category**

Category of complaints	Number and percentage
Inappropriate communication	18 (40%)
Inappropriate care and inappropriate behaviour towards patient	3 (7%)
Violation of patient rights	10 (22%)
Unprofessional behaviour	14 (31%)
TOTAL	45 (100%)

Only 21 complaints were addressed to the nurses and some complaints contained several areas where patients complained, so the overall number of complaints was 45. In the first place, this was inappropriate communication (40%), but also the unprofessional behavior of the nurses complained of (31%) and violations of legally prescribed rights of patients (22%). This complaint classification has been modified in accordance with its own circumstances and based on a classification of complaints that puts them in three leading domains (clinical, managerial, relationships) that continue to fall into different categories and subcategories.

To determine whether there is a statistically significant difference in the share of different categories of patient complaints (Table 2) we have compared them with random distribution. The results show a significant difference ($\chi 2 = 10.9$; df = 3; $p = 0.012$). We have concluded that the *Inappropriate care* and *Inappropriate behavior* toward the patient is statistically significantly lower than the *Inappropriate communication* ($\chi 2 = 10.714$; df = 1; $p = 0.001$) and *Unprofessional behavior* ($\chi 2 = 7.118$; df = 1; $p = 0.08$).

The analysis shows the distribution of complaints regarding the type of applicant, the manner in which they were filed (given the anonymity and form of submission), as well as the monthly common complaint referred to the nurses. For additional categories of

Table 3. **Distribution of complaints toward nurses**

Month	Applicant	Anonimusly	Sex	Way of complaint	Number of complaints
Jan	Accompaniments	No	F	electronic	1
Jan	Patient	Yes	F	electronic	1
Jan	Accompaniments	No	F	electronic	1
Jan	Accompaniments	No	F	electronic	1
Jan	Patient	No	F	electronic	1
Feb	Accompaniments	No	M	electronic	1
Feb	Patient	No	F	electronic	1
Feb	Patient	Yes	F	electronic	1
Feb	Patient	No	F	electronic	1
Feb	Patient	No	F	electronic	1
Mar	Patient	No	F	electronic	1
Mar	Accompaniments	No	F	electronic	1
Mar	Accompaniments	No	F	electronic	1
May	Patient	No	F	electronic	1
Jun	Patient	No	M	electronic	1
Jul	Accompaniments	No	F	electronic	1
Sep	Accompaniments	No	F	electronic	1
Sep	Patient	No	F	electronic	1
Sep	Accompaniments	No	F	electronic	1
Oct	Patient	No	M	electronic	1
Dec	Accompaniments	No	F	electronic	1

applications, additional analyses have been made and some statements are specific to each category.

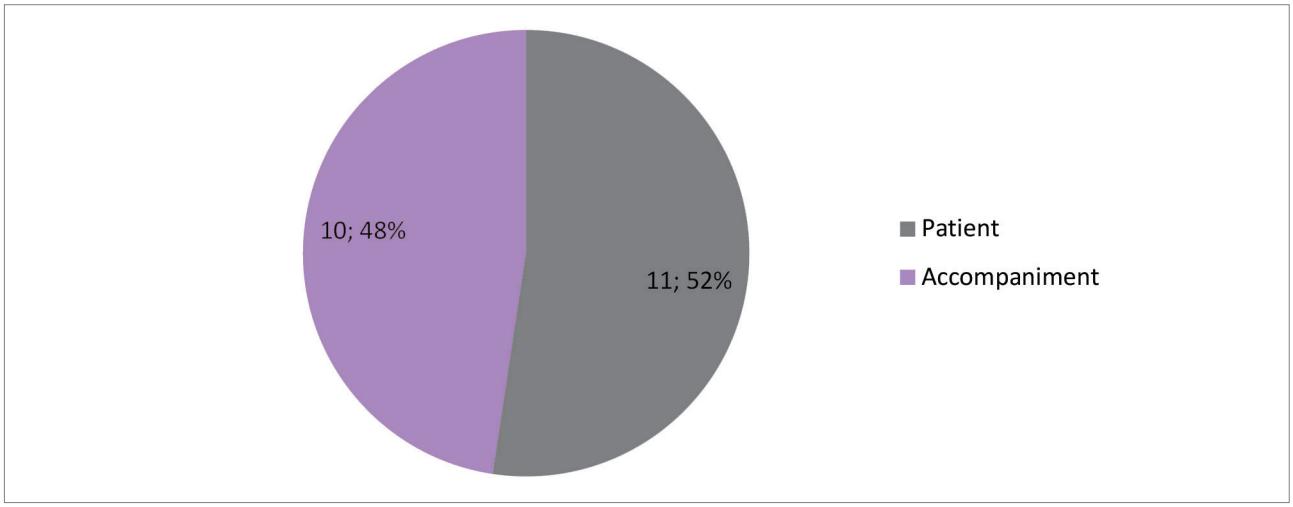
For all of complaints regarding nurses, 48% pertains to patients and the 52% pertains to patient's accompaniments. The difference, given who filed a complaint about the work of a nurse (a patient or accompaniments), was not statistically significant: : χ^2 = 0.047; df = 1; p = 0.827.

Regarding anonymity, 90% pertains to the complainants without a full name, and the 10% were not anonymous complainants. The difference given the anonymity of the complaints is statistically significant in relation to the complaints that contained the identification data of the complainant: χ^2 = 13.762; df = 1; p = 0.000: a significantly smaller number of complaints was filed anonymously.

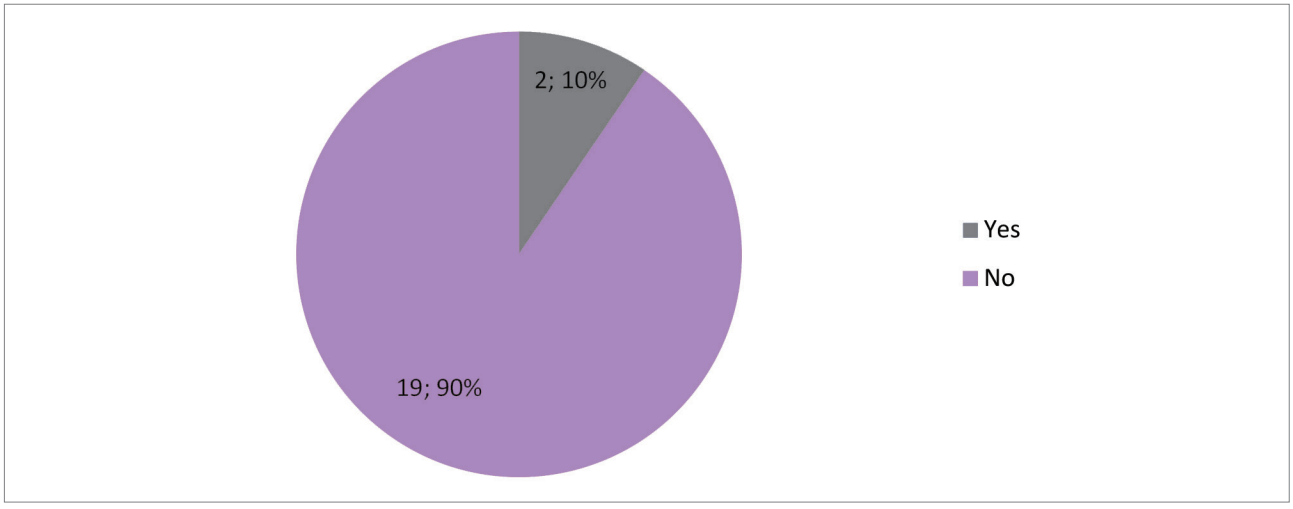
According to the complainant's sex, 86% of all complainants are females, and 14% are males. The difference, given the sex of a person who filed a complaint about the work of nurses, is statistically significant: χ^2 = 10.714; df = 1; p = 0.001: women significantly more filed complaints.

A patient characterized inappropriate communication towards him by the following example: „Nurse's answer to my question was unprofessional, and in one moment I even saw her rolling her eyes." Inappropriate care and inappropriate behaviour and also violation of patient rights was described by a patient: „Nurse acted very unprofessional and did not provide needed privacy while doing a physical examination."

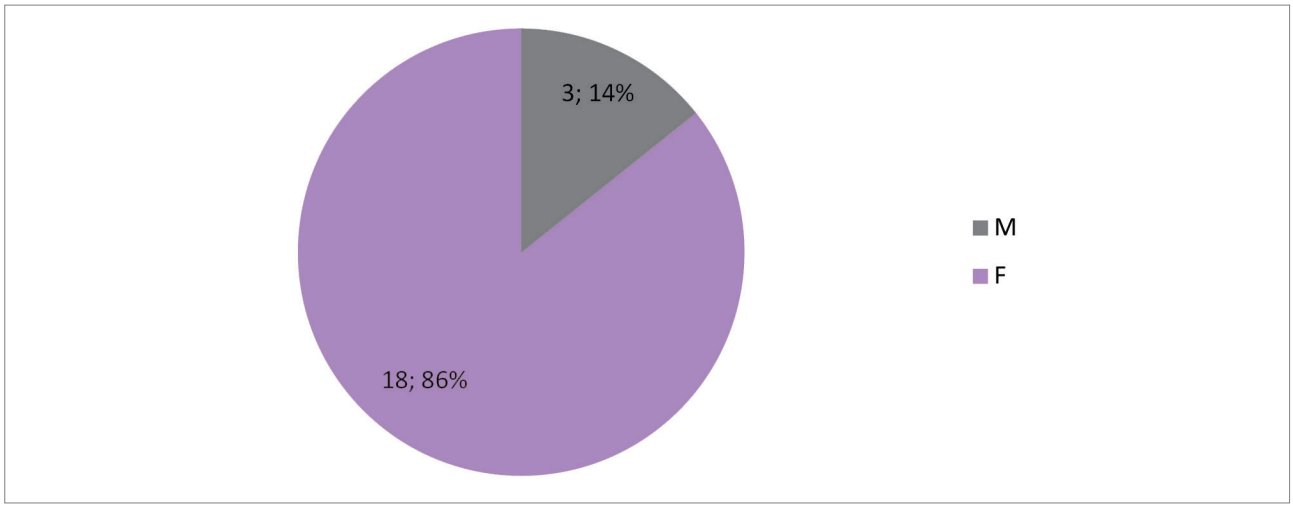
All complaints were submitted via the internet pages of UHC Sestre milosrdnice.



Graph 1. **Distribution of complaints by applicant**



Graph 2. **Distribution of complaints regarding anonimity**



Graph 3. **Distribution of complaints regarding complainant's sex**

Discussion

The results of this analysis regarding the frequency of complaints in the field of health care are satisfactory in relation to the frequency of complaints in other research. This percentage is much lower than the percentage of nursing complaints reported in a survey conducted at a regional hospital which was 35.7% (23). A higher percentage of complaints about nurses was in a research conducted in the United Kingdom. In this study conducted in 24 hospitals, out of 526 complaints, 142 (27%) referred to nurses (17).

The analysis of complaints in this research found that, considering the areas of patient complaints, complaints in the field of communication are frequent in other researches, but differences have been found in relation to research that have been studying complaints in areas where health care is provided (21). Various studies lead to specific conclusions and areas where needed to be improved (11,17,23,24). These differences are precisely the confirmation that patient complaints can identify critical points in the healthcare system of each institution. Most complaints have been referring to nurses who work in polyclinics mostly because there is greatest patient flow rate, sudden events often occur there and patients often wait for a long time to get to the doctor. These situations increase the patient's dissatisfaction and often cause misunderstandings.

Based on the analysis of patient complaints in UHC Sestre milosrdnice, quality improvement activities have already started. Responsible staff have regular meetings with employees where they deal with problems and try to find out what can be done to make patients feel more secure and satisfied with the service they get. Every employee is notified (nurses) when a complaint refers to them. Also, four training cycles have been held: „Communication skills in the daily work of healthcare workers". This training was intended for people who are in close daily contact with the patient (primarily staff who work at polyclinics, which is largely made up of nurses). In addition to the lectures, workshops were held where participants exchanged experiences and gained the opportunity to use an anonymous survey to visualize the problems that arise in the work of staff at polyclinics and outpatient facilities.

Through this research, which included patient health complaints analysis, it was found that apart from communication, it is important to pay attention to the awareness of nurses about the importance of their professional behavior, including the rights of patients. Additionally, a hypothesis that there are differences in the categories of complaints was also been confirmed.

This knowledge is one of the next challenges in improving the quality of nursing care for UHC Sestre milosrdnice.

This research has one disadvantage and it is that it was conducted in only one hospital so we cannot

generalize it. However, this research is a small step forward to raise awareness of this issue in the nursing profession, as well as the incentive to approach this area more seriously. Data obtained by research is important for all nurses regardless of the field they work in because they play a significant role in ensuring quality health care. By managing the quality of health care, special attention should be paid to patient complaints, to consider the messages received by their analysis, and to use guidelines and recommendations on best practice in this area.

Conclusion

Patient complaints may point to the various problems that arise in the process of providing health services, especially nursing care. They can describe areas of risk for patient safety, they can be the basis for resolving dissatisfaction, creating areas for changes and preventing future problems. This analysis has provided some insight into complaints about the work of nurses and can point to critical areas in their daily work. In this analysis the most common category has been in the domain of communication, it was found that this area was a priority. Due to the importance and impact of complaints about the quality of nursing care, it is necessary to continuously monitor and analyze them.

This research is a small attempt to raise awareness of the importance of the nursing profession and the role of consideration and analysis of patient complaints in improving the quality of health care.

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PRITUŽBE PACIJENATA – ALAT ZA UNAPRJEĐENJE KVALITETE SESTRINSKE SKRBI

Sažetak

Uvod. Pritužbe pacijenata ukazuju na nezadovoljstvo pacijenata zdravstvenom uslugom (zdravstvenom njegom i sl.). Neadekvatno postupanje s pritužbama pacijenata može rezultirati negativnim posljedicama za ustanove, ali i djelatnike uključene u proces zdravstvene skrbi. Zdravstvene ustanove u Republici Hrvatskoj dužne su propisati postupak upravljanja pritužbama pacijenata, koji mora zadovoljavati određene kriterije. U skladu s tim kriterijima, ustanove mogu uvesti vlastiti način postupanja s pritužbama pacijenata. Postupak uključuje praćenje, analizu i korektivne radnje na temelju analize pritužbi. Medicinske sestre čine veliki broj zaposlenika zdravstvenih ustanova (posebno bolničkih) i njihove usluge znatno pridonose cjelokupnoj kvaliteti njihovih usluga te su važan čimbenik u osiguranju kvalitete i pozitivne percepcije zdravstvene usluge. Stoga je važno upravljati pritužbama i u području zdravstvene njege.

Cilj. Cilj je ovog rada istražiti upravljanje pritužbama u području zdravstvene njege, prikazati način upravljanja pritužbama u KBC-u Sestre milosrdnice, izvršiti analizu pritužbi pacijenata, s posebnim naglaskom na pritužbe koje su se odnosile na rad medicinskih sestara.

Metode. Provedeno je pretraživanje baza podataka u cilju pronalaženja literature iz ovog područja i retrospektivna analiza pritužbi pacijenata podnesenih kroz bolnički sustav prijave pritužbi/pohvala u razdoblju od 1. siječnja do 31. prosinca 2017.

Rezultati. U navedenom razdoblju zaprimljeno je i analizirano 147 pritužbi i 132 pohvale. Od ukupnog broja pritužbi, 21 (14 %) se odnosila na medicinske sestre. Većina pritužbi (66 %) odnosila se na medicinske sestre zaposlene u poliklinič kој djelatnosti. Pritužbe su u najvećoj mjeri ukazivale na nezadovoljstvo komunikacijom (40 %) te, po mišljenju pacijenata, na neprimjeren odnos prema njima (31 %).

Zaključak. Dobiveni rezultati predstavljaju smjernice za provođenje daljnjih mjera za poboljšanje kvalitete zdravstvene skrbi u ovom području.

Ključne riječi: pritužbe pacijenata, upravljanje, medicinske sestre, kvaliteta

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The Ways of Development of Nursing as a Separate Health Profession: a Comparative Analysis of Legislative in the Nursing Profession in Bosnia and Herzegovina and Countries in the Region

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Keywords: nursing, Bosnia and Herzegovina, health care, health legislation, nursing practice

Abstract

Introduction. The rising need for quality health care, increased workload, accountability and healthcare reforms, are factors that resulted in growing requirements for recognition of the nursing profession, which are clearly defined in the Munich Declaration (2000). Unfortunately, in the current health care system in most of the transition countries of the Region of the South East Europe, nursing is still not adequately validated as a special profession.

Aim. Presentation of legal solutions related to nursing profession in Bosnia and Herzegovina (B&H) from the aspect of definition of nursing activities, education standards, licensing and labor mobility.

Methods. Desktop analysis as a method of quality research of legislative and strategic documents related to nursing in B&H.

Analysis of the directive and legislation in the countries of the region and the EU**.**

Comparison with the legislation of B&H.

According to the constitutional solutions, within the competence of the Entities (Republic of Srpska), the area of health care in B&H is divided by the competencies of the entities and cantons (the Federation of B&H), that is, within the competence of the Brčko District of B&H, therefore, there is also a separate entity legislation. In 2013, the Government of the Federation of B&H adopted the Law on Nursing and Midwifery and secretly defined the nursing domains in accordance with the EU directives. In the Republic of Srpska and the Brčko District, this is partly defined in the systemic health care laws (amended in 2015).

Conclusions. In all the legal acts reviewed, there are still shortcomings in the defined domains for the nursing profession. By addressing these issues, the progress of nursing development would speed up, strengthen and modernize the health system, which would undoubtedly increase the quality of health care to a higher level.

Introduction

The rising need for quality health care, increased workload and accountability, are factors that resulted in growing requirements for recognition of nursing and consequent health care reform. Relating to medicine as a science and profession, nursing must be defined as a specific branch of medical science, which has its own and completed framework of knowledge, methods, procedures and skills, as a part of the entire medical science.

As a logical sequence of these demands, the Vienna Nursing Conference, 1988 and the Munich Conference, which further strengthened the status of nursing profession, were held. At the Munich Conference, the Munich Declaration 2000 was also adopted (1).

Conclusions from these conferences became a guide to the legislative authorities of transition countries, such as the Southeastern European countries, which, through strong socio-economic reform processes, have begun to work on the development and advancement of nursing legislation and the advancement of nurses' position in Europe, as independent and interdependent professionals.

Furthermore, the European Union (EU) has defined the processes and norms of nursing education. The health systems of all EU Member States should be adapted to the global health system of the EU and achieve the prescribed and recognizable quality of health education. Implementation of those reforms requires the fulfilment of the Guidelines of the World Health Organization - Regional Office for Europe, European Union Directives (2005/36/EC and 2013/55/EC), and the Guidelines on the recognition of professional qualifications (2, 3).

Unfortunately, in the current health care system in most of the transition countries of Southeastern Europe and the Western Balkans countries, nursing is still not adequately validated as a special profession.

The aim of the paper is to analyze the legal and strategic solutions related to nursing and offered through legislation in Bosnia and Herzegovina (B&H) from the aspect of definition of nursing activities, education standards, licensing and labor mobility. By harmonizing these domains with EU standards, it can contribute to further strengthening the nursing profession, increasing the mobility of nursing workforce, and improving the health care system in which nurses are an essential part, both as participants and as policymakers.

The health of the population is undergoing significant changes in the current conditions of altered socio-environmental factors, the increasing challenges and risk factors in the environment, the new pathology, the need to strengthen health promotion and disease prevention, and bring new therapeutic approaches (4). Continuous monitoring and strengthening of health care is necessary. Consequently, the role of a nurse as a health care manager, from the planning, organization, management and control process is immeasurable in the health system of each country.

There is not a single healthcare profession that treats individuals of all ages, families, groups and communities in a more comprehensive way, sick or healthy in all environments, such as nursing. Nursing involves health promotion, disease prevention, and care for sick, disabled and dying people. In addition, the key roles of nursing are the promotion of a healthy environment, research, participation in shaping health policy and managing hospital and health systems as well as education. Therefore, strengthening the profession of nursing is also a necessity and a need for the improvement of health systems in all countries of the world.

Starting from the premise that health systems in countries all around the world are part of a global international health system, the EU, as an intergovernmental and transnational community of European states, emerged through the process of cooperation and integration, continuously implements the process of adapting health systems of all EU member states to the global health system and strives to achieve a recognizable quality of health education.

Methods

- Desktop analysis* as a method of quality research of legislative and strategic documents related to nursing profession in B&H
- Analysis of directives and legislation in the countries in the region and the EU
- Comparison with B&H legislation

Directive 2005/36/EC of the European Parliament and of the Council on the Recognition of Professional Qualifications (2), (Directive 2005/36/EC) and its upgrading the Directive, Directive 2013/55/EC are two key EU Directives on Independent Professionals Of the European Parliament and of the Council on the Recognition of Professional Qualifications amending Directive 2005/36/EC on the recognition of professional qualifications and Decision (EU) no. 1024/2012 on administrative cooperation through the Internal Market Information System (3) (Directive 2013/55/EC). These Directives contain standards that are the basis for the adoption of various legal acts in the field of nursing. In addition, the Bologna Declaration of June 1999 launched a series of reforms needed to make higher education in Europe more compatible and more comparable, more competitive and more attractive to its citizens and to citizens and scientists from other continents. Among the main objectives are the development of a progressive convergence of the overall framework of educational titles and cycles in the open European Higher Education Area, as a development of a framework for quality assurance across the EU in the field of higher education. All this creates opportunities for increased workforce mobility, exchange of experience and knowledge, as well as increasing efficiency and effectiveness in the functioning of independent professions.

Bosnia and Herzegovina, as a signatory to the Stabilization and Association Agreement (SAA) (5), has moved from the phase of voluntary harmonization to the stage of mandatory harmonization with EU regulations, which means that above mentioned directives must be respected in terms of regulating the status of professions.

According to the constitutional solutions, within the competence of the Entities (Republic of Srpska), the area of health care in B&H is divided by the competence of the entities and cantons (the Federation of B&H), that is, within the competence of the Brčko District of B&H, and therefore there is a special entity legislation (6,7,8) complicated state system, poor coordination of competent sectors and many other problems, the process of harmonization of health laws will have to take place in those phases.

The best example of this phase approach to solving the harmonization problem is the adoption of the special Law on Nursing and Midwifery of the Federation of B&H (Official Journal of the FB&H 43/13) (9).

The basic goal of this law is to regulate the profession, i.e. define the activities, competencies, standards of education, licenses and other domains in order to place this profession in B&H at the same level with other regulated professions in health care. This would make nurses equal in rights and obligations with their counterparts in the EU, which would also enable the mobility of the personnel and the basis of this profession, the satisfaction of the end user or the patient. The law is mutually beneficial, both for nursing and for patients, and this is reflected in the following:

- providing professional, efficient and effective nursing services for patients,
- informing the patient about the possibilities of choosing services,
- guarantee of quality of services,
- encouraging the development of the profession,
- recognition of the expertise, identity and social position of nurses.

Through the Law, the nursing domains are clearly defined in accordance with EU Directives. Although not fully harmonized with European legislation, the part that could be harmonized is harmonized, and the part that is not harmonized due to existing obstacles will wait for the solution of these problems.

In the Republic of Srpska and the Brčko District, this is partly defined in the systemic health protection laws (7, 8).

Also, Directives 2005/36/EC and 2013/55/EC (2,3) provide the basis for mobility in the European labor market for sectoral professions, including nurses. Labor market mobility requires university education of

* The desktop research method involves searching, analyzing and structuring information obtained from relevant sources.

nurses, that is, those health professionals who will allow the patient to get the best possible health care in the shortest possible time. Otherwise, patient safety is endangered as well as the efficiency and further development of the profession as such (11).

Therefore, the nursing profession is becoming more demanded in the EU labor market, due to the increased need for quality health care. Similarly, Directives 2005/36/EC and 2013/55/EC prescribe possession of a European Professional Card which is an important document for nursing whose introduction is facilitated by greater mobility of experts, in particular by accelerating the exchange of information between the host Member State and the Member State of origin. The European Professional Card should enable career tracking of experts in different Member States. One of the conclusions of the conference of the European Federation of Nursing Associations, held under the Modernization of the Professional Qualifications Directive: Safety in Mobility 2014 (12), is that: "The European Professional Card should be an instrument in the fight against unemployment, an important factor in building confidence among regulatory bodies, government recruitment services and professional associations ".

Unfortunately, it must be noted that nurse migration is a very common occurrence today and that the most common reasons for it are: improving the financial situation, further education, career advancement and better working conditions. This is a growing problem, especially in the small Southeastern European and the Western Balkans countries, because the continuation of this trend will have negative effects, which is the inequality and inequality in the accessibility of this profession.

Since B&H has ratified the SAA (5) with the EU in 2008, and has committed itself to comply with EU regulations, in Chapter V of the Agreement "Movement of workers, establishment, provision of services, capital movements" it is very clearly indicated which conditions of B&H in order to join the EU, especially in the part describing the movement of workers. Fulfilling the requirements of these Directives ensures equality of nursing personnel in the EU.

Results and Discussion

The License

The license domain is regulated by automatic recognition of qualifications through Directive 2005/36/EU (2). This Directive allows Member States, in accordance with their own rules, to accord to third-country nationals the professional qualifications acquired outside the EU area. In each case, the minimum conditions for training for certain professions should be respected. Member States should retain the right to establish a minimum level of qualification to ensure the quality of services provided in their national territory. Furthermore, the Directive states that national education and training programs should be classified according to degrees in order to define a mechanism for the recognition of qualifications within the general system.

The Federation of B&H has solved licensing of professionals, both for its citizens as well as for foreign nationals and citizens of the EU Member States, through the Rulebook on Licensing Procedure, Content and Appearance of the License (10). By obtaining the license, the healthcare worker acquires the right to perform independently in his profession. The healthcare worker carries out the affairs of his profession only within the scope of his professional title as determined by the license issued by the competent chamber. The adoption of the regulations on licenses in the Federation of Bosnia and Herzegovina is one of the steps towards the EU approximation, and in the light of meeting the recommendations from Directive 2005/36/EC (2), which is a positive example in harmonizing B&H legislation with European health legislation.

Republic of Srpska and the Brčko District in B&H do not have special regulations on licenses for health professions, but the domain of the license is regulated by the Health Protection Law of Republic of Srpska ("Official Journal of Republic of Srpska", No. 106/09) (7).

The Brčko District has regulated the domain of the license by the Health Protection Law in the Brčko District of Bosnia and Herzegovina ("Official Journal of Brčko District of B&H", No. 38/11) (8).

Table 1. **Normative definition of the domains of mobility in B&H in comparison with EU Directives**

Bosnia and Herzegovina	Legislation	Status According to EU Directives Directive 2005/36/EC Directive 2005/36/EC
Federation of Bosnia and Herzegovina	Rulebook on the Conditions and Manner of Recognizing the Internship and the Professional Examination of Healthcare Workers carried and passed abroad (2012) Rulebook on Licensing Procedure, Content and Appearance of the License (2013), Articles 9-10 Rulebook on Additional Education in Family Medicine (2011), Articles 18-20 Rulebook on Conditions, Organization and Mode of Work of Emergency Medical Assistance (2013), Articles 57- 58, Rulebook on Continuing Professional Education in Health Management (2011), Article 28 Rulebook on Education in the Field of Transfusion Medicine for Nurses / Technicians and Laboratories (2011), Articles 13-15 The Nursing and Midwifery Act (2013), Article 18, Article 25, paragraph 4.	*Partially fulfilled*
Republic of Srpska	Rulebook on the Program and Procedure for Taking the Professional Exam (2011), Articles 21-22, Rulebook on Additional Education in Family Medicine (2003) Article 17	*Not fulfilled*
Brčko District	Health Care Law of Brčko District (2011) Article 120	*Not fulfilled*

Education standards

The European Union has also defined the standards of education for nurses by Directive 2013/55/EC (3).

The nursing profession has developed considerably over the past three decades: community health care, the application of more complex therapies, and the constantly evolving technologies presuppose the capacity for greater responsibility of nurses. In the EU countries, under the influence of various political, economic, social, demographic and cultural trends, the need for a serious reform of the health care system in which nurses have one of the leading roles has been shown. The nursing profession possesses unique knowledge in improving the health and health care of sick people and palliative care, and advancements in technology and science require a high level of education for nurses. Respecting the Directives of the European Council and Parliament in which the processes and norms of nursing education are precisely defined, Member States have equated the competencies and level of the education of nurses.

Undergraduate and postgraduate curricula in schools and universities of health care in B&H, as well as the

Table 2. **Normative definition of the license domain in B&H in comparison with EU Directives**

Bosnia and Herzegovina	Legislation	Status According to EU Directives Directive 2005/36/EC Directive 2005/36/EC
Federation of Bosnia and Herzegovina	Rulebook on Licensing Procedure, Content and Appearance of the License (2013)	*Partially fulfilled*
Republic of Srpska	Health Care Law (2009)	*Not fulfilled*
Brčko District	Health Care Law of Brčko District (2011)	*Not fulfilled*

Table 3. **Normative definition of domain standards of education in B&H in comparison with EU directives**

Bosnia and Herzegovina	Legislation	Status According to EU Directives Directive 2005/36/EC Directive 2005/36/EC
Federation of Bosnia and Herzegovina	Nursing and Midwifery Act (2013) Article 19-20.	*Partially fulfilled*
Republic of Srpska	Health Care Law (2009) Article 83, 84, 86-87.	*Partially fulfilled*
Brčko District	Health Care Law of Brčko District (2011) Article 112, paragraph 1 Articles 121.-122.	*Partially fulfilled*

profession of nurses, are gradually aligned with reforming needs and health system needs and harmonized with EU standards that include the WHO and Bologna process, in order to facilitate, among other things, the mobility of the workforce and increase the standard of quality of health care services.

Despite numerous initiatives, there is still insufficient cooperation between health sectors, education and the labor market in B&H, which slows down the reform processes.

Conclusions

1. Significant steps have been taken in B&H regarding the definition of nursing as a special profession, especially in the Federation of Bosnia and Herzegovina, by adopting a special Law on Nursing and Midwifery in 2013, as well as relevant by-laws in both Entities of B&H and the Brčko District.
2. However, although all these legislative acts aim to promote the profession of nursing and patient satisfaction, there are still insufficiently defined domains in this profession to be processed, all of which still leave room for the stagnation of the profession and its slow progress.
3. The involvement of the competent chambers in the adoption of all the missing legal and secondary legislation is of key importance for improving the conditions for performing professional activities, protection of professional interests, organized participation in the improvement and implementation of health care and protection of citizens' interests in exercising the right to health care.
4. Accelerating the introduction of uniform education standards for this profession and the system of recognizing professional qualifications, based on harmonized minimum educational conditions would greatly facilitate the provision of better quality and secure services. Establish a single curriculum in health universities in B&H that will be in line with Directives 2005/36/EC and 2013/55/EC.
5. Access a European Professional Card project which enables freedom of movement in the labor market in Europe.
6. In the forthcoming period, stronger mechanisms of coordination and closer cooperation between sectors, health, education and labor markets in B&H should be established, with the aim of ensuring an adequate number of quality personnel. Addressing this problem will enable further advancement of the professions and will increase the mobility of the personnel, that is, the profession that will be recognized and equally everywhere in Europe.
7. Strengthen the roles of professional chambers of nurses as independent, professional organizations with legal personality. This is necessary for the purpose of clearer recognition of the profession.
8. By harmonizing these domains with EU standards, it can contribute to further consolidating

the nursing profession, increasing the mobility of nursing workers, and improving the health care system in which nurses are an essential part of it and both as participants and policy-makers.

9. Considering the same or similar issues in the countries of the region, it is proposed to establish an inter-state professional association of nurses to monitor progress in harmonization with EU directives regarding the promotion of nursing as an independent profession.

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PRAVCI RAZVOJA SESTRINSTVA KAO SAMOSTALNE ZDRAVSTVENE PROFESIJE: KOMPARATIVNA ANALIZA LEGISLATIVE U SESTRINSTVU BOSNE I HERCEGOVINE I ZEMALJA U REGIJI

Sažetak

Uvod. S povećanjem potreba za kvalitetnom zdravstvenom njegom, povećanjem obima posla i odgovornosti te reformama u zdravstvu rasli su i zahtjevi za determiniranjem domena u profesiji sestrinstva, što je jasno definirano u Minhenskoj deklaraciji (2000.). Nažalost, u sadašnjem sustavu zdravstvene zaštite u većini tranzicijskih zemalja regije jugoistočne Europe sestrinstvo i dalje nije adekvatno validirano kao posebna profesija.

Cilj. Prikaz zakonskih rješenja povezanih sa sestrinstvom, a ponuđenih kroz legislative u Bosni i Hercegovini (BiH) s aspekta definicije sestrinske djelatnosti, standarda obrazovanja, licenciranja i mogućnosti mobilnosti radne snage.

Metode. Desktop analiza legislativnih i strateških dokumenata povezanih sa sestrinstvom u BiH.

Rezultati. Oblast zdravstva u BiH prema ustavnim je rješenjima u nadležnosti entiteta (Republika Srpska), podijeljenoj nadležnosti entiteta i kantona (Federacija BiH), odnosno u nadležnosti Brčko Distrikta BiH, stoga postoji i zasebna entitetska legislativa. Vlada Federacije BiH 2013. godine donijela je Zakon o sestrinstvu i primaljstvu te tako jasno definirala domene u sestrinstvu, u skladu s direktivama EU-a. U Republici Srpskoj i Distriktu Brčko ovo je dijelom definirano u sustavnim zakonima o zdravstvenoj zaštiti.

Zaključak. U svim pregledanim zakonskim aktima još uvijek postoje nedostaci u definiranim domenama za sestrinsku profesiju. Rješavanjem ovih nekompletnosti, progres razvoja sestrinstva ubrzao bi, ojačao i modernizirao zdravstveni sustav, što bi nesumnjivo podignulo kvalitetu zdravstvene zaštite na višu razinu.

Ključne riječi: sestrinstvo, Bosna i Hercegovina, zdravstvena zaštita, zdravstveno zakonodavstvo, sestrinska praksa

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Intravenous Immunoglobulin Replacement Therapy in Children with Primary Immunodeficiency Diseases: A Nurse's Guide

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Abstract

Primary immunodeficiency diseases are chronic disorders which are characterized by increased sensitivity of the organism to infections because one or more parts of the body's immune system is missing. Immunoglobulins are normal components of the human body with the main role in the immune defense. Children with primary immunodeficiency have little or no antibodies and lifelong routine replacement therapy is the only effective treatment which represents the gold standard in treatment. The purpose of this therapy is to prevent acute infections and reduce complications resulting from infection. A nurse equipped with knowledge and competences is an indispensable link in the safe and quality administration of immunotherapy and in providing immediate psychological support to the child and the entire family. Nurses administer 90% of all intravenous immunoglobulin therapy transfusions according to the provisions of the physician.

The paper presents findings of a research study into nurse´s perceptions about the Immunoglobulin replacement therapy. This paper represents nursing guidelines before, during and after administering intravenous immunoglobulin in children with primary immunodeficiency disease.

Introduction

Primary or congenital immunodeficiencies (PID) are caused by genetic defects which in turn interrupt the maturation and functioning of various components of the immune system. Immunodeficiency may be independent or linked to a syndrome. The diseases are usually already present in infancy and childhood and are manifested as common (recurrent) or unusual infections. They are characterized by a lack of antibodies (agammaglobulinemia), antibody deficiencies (hypoglobulinemia) and a lack of specific subclasses of immunoglobulins (normoglobulinemia). These children are immunocompromised against all opportunistic infections and are also prone to allergies and autoimmune diseases.

More than 250 PID entities have been defined to date, with the number rapidly evolving (1,2).

This paper will review certain anecdotal evidence for indications and administration of intravenous immunoglobulin (IVIG). In additional to the review in the table further on, the adverse effects of IVIG therapy and interventions by nursing personnel is addressed.

The goal of IVIG infusion in nursing practice should be to deliver therapy safely and effectively. A nursing policy should be in place for treatment and management of all adverse reactions.

Immunodeficiency

Immunodeficiencies should be suspected as the cause of recurrent infections when atypical signs and symptoms occur (recurrent otitis media after antibiotic treatment, chronic recurrent rhinosinusitis, persistent pneumonia after adequate therapy with antibiotics), when usually accompanied by complications and resistance to treatment, or in the case of infections caused by unusual microorganisms.

Infections of the upper and lower respiratory tract are the most commonly reported symptoms (sinusitis, bronchitis, pneumonia), as well as gastroenteritis, but serious bacterial infections such as meningitis may also occur. Immunodeficiency should be suspected in infants or small children with chronic diarrhea and growth delay, especially when diarrhea is caused by unusual viruses such as, for example, adenoviruses (3). Frequent use of antibiotics may at times mask many of the common symptoms and signs of infection (4). Due to the weakness of the immune system, changes in skin and mucous membranes are commonly reported (e.g., eczema, warts, abscesses, pyoderma, oral and esophageal ulceration, and periodontitis). After thoroughly reviewing a patient's medical history, undergoing a physical examination and taking blood tests, a final confirmation of diagnosis is possible based on the results of immunological and genetic tests.

Given that recurrent infections are the main problem, several specific types of therapy are available for children with a primary immunodeficiency disease where such therapies strengthen immunity. One of these is replacement therapy for missing components of the immune system. Replacement therapy can also include IV immunoglobulin and hematopoietic stem cell transplantation.

IVIG therapy

Intravenous immunoglobulin therapy is a human antibody solution which has been used as a medical treatment for decades. However, its use has increased over the last few years due to good responses in the body when treating various diseases. As was the case with prophylaxis for measles, hepatitis and polio, the concentration of human IVIG began to be used as early as World War II. Most often, the therapy was administered only subcutaneously and intramuscularly (5).

Immunoglobulin preparations are extracted from the serum of 1,000-60,000 voluntary healthy donors, a combination of several thousand donors depending on the manufacturer (6,7) who go through screening for possible infections such as hepatitis B, C and HIV. The WHO has published minimum standards for manufacturing IVIG preparations (7):

- IVIG should be extracted from a pool of a least 1000 individual donors
- IVIG should contain as little IgA as possible
- IVIG should be free from preservatives or stabilizers that might accumulate in vivo

The preparations contain highly purified (> 95 %) polyvalent IgG (8).

Immunoglobulin G is prepared from the fractionation of a large amount of normal human plasma and contains a wide spectrum of antibodies (9).

It may take several infusions to develop a tolerable specific IVIG regimen for each patient. While all Ig products provide necessary antibody replacement, each has subtle differences and are thus not interchangeable because switching from one brand to another is one of most common causes of side effects (10).

Adverse reactions

Although all donors are required to undergo screening, there is possibility that late complications may occur, such as more severe infections, after taking blood before seroconversion (11).

Like any other form of treatment, the use of immunoglobulins presumes a certain risk of adverse events and side effects. The side effects of IVIG treatment relate mainly to the dosage and rate of administration. Reactions are categorized as early and late reactions based on reaction times, while the criterion for the reaction onset mechanism leads to the twofold categorization, specifically immune-related and non-immunological. Early side effects occur within 30-60 minutes after commencing administration (12,13), while Richter (2005) notes that hepatitis, HIV, meningoencephalitis are possible late reactions given that immunoglobulins are obtained from various volunteer blood donors (11,14). Side effects may be mild, moderate or life-threatening depending on the clinical condition (Table 1).

Mild reactions include dizziness, headache and flashes of light in vision. Other symptoms such as fever, nausea, vomiting, joint pain and moderate back or hip pain may also occur (15,16). Moderate reactions include strong headaches that do not stop after the administration of analgesics, rashes with or without itching, and the exacerbation or recurred appearance of mild reactions. The most common delayed systemic reaction is persistent headache (17).

Flu-like symptoms are the most frequent adverse effects (18). One retrospective study showed that 14 of 16 (87.5%) patients developed flu-like symptoms during immunoglobulin administration (19).

As with other blood products, administration of immunoglobulins may lead to serious complications such as hemolytic anemia, anaphylactic reactions (13), renal insufficiency, aseptic meningitis (11, 20) and exacerbation of all moderate reactions. Fortunately, severe side effects are rare (15,21). Recognizing and preventing late reactions in a timely manner requires placing the child under observation for at least 24 hours. Constant hydration and taking of fluids is necessary for maintaining normal renal function. All symptoms and signs of allergic reaction must be documented.

Some of the necessary nursing procedures are given in Table 2.

Table 1. **Adverse Reaction to IVIG**

MILD (most common, usually immediate)	**MODERATE (common, usually delayed)**	**SEVERE (rare)**
Dizziness* Light headache* Flashes of light in vision* Fever* Nausea* Vomiting* Fatigue*	Persistent headaches** Rashes* Transient hypotension* Wheezing or chest pain*	Hemolytic anemia** Renal insufficiency** Aseptic meningitis** Anaphylactic reactions*: **Respiratory symptoms**: Chest pain, clenching in the throat, a sense of lacking air, bronchospasm, saturation below 94%, rhinitis, dry cough, angioedema, harsh voice, stridor **Abdominal symptoms**: Abdominal pain, cramps, diarrhea, nausea, vomiting **Circulatory**: Hypotension, tachycardia, pale and damp skin **Other**: Itching, redness of the skin on the neck, face and ears, watery eyes

* Immediate reaction—within six hours from onset of infusion
** Delayed reaction—six hours to one week after infusion

Table 2. **Nursing interventions in case of unwanted reactions (18,19,21-24)**

UNWANTED REACTIONS	CAUSES	NURSING INTERVENTIONS
MILD REACTION	First infusion Infusion rate may be too fast Solution is not at room temperature Longer interval from prior infusion Switch to a new product	Slow down the rate of administration or stop infusion for 15-30 minutes If necessary, apply analgesic therapy Assess pain on the pain scale If headaches persist after 30 minutes, stop the infusion permanently
MODERATE REACTION	Infusion rate may be too fast Solution is not at room temperature Inflammatory response to specific product No pre-infusion or post-infusion hydration	Slow down the rate of administration or stop the infusion for 15-30 minutes If the nausea does not stop after 30 minutes, stop the infusion Administer antiemetics if necessary Administer antihistamines and NSAIDs if necessary
SEVERE	Intolerance to product High-dose IVIG therapy	The infusion should be stopped immediately. In case of anaphylactic reactions administer adrenaline according to a clearly defined protocol In line with ERC guidelines, adrenaline must be administered intramuscularly in the anteromedial part of the upper leg as it maximizes absorption. Use of intravenous adrenaline should be performed only by physicians who are trained in administering vasopressors. Oxygenation and IV fluid replacement Continuous patient monitoring is important

Depending on the indication, doses are determined according to the child's body weight and the laboratory findings pertaining to immunoglobulin. Therapy is repeated at regular intervals every 3 to 4 weeks (17), and it takes 3 to 6 months to achieve balance after the beginning of therapy.

The most common side effects are expected during the first administration of intravenous immunoglobulins (21, 22). The rate of infusion is determined by ml/ kg per hour. Infusion rates are usually started at 0.01–0.02 ml/kg/min and increased up to 0.1 ml/kg/min (23).

Nursing interventions during first IVIG administration

Intravenous immunoglobulins are administered to children under hospital conditions in a strictly controlled environment, respecting all the rules for asepsis, and based on the physician's written order. Nurses administer the majority of immunoglobulin, in 90% of the cases (18). Prior to each IVIG administration, the nurse must be familiar with the specifics of the medicine and administration protocol and evaluate the existence and passage of the venous pathway, as well as the condition (size, elasticity, position) of the child's veins. IVIG are administered intravenously via an approved intravenous infusion pump. The American Academy of Allergy, Asthma and Immunology (AAAAI) strongly discourages the use of permanent indwelling ports or central venous lines in antibody deficient patients due to the risk of systemic infection (sepsis) and thrombotic events (25).

If IVIG is stored in a refrigerator, it needs to be warmed to room temperature (8) for at least 30 minutes before administration in order to minimize adverse effects. It must never be heated up in a microwave or in any other way as the protein may become denatured (8). Importantly, vigorous mixing is prohibited. All products should be inspected for the presence of particulates before pooling, and products with broken seals should not be used.

Education and moral support for the child and parents is very important. After a detailed medical history, physical examination and measurements

of vital functions, the child is placed in a bed on a ward equipped with a central oxygen supply. Given that administration, depending on the dose, lasts for several hours, the child should be pleasantly accommodated and wear comfortable clothing prior to commencing the treatment. Premedication is most often not necessary (8) but is usually given if there has been a recent adverse reaction (14).

Before using IVIG, it is necessary to check the correctness of the drug packaging, the name and expiration date, manner of administering and the concentration based on the instructions and compare them with the physician's written order. If the child is to receive a number of bottles, the starting time for administration and sequential position of the dose in the overall order of doses should be written on each bottle. To maintain records on the temperature list, the name and lot number of the drug should be documented, and the empty vials are to be kept for 24 hours after administering.

When the drugs are administered, emergency equipment including adrenalin (1:1000) must be readily available for life support purposes, and in case of an anaphylactic reaction (26).

Visual monitoring and baseline vital function monitoring is necessary during the first 30-60 minutes from commencing administration because most of the early side effects occur in that period. Subsequently, vital signs are measured every 60 minutes and this is obligatory before each new dose. All parameters in children should be constantly monitored and a skin examination for rash and urticaria should be performed periodically, as well as other symptoms and signs that may indicate unwanted reactions. Every change in normal vital signs should be recorded. An adverse reaction to administered immunoglobulin may also be related to infusion rate, and it is also important to comply with speed-related guidelines. A nurse records the intake and the amount of fluid, while encouraging the child to take as much fluid as possible to prevent renal complications (8,27).

Nursing interventions during recurrent infusion

Infusion of immunoglobulins is repeated at regular intervals every 3-4 weeks (8). During re-hospitalization, information should also be collected on previous use, possible complications (fatigue, headaches, nausea) and dosage toleration, including infection data during the three weeks following the last administration. Importantly, a child should be continually monitored if the last dose was administered more than 6 weeks ago (11), and if the infusion is administered from a new producer or if a higher dose is prescribed. For children, the best practice is not to change products once a particular brand has been commenced (14).

Nursing interventions after completing therapy

Physicians most frequently prescribe 0.9% NaCl infusion to flushthe infusion line after the administration of immunoglobulin. If at the site of the intravenous cannula there is no redness, edema and other inflammation signs, the cannula can be left until completing the observation. Conversely, the nurse must remove the cannula and treat the inflamed IV site according to the protocol provided by the institution. In this case, the cannula is to be placed in another position, preferably on the opposite extremity. The exact time of terminating infusion is noted in patient documentation along with all vital baseline parameters and description of the child's condition.

After the infusion administration, nurse must provide patient/family education before discharge, regarding symptom management and appropriate actions for symptom severity. It is also necessary to inform the patient about the next arrival date, respecting the protocol of the drug administration.

Psychological support for families

In comparison with healthy children and adults, patients with PID experience measurably lower general health along with higher hospitalization rates and restrictions to physical, school, and social activities (28).

When a child is diagnosed with PID, often each member of the family has many questions. The whole family must come to terms with the illness and perhaps make major changes in schedules and priorities. Parents are often faced with many challenges, difficulties and decisions that other parents will never have to face.

One of the most important things for the whole family is to provide accurate age-appropriate information and explain everything about the diagnosis, therapy and solutions. A child's understanding of their PID

depends on their cognitive development. Speaking with a child contributes to a sense of security and establishes trust between the nurse and child.

Some of the emotions that parents encounter are anger, guilt, embarrassment, sadness, loneliness, fear and confusion. Other feelings such as worry, stress and problems with sleep or appetite, a sense of loss and even a sense of relief are common.

Nurses must inform patients about the organizations that are raising the awareness of PID and offer support to individuals and families. Constant education of family and providing support are two of the most important roles due to the constant presence of fear and anxiety. Counselling sessions and mutual support groups are often the most appropriate forms of help where formal and informal caregivers are assisted in managing stress.

Conclusion

Primary immunodeficiency is not a rare occurrence; however, the real incidence and prevalence remains unknown until new screening tests for neonates are introduced. Today, frequent and recurrent infections are the usual signs of suspecting PID, and subsequently only tests designed for the final diagnosis. Occasionally, suspicions concerning the onset of the disease may take place earlier if a positive family history exists. An early diagnosis leads to timely treatment, disease prevention and better quality of life. To prevent frequent opportunistic infections, children with primary immunodeficiency diagnosis receive infusions of immunoglobulins at regular intervals in controlled conditions in a hospital environment, where nurses administer 90% of all IVIG transfusions in line with the physician's order. It is of utmost importance that nurses are educated about the type of immunoglobulin, the manner and rates of administration, possible complications and side effects, and that they are trained for timely response in such instances. Treating with immunoglobulin preparations is a demanding process in which all participants have an important role, starting with blood donors whose blood is processed in specialized transfusion facilities all the way up the chain to the child as the lifelong end user.

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NADOMJESNA TERAPIJA INTRAVENOZNIM IMUNOGLOBULINIMA KOD DJECE OBOLJELE OD PRIMARNE IMUNODEFICIJENCIJE: SESTRINSKE SMJERNICE

Sažetak

Primarne imunodeficijencije stanja su koja odlikuje povećana osjetljivost organizma na infekcije zbog nedostataka jedne ili više komponenti imunološkog sustava. Imunoglobulini su normalni sastavni dijelovi ljudskog tijela s glavnom ulogom u imunološkoj obrani. Djeca koja boluju od primarne imunodeficijencije imaju ih malo ili ih uopće nemaju te kod njih cjeloživotna nadomjesna terapija imunoglobulina (IgG) predstavlja jedini učinkovit tretman kao zlatni standard u liječenju primarnih imunodeficijencija. Svrha je takve terapije prevencija akutnih infekcija te smanjenje komplikacija nastalih kao posljedica infekcije. Medicinska sestra sa svojim znanjem i kompetencijama neizostavna je spona u sigurnoj i kvalitetnoj primjeni imunoterapije, u pružanju neposredne psihičke potpore djetetu i cijeloj obitelji te je upravo ona primjenjuje u 90 % slučajeva prema pisanoj odredbi liječnika.

Pregledom literature prikazane su spoznaje o percepciji medicinskih sestara u vezi s terapijom imunoglobulinima. Ovaj rad predstavlja smjernice medicinskim sestrama za skrb prije, tijekom i nakon primjene intravenskih imunoglobulina kod djece s primarnom bolešću imunodeficijencije.

Ključne riječi: primarne imunodeficijencije, nadomjesna terapija, medicinska sestra

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Improving Collaborative Work between Gastroenterology Ward and Drug and Alcohol Addiction Rehabilitation Service

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Abstract

Introduction. The need for developing this project was identified while working with multidisciplinary team at the Royal Berkshire Hospital in England, where it was apparent that healthcare professionals faced issues of providing continuous rehabilitation before and after discharging patients with drug and alcohol addiction from hospital.

Aim. To ensure that all team members on Gastroenterology Ward – occupational therapists, physiotherapists, nurses and therapy assistants – are competent to refer patients into the Community Drug and Alcohol Rehabilitation Centre – Integrating Recovery in Service (*IRIS); therefore improving collaboration with IRIS.

Methods. An initial study was conducted at the Royal Berkshire Hospital in England, between October and December 2017, while the evaluation study was conducted in the period between February and March 2017, on a sample of 20 respondents. The data was collected by means of a questionnaire which was created for the purposes of this study.

Results. After the analysis of the evaluation study results, 85% of the respondents considered that communication between the services improved, while 65% of the respondents attended the workshops and trainings organised by IRIS. Statistical significance ($p < 0.05$) was not observed in referring patients to IRIS ($p = 0.055$), this could be due to a small sample of respondents.

Conclusion. Team integration is key to implementing collaborative guidelines. The implementation of changes was based on increase in communication, organising trainings and further education, and referring patients to IRIS. Improvement in all categories greatly contributed to the increase in the competences of team members on the ward.

* IRIS – Integrated Recovery in Service

Introduction

Leadership in a multi-disciplinary team is inspired by the theory of system complexity, which recognises that every change occurs naturally within the institution (1). Good practice will expand faster through healthcare facilities if healthcare leaders follow the guidelines for making changes. One of the roles of a good leader is to devise a way of keeping good practice within the team (2).

Teams in health care need to start the process of change independently. For this purpose, it is possible to use the organisational capabilities of team members to develop professional relationships, regardless of the professional role (3).

Collaboration in healthcare

American surgeon and writer Atul Gawande identified that we currently live in a "century of systems" in which individuals and organisations cannot solve the problems they face alone (4). Gawande suggests designing new ways of team collaboration, through organisational systems, so that collective skills and knowledge are directed and exploited in the best way (4). National and international leaders are trying to achieve collaboration within and outside healthcare institutions (5). It is arguable that the main foundation of leadership is the mutual sharing of knowledge and information (5). Noticeable changes are made by developing new models and transformational plans (6). Leaders in health care are facing the demand for collaboration due to market changes and local competition. It should be stated that healthcare institutions are under great financial pressure (7). An example of governance development and collaboration between local authorities in Manchester and the United Kingdom National Health System, with the aim of long-term collaboration is described by Fillingham and Weir in a case study entitled "Living Better means Living Longer" (8). The idea was to create a multi-agency group with eight experienced healthcare managers who were due to work on a community development project. This group acted as a driver for new ideas and approaches to health management and leadership. Collaboration between healthcare institutions and community organisations has been improved, which has contributed to the development of new short-term and long-term programmes and projects in various health organisations (9). One of the great examples of collaboration is described through the experience of the Canterbury County Healthcare Clinic in New Zealand, which was facing problems of growing and aging populations (10). The members of the clinic and board leaders had to work together through the framework called "One System and One Budget" even though it was not just a single system or just one budget issue. In this case, the National Health Committee was a catalyst for regulating the work of clinicians, managers and other associates in organisational planning through an exhaustive process of collaboration between the services and the community. Final agreement was reached and based on a common vision in which patients had the main role. Hospital reconstruction, reduced hospital stays and investment in rehabilitation have been successfully implemented. None of the above would been possible if all participants had not worked together towards the same goal (10).

Clinical leadership programme

Healthcare professionals have the possibility of further training and education through various programs and workshops (11). Prior to developing any hospital and community-based projects, healthcare professionals attend the Clinical Leadership Program. This programme is created for professionals with various clinical experience and team leaders that want to expand knowledge and understanding of certain leadership styles. The United Kingdom Health Care Academy in collaboration with Hay Group and Open University has developed 9 Dimensions of Health Care Management Model (12). This model is based on evidence of secondary research conducted between March and April 2013 and primary research carried out between April and June 2013, reflecting the principles of health organisations, knowledge of health management, patient and community requirements (13).

The leadership model used during the development of this project is the ADKAR model (Awareness, Desire, Knowledge, Ability, Reinforcement), which is most commonly used when it is necessary to establish collaboration with community services. This model of change is a practical solution to the effective change that individuals and organisations can apply. It is useful to use and easy to learn. The model is based on the assumption that change is only successful once each individual within the organisations has succeeded in adjusting to that particular change (14).

As part of the Clinical Leadership Program, all participants must devise an innovative project that will contribute to the development of the institution they work in and use knowledge of various styles and leadership models. It is well-known that innovation alone can raise healthcare organisations to a higher level through coping with radical changes (15). Innovation is defined as the absolute novelty introduced into procedures and treatments, new teams introduced into existing teams and new frameworks that benefit patients, staff, organisations and the wider society (16).

Standardized self-assessment of management and leadership

The self-assessment was created for the purpose of assessing self-consciousness within the working environment. Results provide an insight into the current level of performance at the workplace. Self-assessment is based on 9 dimensions of team management through a model of management in health care (17). Self-assessment is a useful way of examining behaviours of healthcare professionals during project development. The ideal result should emphasise a high level of task performance closely related to the current role of a healthcare professional in the team. Healthcare professionals use this kind of self-assessment before starting new projects within the working environment and often as an evaluation after the implementation and completion of the project.

Launching the project

After investigation of rehabilitation facilities and community centres, it was concluded that the Royal Berkshire Gastroenterology Ward did not possess the necessary information about the relevant centres and thus could not apply a holistic approach to treatment and further rehabilitation. The department was lacking relevant leaflets, posters, information packages, and referrals that are essential to educating and supporting patients before discharge from hospital. Prior to the development of the project, it was necessary to check whether community health organisations are ready for change and if they support the change.

Finding partners for collaboration

When preparing an innovative project, it is necessary to find partners who are willing to collaborate. This may be someone completely new or even a partner with which a different kind of collaboration has been achieved in the past (18). Collaboration is defined through a shared vision, an ambition towards achieving the same goal, implementing joint leadership styles and shared responsibility for accountability (19). Examples of successful collaboration can often be demonstrated through the role of experts in various healthcare structures. The main partner when developing this project was the Community Drug and Alcohol Rehabilitation Centre – Integrating Recovery in Service (IRIS). Frequent meetings with the manager of IRIS were of utmost importance for the success of the project. Meetings have proven to be crucial when making decisions and developing guidelines for referring patients to IRIS as well as for developing long-term collaboration.

Community Drug and Alcohol Rehabilitation Centre – Integrating Recovery in Service (IRIS)

The centre is accessible to people over the age of 18, living outside the West London area. The Royal Berkshire Hospital had collaborated with IRIS in the past, but the collaboration was not very successful. Services provided by the IRIS are available to patients with drug and alcohol addiction and their families. IRIS promotes flexibility and the ability to change (20). The rehabilitation process begins with an initial assessment with the aim to identify current problems and causes of addiction. After assessing patient's needs, the team of professionals creates an individual plan, and sets short-term and long-term goals for every patient. Patients are not expected to go through the process alone, so they are given support from professionals and peers (21). Patients who have successfully passed the key aspects of the initial program go to the next stage called the abstinence program (21). This program is specifically designed for patients who are trying to reintegrate into the society. The program provides assistance with job search, further education, volunteering and also provides mentoring opportunities for patients who are at the beginning of a rehabilitation program by patients who have successfully completed their program in the past (21).

Implementing the change

The changes that were integrated after processing the data of the initial questionnaire were carefully analysed at expert meetings with the managers at IRIS.

Collaboration with the General Education Team within the hospital and the Educational Team at IRIS was established. The hospital in-service training team arranged dates for future workshops and lectures for a period of 6 months that will be available to staff monthly. Managers at IRIS had voluntarily agreed that the lectures will be held by their associates and lecturers. Guidelines needed to be developed to improve communication with IRIS. A poster with guidelines and essential contacts was designed to facilitate and speed up communication with IRIS. Posters were placed in visible areas in the department, in this case behind the reception area and close to the entrance door. Ward manager had named the contact person who will be responsible for future direct communication with managers at IRIS in the event of a lack of information and promotional material on the ward.

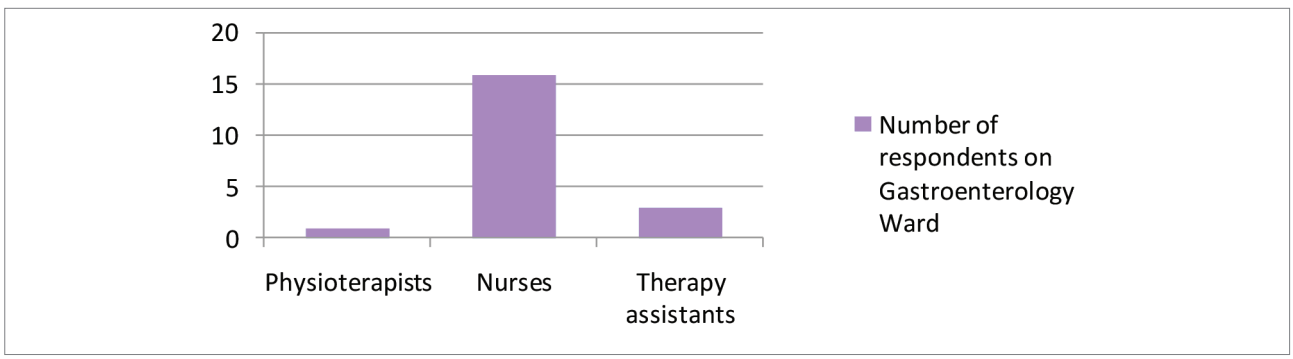
Methods

Initial research was conducted in England, on Gastroenterology Ward at the Royal Berkshire Hospital in the period between October and December 2017. The study was conducted with the help of a questionnaire composed of 7 questions. The questionnaire was created and conducted for the purpose of examining the quality of communication between the ward and the Community Rehabilitation Centre (IRIS), the relevant community education resources, and the methods and knowledge about referring patients with drug and alcohol addiction to community rehabilitation service. The questionnaire was filled out anonymously by physiotherapists, nurses and therapy assistants on the Gastroenterology Ward. The questionnaire was placed at the reception desk so that it was visually noticeable. Participation in the interview was supported by the head of department who verbally encouraged staff to fill in questionnaires on occasions when therapists were not present on the ward.

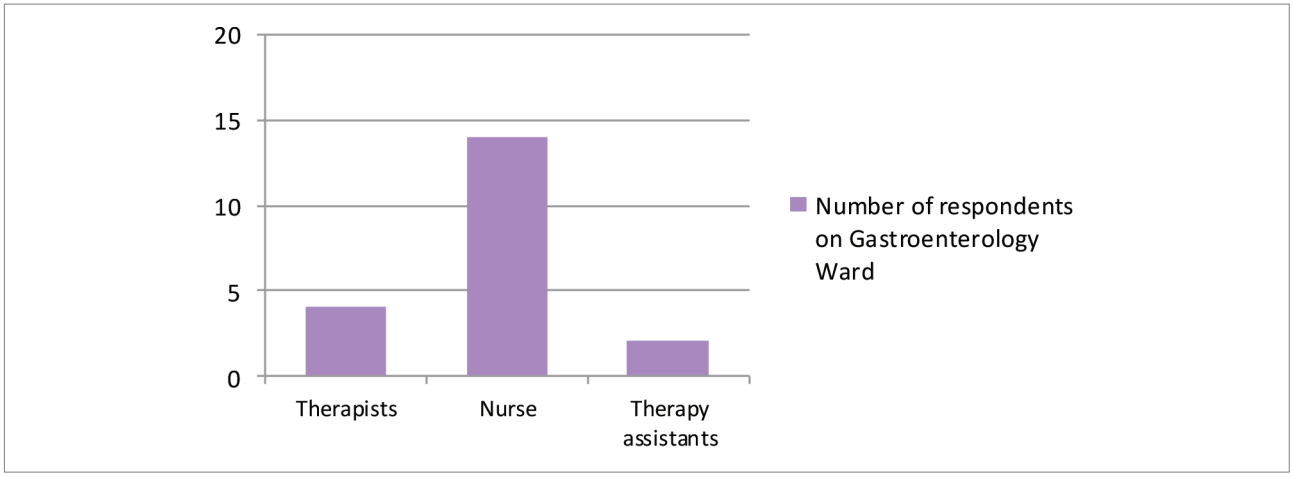
Initial survey included 16 nurses, 3 therapy assistants and 1 physiotherapist (Graph 1). Difficulties in conducting initial research were most often related to the absence of staff due to frequent annual leave and sickness during the period of research. The evaluation, i.e. the final survey, was conducted in the period from February to March 2018 on the Gastroenterology Ward at Royal Berkshire Hospital. It was conducted with the help of a 6-question questionnaire that was used to compare and detect changes on the ward through the implementation of innovations in communication, education and referral pathway. The final survey was conducted anonymously on a sample of 20 respondents: physiotherapists, occupational therapists, nurses and therapy assistants.

The evaluation questionnaire was placed at the reception desk, in the same place as the initial questionnaire for the sake of easier detection. Respondents involved 14 nurses, 4 therapists (physiotherapist and occupational therapist) and 2 therapy assistants (Graph 2) during the evaluation study.

The expressed parameters after the research collected from the initial and evaluation questionnaire were turned into percentages and graphically compared with parameters from the first and second group of respondents. The statistically significant difference in patient referral categories to the Rehabilitation Centre (IRIS) was calculated using Fisher's exact probability test. The test is otherwise demanding to compute so it is good for smaller samples (<100).



Graph 1. **Distribution and number of respondents in initial research (N=20)**



Graph 2. **Distribution and number of respondents in the evaluation study**

Results

The results obtained after the statistical analysis of the initial and the evaluation questionnaire were analysed by individual questions of the questionnaire. Questions that had shown a significant difference in the initial and evaluation research are separated and presented graphically.

Initial survey

Graph 3 demonstrated that 80% of the respondents had stated that they did not have necessary education on drug and rehabilitation centre in the community, while 20% of the respondents claim that they were provided relevant education.

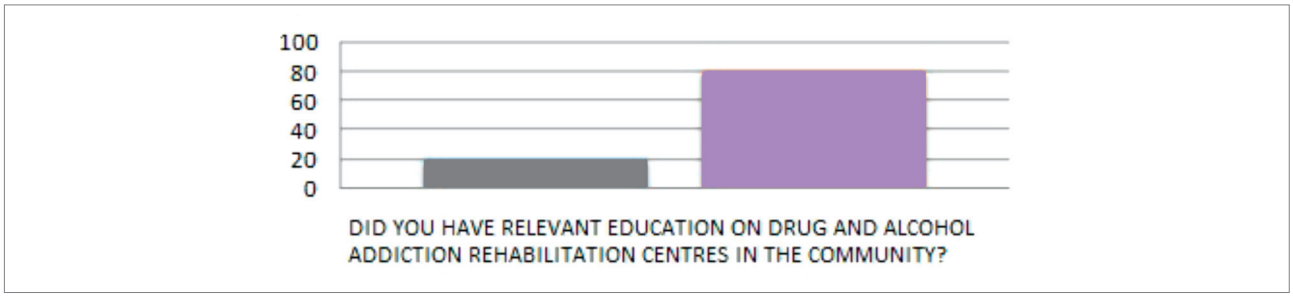
Graph 4 demonstrates that 55% of the respondents believe that the department has the necessary leaflets and information packages on drug and alcohol addiction rehabilitation centres, while 45% of the respondents believe that the department does not possess the necessary information packages.

Graph 5 demonstrates that 85% of the respondents believe that they do not have access to training on drug and alcohol addiction, while 15% believe that access to relevant education on drug and alcohol addiction is enabled.

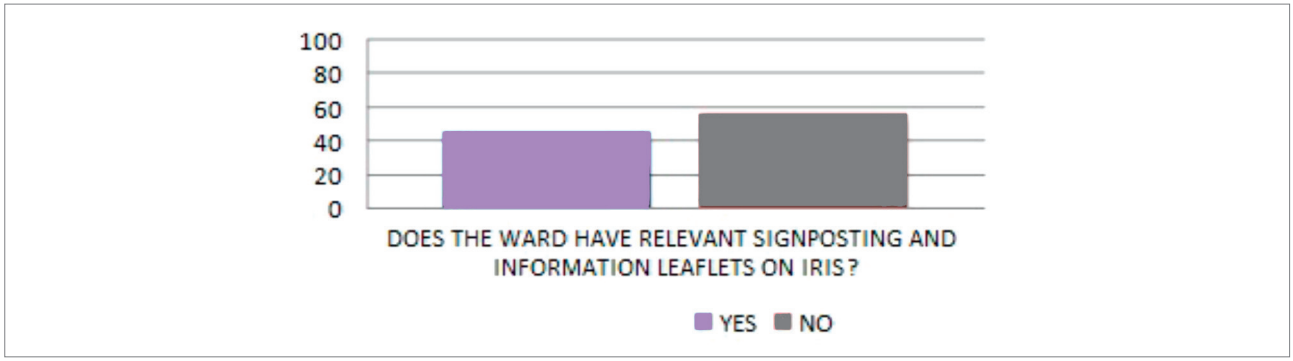
Graph 6 demonstrates that 70% of the respondents do not refer patients to the Drugs and Alcohol addiction Rehabilitation Centre. Only 30% of the respondents independently refer patients to the Drugs and Alcohol addiction Rehabilitation Centre.

Evaluation survey

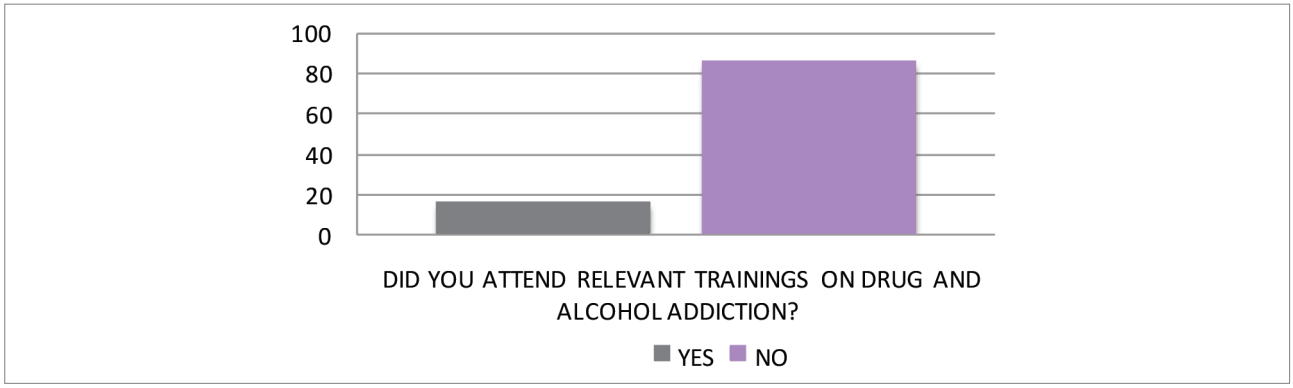
The aim of the final research is to evaluate the applied changes and to identify still present problems.



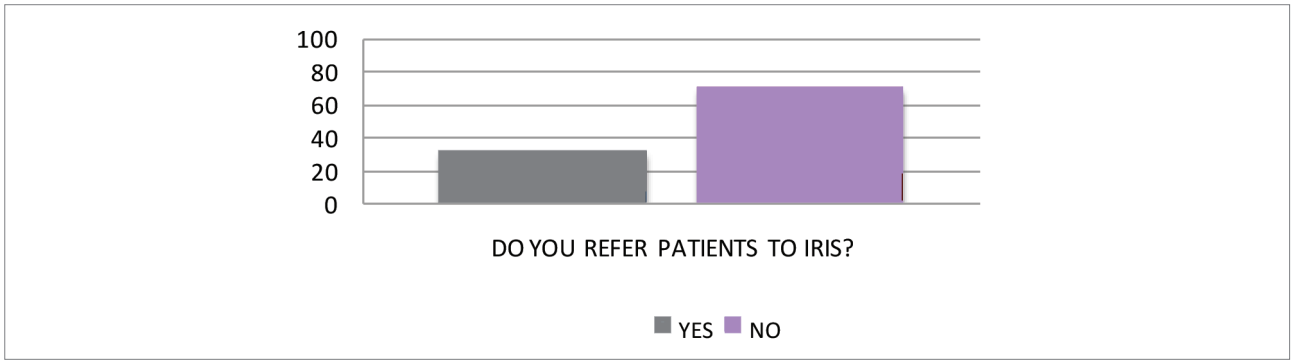
Graph 3. **Data relating to the question regarding relevant education in percentages (N=20)**



Graph 4. **Data relating to the question regarding relevant signposting on the ward in percentages (N=20)**



Graph 5. **Data relating to question regarding relevant trainings in percentages (N=20)**



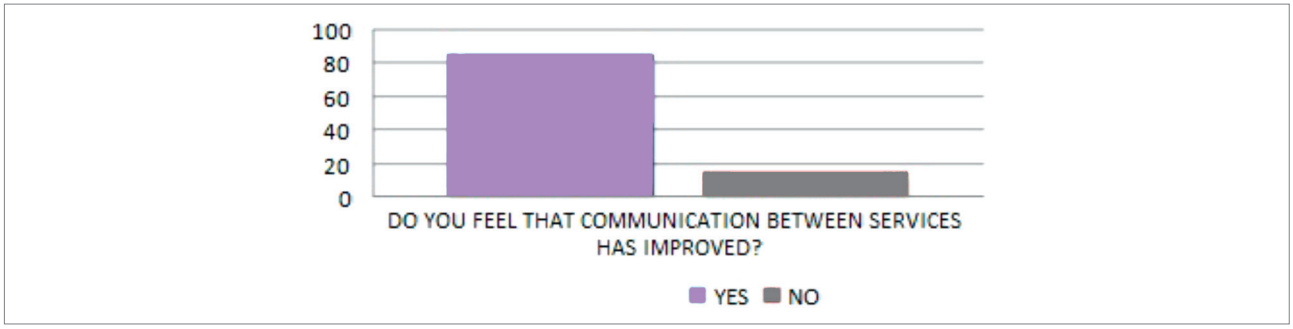
Graph 6. **Data relating to question regarding refering patients to IRIS in percentages (N=20)**

Graph 7 demonstrates that 85% of the respondents believe that communication between the ward and the Drug and Alcohol Addiction Rehabilitation Centre has improved after the implementation of innovation, while 15% believe that communication has not improved even after the introduction of change.

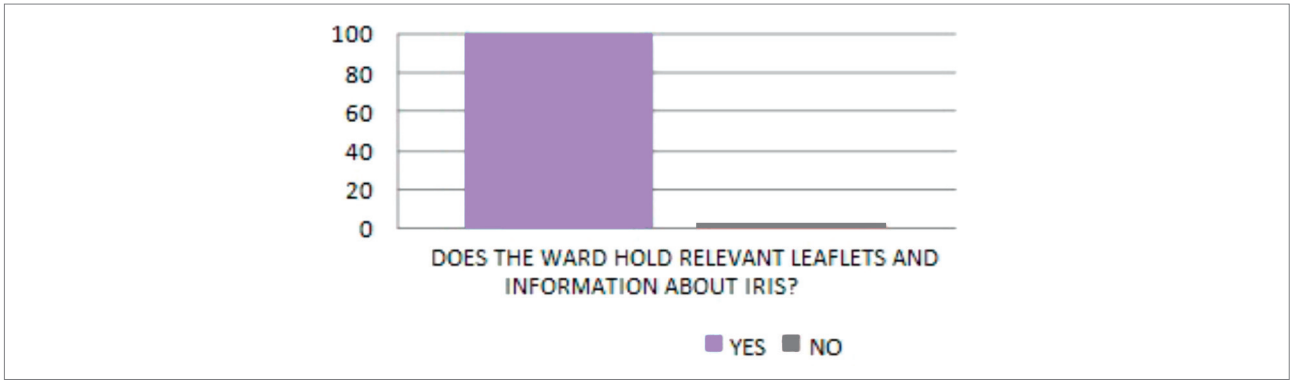
Graph 8 demonstrates that 99% of the respondents believe that the ward currently has information packages and leaflets. Only 1% of the respondents feel that this is not the case.

Graph 9 demonstrates that 65% of the respondents attended newly organised trainings arranged by Drug and Alcohol Addiction Rehabilitation Centre, while 35% of the respondents had not yet attended such type of education.

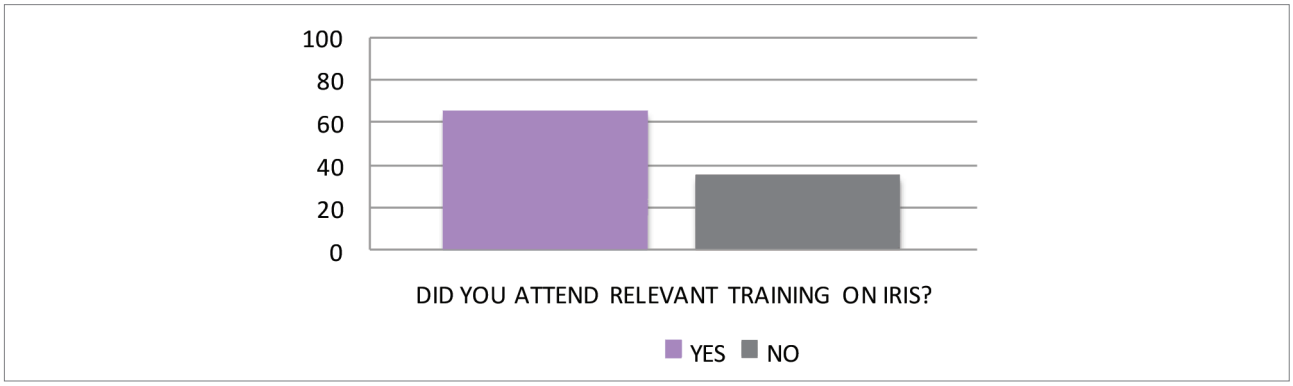
Graph 10 demonstrates that 60% of the respondents independently refer patients to the Drug and Alcohol Addiction Rehabilitation Centre, while 40% of the respondents still do not refer patients to the same service.



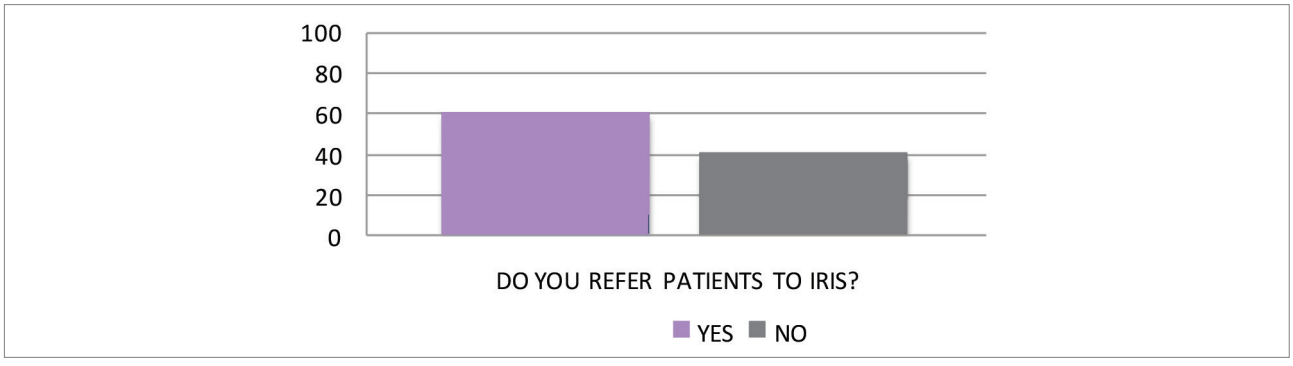
Graph 7. **Data relating to the question regarding improved communication between services (N=20)**



Graph 8. **Data relating to the question regarding relevant signposting on the Ward in percentages (N=20)**



Graph 9. **Data relating to the question regarding relevant training in percentages (N=20)(N=20)**



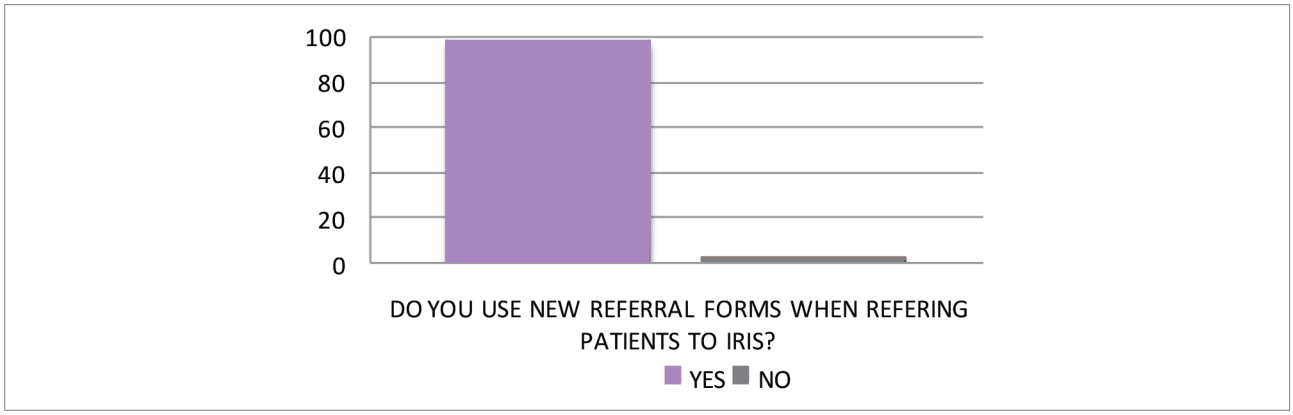
Graph 10. **Data relating to the question regarding referring patients to IRIS in percentages (N=20)**

Graph 11 demonstrates that 98% of the respondents use new referrals when referring patients, and only 2% of the respondents do not use new referrals

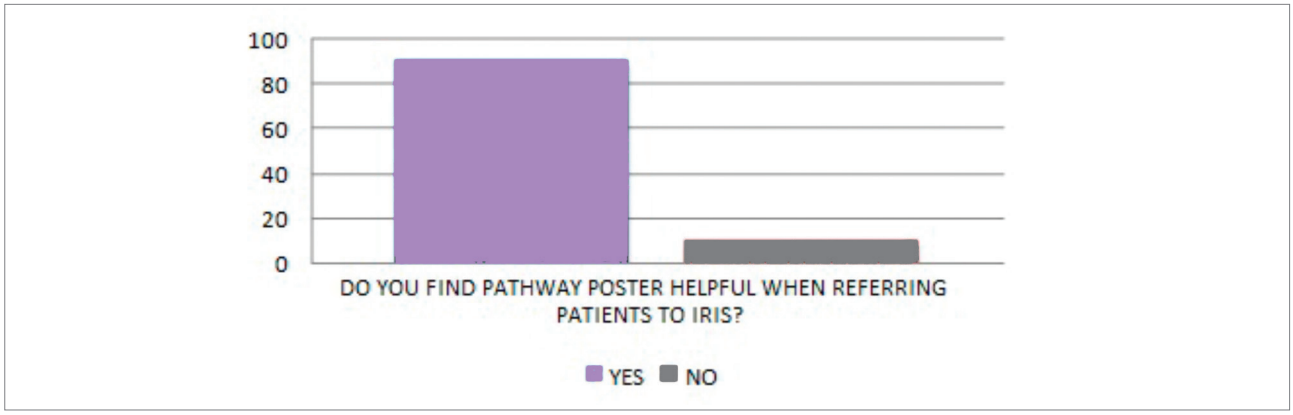
Graph 12 demonstrates that 90% of the respondents believe that a new poster with referring guidelines is beneficial, while 10% of the respondents feel that there is no benefit from the same poster.

Comparative tabular view of the achieved changes

Table 1 shows a comparison of the data obtained after the initial and evaluation questions processed with Fisher's exact probability test which calculated p=0,055. That indicates that there is no statistically significant result in the initial and evaluation answers to the above question.



Graph 11. **Data relating to the question regarding usage of new referrals in percentages (N=20)**



Graph 12. **Data relating to the question regarding pathway poster in percentages (N=20)**

Table 1. **Tabular representation of data relating to the question "Do you refer patients to community rehabilitation centre"**

Do you refer patients into Drug and Alcohol addiction rehabilitation centre - IRIS?	YES	NO	TOTAL
Initial survey	6	14	20
Evaluation survey	12	8	20
TOTAL	18	22	40

Discussion

After the initial investigation, it was clearly apparent that the ward staff lacked relevant education on drug and alcohol addiction rehabilitation centres, as 60% of the respondents were unable to name a drug and alcohol addiction rehabilitation centre available outside the hospital organisation. The questionnaire showed that 80% of the respondents were not educated about local rehabilitation centres at all. The same percentage of the respondents felt that they were not educated on drug and alcohol addiction, which leads to the question whether staff are able to conduct drug therapy and rehabilitation to patients with drug and alcohol addiction. Evidence from other research shows that "happy staff leads to happy patients" so that investment in staff and their education is of utmost importance (22). There is a possibility that the obtained result was also influenced by the level of official education among the respondents, because some of the respondent did not hold high qualification. More than half of the staff, up to 55%, points to a lack of communication between the ward and IRIS, the local Drug and Alcohol Addiction Rehabilitation Centre. After these findings, it was necessary to define and implement key changes with a view to a more successful collaboration between the department and the rehabilitation centre. This result was likely affected by frequent staff changes, frequent sick leave and annual leave during the research period. It was important to establish an innovative type of communication between the two teams, which implies the creation of new ways of informing and referring patients to rehabilitation centres after discharge from the hospital, and to provide continuous, high quality education to the department staff. The changes that have been made have focused on three major categories: communication between the ward and IRIS, education on addiction and the competence to refer patients to IRIS. Application of changes must had been approved by the staff. This type of work is described by Schwartz Centre Rounds researchers who tend to allow their members to analyse problems and provide clear suggestions (13). Such a way of collaborative working has proven to increase the morale among members of the team (23). Changes require the implementation of different models and approaches in healthcare leadership. Recent research shows that most effective managers use multiple management styles at the right time. After conducting the evaluation survey, it could easily be concluded that the results obtained were different from the initial results. Implementing departmental changes has been shown to have contributed to improved communication between team members and the Centre for Drugs and Alcohol Abuse (IRIS), which can be concluded from the fact that 85% of the respondents responded positively when asked about improvements in communication. Even 65% of the respondents attended newly organized workshops and trainings by IRIS, which is of importance due to the specialty of the department. The evaluation questionnaire noted that 60% of the respondents were referring patients from the ward into the Drug and Alcohol Addiction Rehabilitation Centre (IRIS) independently, thus contributing to the creation of a new referral and setting up a poster with referring guidelines. Probably clear and simple instructions have contributed to an increase in self-confidence among staff. Although the percentage calculation showed an increase in independent patient referring, the conclusion after data processing by Fisher's exact test ($p < 0.05$) indicates that there is no statistically significant result, probably because of a small sample of respondents ($p = 0.055$). It would be beneficial to investigate this statistical problem on a bigger sample of respondents. It is clear that if a change affects an individual, it will also act on a particular action. In this case, the implementation of the change has affected the improvement of collaboration between the two teams with the aim of providing high quality therapy and care, while the impact on individuals within the teams was of paramount importance.

Conclusion

It can be concluded that leaders in health care are trying to move away from competition by implementing guidelines for collaboration. The key word in this process is integration. Leadership in health care begins when organisations and individuals cannot solve problems individually within the organisation.

The importance of self-consciousness of personal qualities is the foundation of successful team leadership in health care. The preparation and planning of the project required collaboration with external and internal stakeholders and constant notification of all project participants on the progress of the project itself. Individual and group meetings were of great importance because they allow the retention of professional relationships and encourage further collaboration. After processing the initial and evaluation research data and after implementing changes it can be concluded that the project had an impact on patients, staff on the ward and team of therapists (physiotherapists and occupational therapists) as most of the answers in evaluation survey were positive, with answer *Yes* incised when asked about improved communication, relevant education and usage of new referrals and pathway poster. This project could also be extended to other departments in the hospital. Emergency and Surgical Departments are receiving patients who are addicted to drugs and alcohol every day, and early detection of such patients would have a major impact on the quality of hospital care and further rehabilitation. The project can also be combined with other currently active projects in the hospital or outside the hospital environment, although it would require staff restructuration and a new financial plan. The goals set at the beginning of the project have been achieved but the ultimate goal is to maintain the project and to develop strategies for further development within the hospital and further.

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UNAPRJEĐENJE SURADNJE ODJELA GASTROENTEROLOGIJE I CENTRA ZA REHABILITACIJU OD OVISNOSTI O DROGAMA I ALKOHOLU

Sažetak

Uvod. Potreba za razvijanjem projekta identificirana je tijekom rada s multidisciplinarnim timom na gastroenterološkom odjelu u bolnici Royal Berkshire u Engleskoj, gdje je bilo očito da se zdravstveni stručnjaci suočavaju s problemima pružanja kontinuirane rehabilitacije nakon otpuštanja pacijenata ovisnika o drogama i alkoholu iz bolnice.

Cilj. Postići da svi članovi tima: radni terapeuti, fizioterapeuti, medicinske sestre i terapeutski asistenti na gastroenterološkom odjelu bolnice budu sposobni uputiti pacijente u Centar za rehabilitaciju od ovisnosti o drogama i alkoholu u zajednici IRIS te tako poboljšati suradnju s IRIS-om.

Metode. Inicijalno istraživanje provedeno je na gastroenterološkom odjelu u bolnici Royal Berkshire u Engleskoj u razdoblju između listopada i prosinca 2017., dok je evaluacijsko istraživanje provedeno u razdoblju između veljače i ožujka 2017. na uzorku od 20 ispitanika. Podaci su prikupljeni s pomoću upitnika kreiranog u svrhu ispitivanja.

Rezultati. Nakon analize rezultata evaluacijskog istraživanja uočeno je da 85 % ispitanika smatra da se komunikacija među službama poboljšala, dok je čak 65 % ispitanika prisustvovalo radionicama i edukacijama koje je organizirao IRIS. Statistička značajnost ($p < 0,05$) nije uočena kod upućivanja pacijenata u IRIS ($p = 0,055$), vjerojatno zbog malog uzorka ispitanika.

Zaključak. Integracija timova ključna je kod primjene smjernica koje vode prema suradnji. Implementacija promjena temeljenih na poboljšanju komunikacije, organizaciji treninga i edukaciji te upućivanju pacijenata u rehabilitacijski centar u zajednici pridonijela je porastu kompetencija članova tima na odjelu.

Ključne riječi: rukovodstvo, fizioterapija, odjel gastroenterologije, centar za ovisnosti o drogama i alkoholu u zajednici

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