University of Applied Health Sciences
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CROATIAN NURSING JOURNAL

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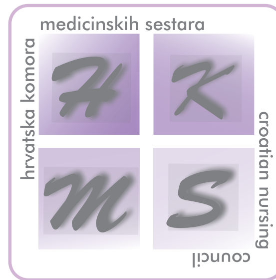

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Nursing Students' Knowledge and Attitudes Towards Telenursing

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Abstract

Introduction. Telenursing, a subset of telehealth, is the use of information technology and telecommunications to provide remote nursing care. Telemedicine is used for the purpose of diagnosis, treatment, symptom management and monitoring of the patient's condition. Telenursing also enables counseling and patient education.

Aim. To determine the knowledge and attitudes of nursing students towards telenursing.

Methods. The cross-sectional study was conducted involving nursing students from University of Applied Health Sciences Zagreb during June 2023. A link to web-based survey was sent to students, and 140 students completed it. The survey used in the research included demographic data, data related to telemedicine and telenursing education, and 16 statements related to telenursing.

Results. Most participants didn't listen to lectures on telenursing (66.4%) or telemedicine (50.7%) during their studies. More than 89% of participants believe that education on the application of telenursing would be useful for future nursing bachelors, and more than 83% of participants believe that the knowledge of healthcare workers and patients can influence the use of telemedicine and telenursing in patient care. The majority of participants (N=91; 65%) believe that a video conference call cannot replace a live visit to a patient, but they also believe that telenursing can ensure greater availability of care for patients (N=82; 58.6%). The majority of participants (N=72; 51.5%) believe that telenursing can be applied in the care of almost all groups of patients.

Conclusions. Students have mostly positive attitudes regarding the possibility of using telenursing, but they are undecided regarding the advantages of telenursing. A lack of knowledge and wrong beliefs related to the beginning of the application of telenursing, advantages and possibilities of using telenursing in health practice were observed. Including more content related to telenursing in student education can improve students' knowledge and attitudes.

Introduction

Nurses face numerous challenges in their daily practice, some of which include the aging of the population, the increase in the number of patients with chronic diseases, the lack of nurses, changes related to technological development, digitalization and ways of providing healthcare. Telehealth, telemedicine and telenursing have been used for decades in the provision of healthcare in order to ensure accessible, safe and quality care. With the advent of the COVID-19 pandemic, there has been a significant increase in the use of telemedicine and telenursing services, as well as a change in attitudes towards telemedicine and telenursing.

Telemedicine is defined as the delivery of healthcare services, where distance is a critical factor, by all healthcare professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuous education of healthcare providers, all in the interests of advancing the health of individuals and their communities (1). Telenursing, a subset of telehealth, is the use of information technology and telecommunications to provide remote nursing care. The American Nurses Association has defined telenursing as the use of "technology to deliver nursing care and conduct nursing practices" (2). Telemedicine is used for the purpose of diagnosis, treatment, symptom management and monitoring of the patient's condition (3, 4). Telenursing also enables counseling and patient education.

The first documented evidence of telenursing occurred in 1974, when Mary Quinn, RN, an employee of Boston Hospital's telemedicine center, provided remote nursing care to patients who were at Logan Airport (5). The beginnings of telemedicine in Croatia were connected with the transmission of ECG signals over telephone lines in the 1970s and 1980s. The application was limited due to the development of the telecommunications infrastructure, the procurement of equipment and the development of the Internet (6). With the development of technology, the availability of computers, tablets, smartphones and the development of the Internet, as well as the education of healthcare workers, the possibilities of using telemedicine and telenursing have changed significantly. According to the International Telecommunication Union Statistics, 66% of the world's population is using the Internet in 2022 (7).

Healthcare professionals provide several types of telehealth services: live video conferencing, asynchronous or store-and-forward technology, remote patient monitoring, and mHealth. When applying telenursing, a nurse can use various communication technologies, including telephone, fax, computer, tablet or other form of modern technology which enables capturing, storing, analyzing and dissemination data such as text, photos and videos using telecommunication (8, 9). Nurses can use applications such as WhatsApp, Facetime, SMS, e-mail, smartphone applications, etc. (3). The patient's condition can be monitored using applications installed on the patient's smartphone; the applications can also be used for the purpose of educating patients and family members.

Telenursing is being considered as an approach to meeting the needs for patient care. In telenursing, the nurse must follow the nursing process when assessing, planning, implementing, and evaluating care. The only difference is that the care is provided remotely, rather than in person.

Although telemedicine and telenursing have been applied for a number of years, especially for the purpose of providing care to patients living in rural areas and remote locations and for the purpose of monitoring the patient's condition, a significant increase in telemedicine and telenursing services occurred with the COVID-19 pandemic. The nurses who had not participated in telenursing interventions until then, as well as the patients who indicated that they were encountering telemedicine and telenursing interventions for the first time, were involved in the provision of services. In the United States, before the pandemic, 66% of patients indicated they would use

telemedicine services, and only 8% did. During the pandemic, there was a 638% increase in the use of telemedicine services in New York in 2020 (10), in a study by Cruoch and colleagues, 73% of participants stated that the COVID-19 pandemic made them more open to using telehealth (11).

Telemedicine services enable better access to health and nursing care, ensure continuity of care, save time and expenses, provide greater self-care possibilities, increase the participation of patients and, in the time of pandemic, reduced the risk of transition of infection (4, 12-17). Telenursing/telehealth with telemonitoring is effective in decreasing the number of outpatient and emergency room visits, shortening hospital stays, improving health-related quality of life, and decreasing the cost of healthcare (18).

The effectiveness of telenursing services was achieved when providing care for chronically ill patients (17), oncology patients (18, 19), patients undergoing surgery (12) in home care (3), palliative care (20) and in many other cases. When caring for the elderly or people suffering from multiple chronic diseases, the support provided through telenursing enables patients to receive service in their own home without organizing a travel to a healthcare facility, which can be demanding and expensive.

Telemedicine interventions cannot always be applied. They are not suitable when a physical examination is required, when a diagnosis has not been established, and when the patient wants to visit in-a-person (14, 16). Also, telemedicine is not recommended for initial consult because it is hard to build a relationship between a physician or nurse and the patient. Technological difficulties such as the unavailability of technology which enables video calls, poor Internet coverage, lack of knowledge and resistance to technology can be a barrier to providing telenursing interventions. When it comes to healthcare workers, the main obstacle to the provision of telenursing interventions is the lack of knowledge and skills (13).

To provide telemedicine and telenursing interventions, health professionals need specific knowledge related to the use of technology, the implementation of telenursing visits, and the protection of patient privacy. Telenursing education has a significant impact on their knowledge, attitudes and awareness of future work (21, 22).

During their studies, students listen to classes related to information technology in nursing and the organization of providing health and nursing care, but it is not known what knowledge and attitudes the students have adopted.

According to our knowledge and the available published papers, knowledge and attitudes of nursing students in the Republic of Croatia towards telenursing have not been examined so far, therefore, the aim of our research was to determine knowledge and attitudes of nursing students towards telenursing.

Methods

Study design and participants

A cross-sectional study was conducted involving full-time nursing students from University of Applied Health Sciences Zagreb during June 2023. A link to web-based survey (Google Forms) was sent to students by e-mail with a request to fill out the survey. The survey was addressed to 321 students of the first, second and third year of nursing studies, and 140 students (43.61%) completed it.

Participation in the survey was voluntary, and filling out the survey implied consent to participate in the survey. The students were sent a reminder to complete the survey, and the students who didn't want to, didn't have to complete the survey. It took 5 minutes to complete the survey.

Instrument

For the purposes of the research, a survey was created. It included demographic data (age, gender, year of study), data related to telemedicine and telenursing education, and 16 statements related to telenursing. The statements were prepared on the basis of the literature related to telenursing and a survey which was previously used to assess the attitudes of nursing students and nurses towards telenursing (22).

When it comes to statements about telenursing, the participants indicated on a Likert-type scale from 1 to 5 the extent to which they agree with a particular statement, where 1 indicates "strongly disagree" and 5 "strongly agree".

Ethics

The ethics committee of the educational institution approved the implementation of the research (Adm No:602-03/23-18/390; Ref. No:251-379-10-23-02). The students were informed of the purpose of the research, filling out the survey implied the consent to participate in the research. The principles of the Declaration of Helsinki were applied in conducting the research.

Statistics

The data were entered in an Excel spreadsheet and analyzed in SPSS 20.0 software (IBM Corp., NY, USA) for statistical analysis. The normality of the distribution of all variables was tested using the Kolmogorov-Smirnov test for normality. It was found that all variables significantly deviate from normal distribution. Descriptive statistics, Mann-Whitney U test and Kruskal-Wallis test were used to analyze the data, and $p<0.05$ was considered significant.

Results

A total of 140 full-time nursing students participated in the research. Most of the participants were second year students 40.7% (N=57) and most of them were women 90% (N=126). The age ranged from 29 to 46 years, and the average age was M= 22.4 (SD=3.97).

Table 1. **Demographic characteristics**

		N	%
Study year	1st year	50	35.7
	2nd year	57	40.7
	3rd year	33	23.6
	Total	140	100
Gender	Female	126	90
	Male	14	10
	Total	140	100
Age	19-25	132	94.3
	26-40	6	4.3
	41-46	2	1.4
	Total	140	100

Most participants stated that they did not listen to lectures on telenursing (66.4%) or telemedicine (50.7%) during their studies.

Table 2. **Students' response related to lectures on telenursing and telemedicine**

		N	%
Did you listen to telenursing lectures during your studies?	Yes	47	33.6
	No	93	66.4
	Total	140	100
Did you listen to telemedicine lectures during your studies?	Yes	69	49.3
	No	71	50.7
	Total	140	100

More than 89% of participants (N=111) believe that education on the application of telenursing would be useful for future nursing bachelors, and more than 83% of participants believe that the knowledge of healthcare workers and patients can influence the use of telemedicine and telenursing in patient care. Furthermore, more than three quarters of participants (N=107, 76.4%) believe that family members can help when using telemedicine services.

Only 7.8% of participants (N=11) do not agree that the beginning of telenursing is related to the pandemic of the disease COVID-19, while the majority of participants agree with that statement (N=69, 49.3%), and a large part of participants are undecided (N=60, 42.9%).

The majority of participants (N=91, 65%) believe that a video conference call cannot replace a live visit to a patient, but they also believe that telenursing can ensure greater availability of care for patients (N=82, 58.6%). The majority of participants are undecided regarding the claims that telenursing could reduce the connection between nurses and patients (N=63, 45%), increase the costs of care (N=75, 51.4%), increase the efficiency of clinical staff (N=71, 50.7%) and facilitate direct contact of clinical staff with patients (N=60, 42.9%).

The majority of participants (N=72; 51.5%) believe that telenursing can be applied in the care of almost all groups of patients, as well as in nursing care in the community (N=88, 62.9%), in patients with diabetes (N=97, 69.3%), during long-term care for patients (N=79, 56.4%), but only 44.2% of participants

Table 3. **Descriptive statistics of students' responses related to lectures on telenursing and telemedicine**

		N	%	$\bar{x}$	Md	Mo	Sd
Education on the application of telenursing in patient care would be useful for nurses.	Strongly disagree	7	5	4.20	5	5	1.08
	Disagree	3	2.1				
	Neither agree nor disagree	19	13.6				
	Agree	37	26.4				
	Strongly agree	74	52.9				
	Total	140	100				
Telenursing can be applied in the care of almost all groups of patients.	Strongly disagree	7	5	3.57	4	3	1.07
	Disagree	10	7.1				
	Neither agree nor disagree	51	36.4				
	Agree	40	28.6				
	Strongly agree	32	22.9				
	Total	140	100				
The knowledge of healthcare workers and patients can influence the application of telemedicine and telenursing in patient care.	Strongly disagree	5	3.6	4.25	4	5	0.93
	Disagree	0	0				
	Neither agree nor disagree	18	12.9				
	Agree	49	35				
	Strongly agree	68	48.6				
	Total	140	100				
Family members can help when using telemedicine services.	Strongly disagree	5	3.6	4.11	4	5	0.98
	Disagree	1	0.7				
	Neither agree nor disagree	27	19.3				
	Agree	48	34.3				
	Strongly agree	59	42.1				
	Total	140	100				
Telenursing could decrease the connection between nurses and patients.	Strongly disagree	10	7.1	3.20	3	3	1.08
	Disagree	20	14.3				
	Neither agree nor disagree	63	45				
	Agree	26	18.6				
	Strongly agree	21	15				
	Total	140	100				
Telenursing can increase the cost of patient care.	Strongly disagree	12	8.6	2.86	3	3	0.97
	Disagree	31	22.2				
	Neither agree nor disagree	72	51.4				
	Agree	15	10.7				
	Strongly agree	10	7.1				
	Total	140	100				
The beginning of the application of telenursing is related to the pandemic of the COVID-19 disease.	Strongly disagree	3	2.1	3.58	3	3	0.93
	Disagree	8	5.7				
	Neither agree nor disagree	60	42.9				
	Agree	43	30.7				
	Strongly agree	26	18.6				
	Total	140	100				

Table 3. **Descriptive statistics of students' responses related to lectures on telenursing and telemedicine**

		N	%	$\bar{x}$	Md	Mo	Sd
A video conference call can replace a "live" visit to the patient.	Strongly disagree	59	42.1	2.11	2	1	1.18
	Disagree	32	22.9				
	Neither agree nor disagree	31	22.1				
	Agree	11	7.9				
	Strongly agree	7	5				
	Total	140	100				
Telenursing can increase efficiency of clinical staff.	Strongly disagree	6	4.3	3.33	3	3	1.13
	Disagree	10	7.1				
	Neither agree nor disagree	71	50.8				
	Agree	38	27.1				
	Strongly agree	15	10.7				
	Total	140	100				
Telenursing can ensure greater availability of patient care.	Strongly disagree	6	4.3	3.74	4	3	0.99
	Disagree	2	1.4				
	Neither agree nor disagree	50	35.7				
	Agree	46	32.9				
	Strongly agree	36	25.7				
	Total	140	100				
Telenursing can facilitate direct contact between clinical staff and patients.	Strongly disagree	7	5	3.34	3	3	1.03
	Disagree	16	11.4				
	Neither agree nor disagree	60	42.9				
	Agree	36	25.7				
	Strongly agree	21	15				
	Total	140	100				
Telenursing can be used in community nursing.	Strongly disagree	3	2.1	3.81	4	4	1.01
	Disagree	10	7.1				
	Neither agree nor disagree	39	27.9				
	Agree	47	33.6				
	Strongly agree	41	29.3				
	Total	140	100				
Telenursing can be used in nursing care for diabetic patients.	Strongly disagree	4	2.9	3.99	4	5	0.99
	Disagree	3	2.1				
	Neither agree nor disagree	36	25.7				
	Agree	44	31.4				
	Strongly agree	53	37.9				
	Total	140	100				
Telenursing can be used in oncology nursing.	Strongly disagree	9	6.4	3.41	3	3	1.15
	Disagree	18	12.9				
	Neither agree nor disagree	51	36.5				
	Agree	31	22.1				
	Strongly agree	31	22.1				
	Total	140	100				

Table 3. **Descriptive statistics of students' responses related to lectures on telenursing and telemedicine**

		N	%	x̄	Md	Mo	Sd
Telenursing can be used in long-term nursing care.	Strongly disagree	8	5.7	3.66	4	3	1.14
	Disagree	11	7.9				
	Neither agree nor disagree	42	30				
	Agree	38	27.1				
	Strongly agree	41	29.3				
	Total	140	100				
Mobile applications (mHealth) are used in the monitoring of chronically ill patients.	Strongly disagree	4	2.9	3.43	3	3	0.89
	Disagree	4	2.9				
	Neither agree nor disagree	82	58.5				
	Agree	28	20				
	Strongly agree	22	15.7				
	Total	140	100				

Legend: x̄- mean; Md – median, Mo – mod; Sd – standard deviation

(N=61) agree with the statement that telenursing can be used in the care of oncology patients. The majority of participants (58.6%, N=82) are undecided regarding the statement that mobile applications are used in the monitoring of chronically ill patients, while only a third of participants agree with this statement (N=50, 35.7%).

The highest level of agreement among participants was documented on the statements "The knowledge of healthcare workers and patients can influence the application of telemedicine and telenursing in patient care" (M=4.25; SD=0.93) and "Education on the application of telenursing in patient care would be useful for nurses" (M=4.20; SD=1.08), while the lowest degree of agreement was documented on the statement "A video conference call can replace a 'live' visit to the patient" (M=2 .11; SD=1.18) and "Telenursing can increase the cost of patient care" (M=2.86; SD=0.97).

The students who listen about telemedicine in lectures have a statistically significantly higher level of agreement with the statements "The knowledge of healthcare workers and patients can influence the application of telemedicine and telenursing in patient care" (M-W=1928.0; $p<0.05$), "Family members can help when using telemedicine services" (M-W=1928.0; $p<0.05$), "Telenursing can decrease the connection between nurses and patients" (M-W=1834.5; $p<0.05$), "The beginning of the application of telenursing is related to the pandemic of the COVID-19 disease" (M-W=1974.0; $p<0.05$), and "Telenursing can ensure greater availability of patient care" (M-W=1886.5; $p<0.05$) (Table 4).

Students who listened about telenursing in lectures have a statistically significantly higher level of agreement with the statements "Family members can help when using telemedicine services" (M-W=1722.5; $p<0.05$), "A video conference call can replace a live visit to the patient" (M-W=1755.5; $p<0.05$), "Telenursing can be used in oncology nursing" (M-W=1721.0; $p<0.05$), and "Telenursing can ensure greater availability of patient care" (M-W=1584.5; $p<0.05$) (Table 5).

Considering the year of study, there is a statistically significant difference in the level of agreement with the statement "Telenursing can be applied in the care of almost all groups of patients" (K-W=9.095; $p<0.05$), with the highest level of agreement expressed by students of the second year of nursing studies. To determine the statistically significant difference in the mentioned variable between years of nursing studies, we conducted three Mann-Whitney U tests. The results indicated a statistically significant difference between the 1st and 2nd study years (M-W=1825,0; $p<0.05$), as well as between the 1st and 3rd years (M-W=660.5; $p<0.05$). We also found statistically significant difference in the statement "The beginning of the application of telenursing is

Table 4. **The results of Mann-Whitney U test of differences on items, where statistically significant difference was observed considering whether students listen about telemedicine in lectures**

Variable	Did you listen to telemedicine lectures during your studies?	N	Mean Ranks	Mann-Whitney U	*p*
The knowledge of healthcare workers and patients can influence the application of telemedicine and telenursing in patient care.	Yes	69	79.06	1928.0	0.018
	No	71	63.15		
Family members can help when using telemedicine services.	Yes	69	78.17	1920.5	0.019
	No	71	63.05		
Telenursing can decrease the connection between nurses and patients.	Yes	69	79.41	1834.5	0.007
	No	71	61.84		
The beginning of the application of telenursing is related to the pandemic of the COVID-19 disease.	Yes	69	77.39	1974.0	0.035
	No	71	63.80		
Telenursing can ensure greater availability of patient care.	Yes	69	78.66	1886.5	0.013
	No	71	62.57		

p<0.05

Table 5. **The results of Mann-Whitney U test of differences on items where statistically significant difference was observed considering whether the student listen about telenursing in lectures**

Variable	Did you listen to telenursing lectures during your studies?	N	Mean Ranks	Mann-Whitney U	*p*
Family members can help when using telemedicine services.	Yes	47	80.35	1722.5	0.029
	No	93	65.52		
A video conference call can replace a "live" visit to the patient.	Yes	47	79.65	1755.5	0.046
	No	93	65.88		
Telenursing can ensure greater availability of patient care.	Yes	47	83.29	1584.5	0.005
	No	93	64.04		
	No	93	67.17		
Telenursing can be used in oncology nursing.	Yes	47	80.38	1721.0	0.033
	No	93	65.51		

p<0.05

Table 6. **The results of Kruskal-Wallis test of differences on items where statistically significant difference was observed regarding the year of study**

Variable	Study year	N	Mean Ranks	Kruskal-Wallis test	*p*
Telenursing can be applied in the care of almost all groups of patients.	1.	50	62.71	9.095	0.011
	2.	57	82.43		
	3.	33	61.70		
The beginning of the application of telenursing is related to the pandemic of the disease COVID-19.	1.	50	80.01	6.510	0.039
	2.	57	61.25		
	3.	33	72.08		

p<0.05

related to the pandemic of the COVID-19 disease" (K-W=6.510; $p<0.05$), where the highest level of agreement was expressed by students of the first year of nursing studies (Table 6). To determine between which years of study there is the statistically significant difference, we also conducted three Mann-Whitney U tests. The results indicated a statistically significant difference between the 1st and 2nd study years (M-W=1045,0; $p<0.05$)

Discussion

The aim of the research was to determine knowledge and attitudes of nursing students towards telenursing. Students have mostly positive attitudes regarding the possibility of using telenursing, but they are undecided regarding the advantages of telenursing. A lack of knowledge and wrong beliefs related to the beginning of the application of telenursing, advantages and possibilities of using telenursing in healthcare were observed.

Telenursing has been used in the provision of nursing care for more than 40 years, and the increase in use was stimulated by the pandemic of the COVID-19 disease. The majority of students state that they have not listened to lectures on telemedicine and telenursing. Furthermore, the majority believe that education on the application of telenursing would be useful and that the knowledge of healthcare workers affects the application of telenursing and telemedicine in patient care. In the research by Poredda et al. (21) and Glinkowski et al. (22), the participants stated that they believe that education of nursing students about telenursing during undergraduate studies is necessary.

The education of healthcare workers should be planned in order to possess the necessary knowledge and skills to provide safe, effective, and personalized care. The required competencies regarding telenursing can be classified into eight major categories: clinical knowledge, critical thinking skills, technological skills, clinical skills, communication skills, implementation skills, professionalism and professional ethics, and evidence-based practice (23).

The majority of participants state that the use of telenursing is related to the emergence of the COVID-19 pandemic. During their studies, students listen to lectures on telemedicine and the use of certain monitoring systems and applications, but considering the students' answers, it is necessary to expand the content and introduce students to telemedicine, telenursing and applications used for remote monitoring of patients' conditions.

The majority of participants are undecided regarding the statements that telenursing could increase the efficiency of clinical staff and facilitate direct contact of clinical staff with patients, whereby our results differ from the results of the research of Glikowski et al. (22). In the research of Glikowski and colleagues, 90% of participants presented opinion that telenursing could increase the efficiency of clinical staff (22). Also, the majority of participants believe that a video conference call cannot replace a live visit to a patient, which is not true, because video conference calls are used for the purpose of permanent monitoring of the patient's condition, control checkups, and in that way they can replace the visit of a healthcare worker to the patient, i.e. the patient does not need to go to a health institution for checkup (14, 16).

The majority of participants believe that telenursing can be applied in the care of almost all groups of participants, and in nursing care in the community, for those suffering from diabetes, during long-term care for patients. The majority of participants in previously conducted research also believe that telenursing can be applied to all groups of patients (15, 21).

Less than one half of the participants agree with the statement that telenursing can be applied in the care of oncology patients, but students who stated that they listened about telenursing in lectures have a statistically significantly higher level of agreement with the statement that telenursing can be applied to oncology patients, which is today a common practice (18, 19).

Despite the fact that a number of mobile applications are used to monitor patients suffering from chronic diseases, especially those suffering from diabetes, the majority of participants are undecided about the statement that mobile applications are used to monitor chronically ill patients, while only a third of participants agree with this statement.

The students from all three years of nursing studies participated in our research, and the research was

conducted at the end of the academic year, so that students of the first year of study also attended lectures on information technology in nursing and they also listened lectures on nursing care and attended clinical practice. Considering the year of study, a statistically significant difference was observed in the level of agreement with the statement "Telenursing can be applied in the care of almost all groups of patients", where the highest level of agreement was expressed by students of the second year of nursing studies, and with the statement "The beginning of the application of telenursing is related to the pandemic of the COVID-19 disease", where the highest level of agreement was expressed by students of the first year of nursing studies, but unfortunately this is not correct. The COVID-19 pandemic has significantly increased the use of information and communication technology in all activities of human functioning, especially in education and medicine. Due to the significant increase in use, students may have the impression that due to specific circumstances, the application of telemedicine and telenursing began then.

The students who heard about telenursing in lectures have a statistically significantly higher level of agreement with the statements "Family members can help when using telemedicine services", "A video conference call can replace a 'live' visit to the patient", "Telenursing can be used in oncology nursing" and "Telenursing can ensure greater availability of patient care", which indicates more positive attitudes towards telenursing. We can assume that more positive attitudes are related to previous education and that with targeted education, students would acquire the necessary knowledge and skills, and have more positive attitudes towards telenursing.

The application of telenursing among working nurses is influenced by numerous factors such as previous experiences, the use of similar technology and social networks, digital education, and computer self-efficacy (8, 13). The students are aware of the need to acquire knowledge about telenursing, and 79.3% of them state that the education would be useful for nurses. The content related to telenursing should be included to a greater extent in the education of nursing students, both in the course related to information technology in nursing care and in other courses in the field of nursing care and healthcare organization. When presenting the content, it is necessary to additionally emphasize the possibilities of applied technology and connect the application of technology with telemedicine. Also, in practical classes, the student should be introduced to and involved in the application of telenursing interventions.

Limitations

A cross-sectional study was conducted to determine the results of the participants at the time of the research. The research was conducted at one university, and therefore it is not possible to generalize the results of the research to all nursing students, but the obtained results can be used for comparation with the results of future research. Although a convenience sample was used, the value of the research is the participation of students of all 3 study years in the research.

Conclusion

The students have mostly positive attitudes regarding the possibility of using telenursing, but they are undecided regarding the advantages of telenursing. A lack of knowledge and wrong beliefs related to the beginning of the application of telenursing, advantages and possibilities of using telenursing in health practice were observed.

It is necessary to incorporate content related to telemedicine and telenursing into the study program so that students are prepared to provide telemedicine/telenursing services. Education and insight into application possibilities can contribute to more positive attitudes towards telenursing.

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ZNANJA I STAVOVI STUDENATA SESTRINSTVA O TELESESTRINSTVU

Sažetak

Uvod. Telesestrinstvo, podskup telemedicine, jest korištenje informacijskom tehnologijom i telekomunikacijama za pružanje sestrinske skrbi na daljinu. Telemedicina se primjenjuje u svrhu dijagnostike, liječenja, upravljanja simptomima i praćenja stanja pacijenta, telesestrinstvo također omogućuje savjetovanje i edukaciju pacijenata.

Cilj. Utvrditi znanje i stavove studenata sestrinstva o telesestrinstvu.

Metode. Presječno istraživanje provedeno je na studentima sestrinstva Zdravstvenog veleučilišta u Zagrebu tijekom lipnja 2023. Studentima je poslana poveznica na web-upitnik te ga je ispunilo 140 studenata. Upitnik koji je upotrijebljen u istraživanju uključivao je demografske podatke, podatke povezane s predavanjima o telemedicini i telesestrinstvu te 16 tvrdnji povezanih s telesestrinstvom.

Rezultati. Većina sudionika tijekom studija nije slušala predavanja o telesestrinstvu (66,4 %) ili telemedicini (50,7 %). Više od 89 % sudionika smatra da bi edukacija o primjeni telesestrinstva bila korisna budućim prvostupnicima sestrinstva, a više od 83 % sudionika smatra da znanje zdravstvenih djelatnika i pacijenata može utjecati na primjenu telemedicine i telesestrinstva u skrbi za pacijente. Većina sudionika (N=91; 65 %) smatra da videokonferencijski poziv ne može zamijeniti posjet pacijentu uživo, ali također vjeruju da telesestrinstvo može osigurati veću dostupnost skrbi za pacijente (N=82; 58,6 %). Većina sudionika (N=72; 51,5 %) smatra da se telesestrinstvo može primijeniti u skrbi za gotovo sve skupine pacijenata.

Zaključci. Studenti imaju uglavnom pozitivne stavove o mogućnosti primjene telesestrinstva, ali su neodlučni kad je riječ o prednostima telesestrinstva. Uočen je nedostatak znanja i pogrešna uvjerenja povezana s početkom primjene telesestrinstva te prednostima i mogućnostima primjene telesestrinstva u zdravstvenoj praksi. Uključivanje više sadržaja povezanih s telesestrinstvom u edukaciju studenata može unaprijediti znanja i stavove studenata.

Ključne riječi: telesestrinstvo, stavovi, studenti

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Quality of Life of Patients after Musculoskeletal Surgery and Rehabilitation

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Keywords: quality of life, musculoskeletal system, rehabilitation, SF-36

Abstract

Introduction. Rehabilitation implies a form of healthcare aimed at restoring and maintaining physical strength and mobility with the ultimate goal of achieving the best possible results.

Aim. To examine the quality of life of patients after musculoskeletal surgery and rehabilitation in terms of age, sex, diagnosis, and comorbidities.

Methods. The research was conducted as a cross-sectional study. It included patients who underwent musculoskeletal surgery and rehabilitation at the inpatient treatment facility in the Bizovačke Toplice Spa for 21 days. An anonymous survey questionnaire was used with demographic data and the SF-36 self-assessment questionnaire on the quality of life.

Results. A total of 96 participants took part in the study, 62 (64.6%) were female, 44 (45.8%) had hip surgery and 43 (44.8%) had no comorbidities. The mean age of the participants is 63 years (range from 18 to 91 years). The participants aged 50 and younger have a significantly lower assessment of their limitations due to physical difficulties. Male participants estimated a statistically significantly better quality of life after surgery and rehabilitation compared to female participants, in terms of better physical functioning, assessments of greater vitality and energy, better psychological health, better social functioning, and a better perception of general health. The different diagnoses of the participants and the performed surgical procedures are not significantly related to the quality of life after musculoskeletal surgery and rehabilitation.

Conclusion. The lowest assessment of the quality of life of the participants was expressed in the aspect of limitations due to physical difficulties. Female participants, younger participants, and participants without comorbidities estimated a worse quality of life.

Introduction

Medical rehabilitation plays an important role in today's healthcare system, but also in society as a whole. Rehabilitation implies a form of healthcare aimed at restoring and maintaining physical strength and mobility with the ultimate goal of achieving the best possible results. The importance of rehabilitation is in achieving the greatest possible independence and quality of life for the individual after operations, injuries, and illnesses. After the surgery, patients, following the recovery period and the surgeon's approval, begin a 21-day rehabilitation program as part of the protocol determined according to the Ordinance on conditions and methods of exercising rights in the compulsory health insurance for hospital treatment with medical rehabilitation and physical therapy at home. The insured person will be eligible to hospital inpatient rehabilitation if they meet the legal conditions and if it is considered that the implementation of the rehabilitation program will improve the person's functional status. Also, an individual has the right to undergo the rehabilitation if there are no contraindications such as infectious diseases, febrile conditions, decubitus wounds, malignant disease in a state of progression, heart decompensation, post-operative wounds which have not healed, and other conditions which make it impossible to carry out physical therapy (1). In the context of healthcare, rehabilitation is defined as a process of active changes by which a disabled person acquires the skills and knowledge necessary for normal social, psychological, and physical functioning (2). Early rehabilitation of the postoperative patient is the key to successful rehabilitation. Successful rehabilitation implies a motivated patient, continuous and adequate therapeutic exercises, prevention and suppression of possible complications, and treatment with a rehabilitation team (3). The aim of medical rehabilitation is for the patient to acquire the skills to live with new conditions and to teach them how to continue living with the current disability in their environment. During rehabilitation, the entire rehabilitation team, the patient, including the patient's family, should set a realistic goal together for the outcome of the rehabilitation to preserve the current and improve the future quality of life. Each person is unique, therefore the rehabilitation plan should be adapted to and individualized according to the individual (4). Also, for a person with a long-term disability, regardless of the disease, stage of the disease or age, rehabilitation can affect the improvement of the current condition. General interventions consist of rehearsing tasks and exercises, conducting education, and psychosocial support for patients. In addition, some unpredictable interventions can be involved, which makes rehabilitation a complex process and represents a challenge for the entire multidisciplinary team (5).

Musculoskeletal system

The musculoskeletal system, or the locomotor system, consists of bones in the body, muscles, ligaments, tendons, cartilage, joints, and other connective tissue. The skeleton serves as a support for the body and gives it shape, while the muscles are responsible for moving a certain part of the body and together ensure movement and stability (6). The damage which affects the musculoskeletal system includes many conditions/diseases which affect daily life and lead to temporary or permanent limitations in a person's mobility and functioning. Altered states in bone, muscle, joint, and connective tissue damage are often characterized by long-term and frequent pain that affects mobility and reduces people's ability to participate in social activities and daily work. Damage to the musculoskeletal system occurs throughout life, from early childhood to old age. Changes can be short-term and occur suddenly (fracture, sprain, strain) or long-term, chronic conditions such as osteoarthritis or primary back pain. Disorders of the musculoskeletal system bring the necessary need for rehabilitation. People exposed to damage/diseases of the musculoskeletal system are often exposed to the risk of developing problems related to mental health or other comorbidities (7).

Quality of life

Quality of life plays an important role in the field of medicine and healthcare. It is considered a complex concept which is interpreted differently within and between disciplines, including the fields of medicine and health (8). In the literature, we come across numerous definitions of the quality of health, but there is still no universally accepted definition, which is why there are numerous instruments and questionnaires which are used to assess the quality of life. The World Health Organization (WHO) defines the quality of life as an individual's perception of life in a social, specific cultural, and environmental context (9). The quality of life which we associate with health refers specifically to the health of the individual and indicates a measure of well-being, functioning, and general perception of health, and is divided into three phases: mental, social, and physical. The instruments used to measure health-related quality of life are based on the concept of health, and the patient is the source of information. In today's modern medicine, there is a growing interest in examining the cost-effectiveness and efficiency of new treatment methods which, apart from the benefit-cost ratio, include the patient's perception of health as a measure of successful treatment (10).

The role of the nurses in patient rehabilitation

Nowadays, patients have the right to and the need for adequate medical rehabilitation, for which the indispensable cooperation of health and non-health workers, health associates, and adequate medical space, accessories, and equipment are responsible. The team of rehabilitation health workers consists of specialists in physical and rehabilitation medicine - physiatrists, nurses, caregivers, physiotherapists, orthopedic technicians, occupational therapists, and others (11). The nurse in the rehabilitation team specializes in helping patients with certain disabilities and comorbidities with the aim to achieve health, functioning, and adaptation to a changed lifestyle. Nurses and technicians are part of a multidisciplinary team and often coordinate team activities and patient care, provide healthcare which promotes maintenance and restoration of function and prevention of complications, and provide education and counseling for both patients and families (12). When patients become unable to independently perform their daily activities and take care of their basic needs, the role of the nurse plays an important role in their lives (13).

Today, with the progress of nursing and the emphasis on active and independent care, the patient is actively involved in rehabilitation, and nursing interventions are no longer focused only on providing care, but also training, education, and support for the patient aimed at achieving the ultimate goal. This approach to nursing care is the main role of rehabilitation. The role of the nurse in rehabilitation includes maintaining basic physical functions such as breathing, and skin function, preventing complications from prolonged lying down, cardiovascular functions, taking care of adequate nutrition, and training self-care functions (14). Nurses do not only meet physical needs but also support patients in other aspects, such as social, psychological, and spiritual dimensions.

To fulfill the abovementioned needs, the equipment for healthcare and the environment in which the patient is located is also important (13). In the first place, the nurse is responsible for the patient's care and, depending on the patient's individual needs carries out adequate medical rehabilitation interventions (14). Nurses are often present with the patient "24/7" and thus spend more time with the patient than other team members. Currently, there is a shift towards a proactive approach in rehabilitation care in the sense that nurses provide healthcare to the patient, not just for him, thus encouraging him to participate in his care as much as possible (15). Research indicates that patients after musculoskeletal surgery need multidisciplinary care due to their low quality of life (16), which is lower than the quality of life of the general population (17). Diseases of the musculoskeletal system limit the ability to move through joint dysfunction and pain. Surgery and postoperative rehabilitation improve the above but do not ensure complete recovery and mobility (18).

Aim

The aim of this research was to examine the quality of life of patients after musculoskeletal surgery and rehabilitation and to examine the quality of life after musculoskeletal surgery and rehabilitation concerning gender, age, diagnosis, and comorbidities.

Methods

The research was conducted in the Bizovačke Toplice Spa during March and April 2023 as a cross-sectional study (19). The participants are patients after musculoskeletal surgery and rehabilitation at the inpatient treatment in the Bizovačke Toplice Spa for 21 days. The inclusion criteria were: 18 years of age and above, cognitively preserved, understanding and speaking the Croatian language, and voluntarily agreeing to fill out the survey questionnaire. The participants filled out the questionnaire upon discharge.

Ethics

The research was conducted under all valid guidelines, including the basics of good clinical practice, the Declaration of Helsinki, the Health Care Act of the Republic of Croatia, and the Patients' Rights Protection Act of the Republic of Croatia. The Ethics Committee of the Bizovačke Toplice Spa (14/2023/1) and the Ethics Committee of the Faculty of Dental Medicine and Health (2158/97-97-10-23-33.) gave their consent and approval for the implementation of this research.

Procedure

The research was explained to the participants in a way they could understand, and if they agreed to participate in the study, they were given an informed consent form to sign. After signing the informed consent form, the participants filled out the questionnaire independently. The completed questionnaire was returned in sealed envelopes to ensure anonymity. An anonymous questionnaire consisting of two parts was used as a research instrument. In the first part, the respondents answered questions about age, gender, place of residence, type of surgery, and comorbidities. In the second part of the survey, a Croatian example of a questionnaire licensed by the School of Public Health "Andrija Štampar" was used. The questionnaire is related to the self-assessment of the quality-of-life SF-36 (Short form 36 Health Survey Questionnaire) (17). The questionnaire has a total of 36 questions covering: the way of physical functioning, limitations caused by physical problems, physical pain, overall health, vitality, social functioning, limitations caused by psychological problems, and psychological health. The SF-36 questionnaire is a very popular instrument for assessing quality of life and is used worldwide to assess health-related quality of life (20).

Statistics

Descriptive statistical methods were used to describe the frequency distribution of the investigated variables. Mean values are expressed as arithmetic mean, minimum and maximum value, and standard deviation. The t-test for independent samples was used to examine the differences in results between two independent groups of subjects, while the one-way analysis of variance was used to examine the differences between several independent variables. The Kolmogorov-Smirnov test was used to test the normality of the distribution. A value of $p<0.05$ was taken as the level of statistical significance. The statistical package IBM SPSS 25, Chicago, USA, was used for processing.

Results

Table 1. **Distribution of demographic and surgical variables**

		N (%)
Gender	Male	34 (35.4)
	Female	62 (64.6)
Residence	City	53 (55.2)
	Village	40 (41.7)
	Suburban settlement	3 (3.1)
Type of surgery	Knee surgery	35 (36.5)
	Hip surgery	44 (45.8)
	Spine surgery	14 (14.6)
	The rest	3 (3.1)
Comorbidities	Diabetes	9 (9.4)
	High blood pressure	23 (24)
	Obesity	5 (5.2)
	The rest	3 (3.1)
	Diabetes and high blood pressure	6 (6.3)
	High blood pressure and obesity	5 (5.2)
	Diabetes, high blood pressure and obesity	2 (2.1)
	No comorbidities	43 (44.8)
	M (min-max)	**SD**
Age	63 (18-91)	13.59

A total of 96 participants took part in the research, 62 (64.6%) were female, 53 (55.2%) lived in urban areas, 44 (45.8%) had hip surgery and 43 (44.8%) had no comorbidities. The mean age of the participants is 63 years (ranging from 18 to 91 years) (Table 1).

Table 2. **Descriptive statistics of subscales of the SF 36 questionnaire**

	M (min-max)	SD
Physical functioning	47.03 (0-100)	28.80
Limitation due to physical disabilities	32.81 (0-100)	42.03
Limitation due to emotional difficulties	48.26 (0-100)	45.33
Vitality and energy	46.56 (5-85)	17.55
Mental health	58.20 (0-100)	17.84
Social functioning	53.77 (0-100)	23.51
Physical pain	49.21 (0-100)	24.33
Perception on general health	48.12 (5-90)	18.82

The best assessment of the participants was expressed in the aspect of mental health M=58.20 (SD=17.84), while the lowest was in the limitation due to physical difficulties M=32.81 (SD=42.03) (Table 2).

The results showed that there is a significant difference according to the gender of the participants in physical functioning (T=2.318; p=0.02), vitality and energy (T=3.351; p=0.001), mental health (T=2.310; p=0.003), social functioning (T=2.044; p=0.04), perception of general health (T=2.739; p=0.007), significantly better physical functioning, vitality and energy, psychological health, social functioning and perception of general health are shown by male participants compared to female participants (Table 3).

The participants were divided into three categories according to age, which were determined so that there would be an approximately equal number of participants in each group.

The Tukey post hoc test showed that participants aged 50 years and younger were significantly worse (One-way analysis of variance; F=2.540; p=0.01; Tukey post hoc; $p<0.05$) when their limitation due to physical disabilities according to the condition of participants aged 51 to 60 and 61 and older was assessed. The Tukey post hoc test showed that there were no significant differences between the groups of 51 to 60 years and 61 years and older (Table 4).

The results showed that participants who have comorbidities evaluate their physical functioning significantly better (t-test; T=2.044; p=0.04) and that participants who had no comorbidities estimate a significantly higher limitation due to physical difficulties (t-test; T=2.357; p= 0.01) (Table 5).

Table 3. **Results of the subscales of the SF 36 questionnaire by gender**

	Gender				
	Male		Female		
	M (range)	SD	M (range)	SD	*p**
Physical functioning	58.02 (5-95)	23.95	42.09 (0-100)	30.19	**0.02**
Limitation due to physical disabilities	28.68 (0-100)	42.25	35.08 (0-100)	42.09	0.47
Limitation due to emotional difficulties	51.96 (0-100)	45.08	46.23 (0-100)	45.71	0.55
Vitality and energy	54.26 (5-85)	19.29	42.33 (0-100)	14.61	**0.001**
Mental health	63.76 (12-100)	19.64	55.16 (16-88)	16.14	**0.003**
Social functioning	60.29 (12-100)	25.27	50.20 (0-100)	21.88	**0.04**
Physical pain	52.94 (5-90)	26.77	47.17 (15-85)	22.86	0.26
Perception on general health	55 (0-100)	22.29	44.35 (0-100)	15.56	**0.007**

* t test

Table 4. **Results of the subscales of the SF 36 questionnaire according to the age of the participants**

	Age Number of respondents (%)						
	50 and younger 28 (29.16)		51-60 36 (37.5)		61 and older 32 (33.33)		
	M (range)	SD	M (range)	SD	M (range)	SD	*p**
Physical functioning	54.64 (0-100)	26.41	53.42 (0-85)	24.44	43.41 (0-85)	30.21	0.23
Limitation due to physical disabilities	16.07 (0-100)	28.76	56.57 (0-100)	44.75	29.36 (0-100)	21.28	**0.01**
Limitation due to emotional difficulties	33.33 (0-100)	25.29	61.40 (0-100)	39.90	47.61 (0-100)	46.64	0.21
Vitality and energy	47.85 (10-85)	21.27	52.36 (20-75)	15.03	44.52 (5-85)	17.22	0.22
Mental health	58.57 (12-88)	21.88	63.15 (20-100)	18.40	56.63 (16-100)	16.71	0.38
Social functioning	50.00 (0-100)	32.88	62.50 (25-100)	19.54	51.98 (0-100)	21.90	0.18
Physical pain	45.35 (10-100)	27.99	58.94 (30-100)	24.85	47.14 (10-100)	23.04	0.14
Perception on general health	51.78 (20-90)	24.38	52.89 (5-85)	16.52	45.87 (5-85)	17.99	0.26

* One-way analysis of variance

Table 5. **Results of the subscales of the SF 36 questionnaire according to comorbidities**

	Comorbidities				
	No		Yes		
	M (range)	SD	M (range)	SD	*p**
Physical functioning	40.58 (0-95)	28.20	52.26 (0-100)	28.48	**0.04**
Limitation due to physical disabilities	21.51 (0-100)	35.17	41.98 (0-100)	40.14	**0.01**
Limitation due to emotional difficulties	41.86 (0-100)	45.47	53.45 (0-100)	44.97	0.21
Vitality and energy	43.60 (10-85)	17.46	48.96 (5-85)	17.41	0.13
Mental health	56.55 (20-100)	18.32	59.54 (12-100)	17.51	0.41
Social functioning	49.70 (0-100)	24.16	57.07 (12.50-100)	22.66	0.12
Physical pain	44.41 (10-100)	23.03	53.11 (10-100)	24.88	0.08
Perception on general health	48.48 (15-90)	21.28	47.83 (5-85)	16.77	0.86

* t test

No significant difference was obtained concerning the type of surgery performed in physical functioning (One-way analysis of variance; (F=1.240; *p*=0.30), limitation due to physical difficulties (F=0.617; *p*=0.60), limitation due to emotional difficulties (F=2.070; *p*=0.11), vitality and energy (F=0.053; p=0.98), mental health (F=0.576; *p*=0.63), social functioning (F=1.131; *p*=0.34), body pain (F=1.321; *p*=0.27), and perception of general health (F=0.731; *p*=0.53) after musculoskeletal surgery and rehabilitation.

Discussion

The lowest assessment of the quality of life of the participants in this research was expressed in the aspect of limitations due to physical difficulties. Male participants rated a higher quality of life after surgery and rehabilitation compared to female participants. Also, the participants who have various comorbidities evaluate their quality of life as higher than the participants without comorbidities.

Through general demographic data, a difference in diseases of the musculoskeletal system by gender is visible. Women at an older age are often affected by osteoarthritis, caused by the aging process itself, but additionally stimulated by menopause and the lack of hormones which enhance bone health (21). The number of women undergoing musculoskeletal system surgeries is significantly higher than the number of men (21). In addition to the above, women also experience more serious symptoms and disability caused by the disease, and despite that, women often avoid visiting the doctor due to problems with movement and pain, although they decide to undergo surgery in equal numbers as members men (21). The results of this research indicate that significantly better physical functioning is shown by male participants compared to women. Global research indicates that a greater number of comorbidities is associated with an increased level of pain, reduced physical function, and a worse quality of life (22, 23).

There are no significant differences in limitations due to emotional difficulties according to demo-

graphic and surgery-related variables. The results are the identical according to the type of surgery as well as according to comorbidities, which means that emotional difficulties in this study are lower in diseases, surgery, and rehabilitation of the musculoskeletal system compared to other difficulties. However, emotional difficulties are present and are estimated to be lower than in the general population (17). The results of this research indicate that male participants show significantly better mental health, vitality, and energy compared to female participants. Also, women lose vitality as a result of the surgical procedure, and they often develop depression due to a change in condition or dissatisfaction with their abilities (24, 25).

Significantly better social functioning in this research is shown by male participants compared to women. Rehabilitation after orthopedic surgery is not a guarantee of the return of total mobility, and in combination with the age of the participants, there is a decline in physical function. In women, it often implies the loss of the family role as a caregiver, and beginning of taking care of themselves (26).

There are no significant differences in physical pain according to demographic data and variables related to surgery in this study, but pain is present and other studies indicate that pain is the cause of a large number of other problems (27).

In this research, male participants showed a significantly better perception of general health compared to female participants. Other studies show equal results between the sexes, without significant differences in the perception of health (28).

The results of the research by Gordon et al. (2014) indicate that the age of the participants is negatively related to physical functioning, vitality and energy, psychological health, and general health, that is, the older the participants are, the worse the physical functioning, vitality and energy, psychological and general health. Older people assess their health worse than younger people. The greater the difference in age, the greater the difference in assessment (29). In this research, the younger participants estimated their limitations due to physical difficulties as significantly worse than the older participants. The results obtained indicate that younger participants perceive their condition and quality of life as worse because they are suddenly limited in performing activities due to poor health, while older participants have come to terms with the fact that they are limited due to physical difficulties and do not perceive their current condition as dramatically. Furthermore, the results of other research indicate that problems arise through the perception of one's state and the influence of one's thoughts on the quality of life (30).

The participants with comorbidities rate their physical functioning significantly better compared to participants without comorbidities. Other studies indicate the opposite: comorbidities reduce the quality of life and physical function (31). The opposite assessment of the participants in this study compared to the results of other studies could be explained through the subjectivity of the assessment, meaning that people with comorbidities better assess their physical function as part of reduced function following surgery due to a previous worse condition caused by comorbidities. A significantly higher limitation due to physical difficulties is estimated by participants without comorbidities compared to the participants with comorbidities. The reduction of physical function and movement limitation is directly related to comorbidities (32, 33). The participants without comorbidities have a harder time accepting new difficulties and adapting, and thus negatively assess the quality of life, which is a subjective assessment (34).

The limitation of this research is that the participants came to rehabilitation at different times, between six and twelve weeks after the surgery, which could affect the perception of the quality of life.

Conclusion

The results of the conducted research indicate that after musculoskeletal system surgery and rehabilitation, the participants assess the quality of life at the lowest level in terms of limitations due to physical difficulties. Male participants estimate a higher quality of life after surgery and rehabilitation compared to females, through better physical functioning, assessment of greater vitality and energy, better psychological health, better social functioning, and a better perception of general health. Poorer quality of life is assessed by younger participants and participants without comorbidities.

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KVALITETA ŽIVOTA BOLESNIKA NAKON OPERACIJE LOKOMOTORNOG SUSTAVA I PROVEDENE REHABILITACIJE

Sažetak

Uvod. Rehabilitacija podrazumijeva oblik zdravstvene zaštite koji je usmjeren na vraćanje i održavanje tjelesne snage i mobilnosti s krajnjim ciljem postizanja najboljih mogućih rezultata.

Cilj. Ispitati kvalitetu života bolesnika nakon operacije lokomotornog sustava i provedene rehabilitacije u odnosu na dob, spol, dijagnozu i komorbiditete.

Metode. Ispitivanje je provedeno kao presječna studija. Sudionici su bolesnici nakon operacije lokomotornog sustava i provedene rehabilitacije na stacionarnom liječenju u Lječilištu Bizovačke toplice u trajanju od 21 dan. Primijenjen je anonimni anketni upitnik s demografskim podacima te upitnik samoprocjene kvalitete života SF-36.

Rezultati. U istraživanju je sudjelovalo 96 sudionika, ženskog spola bilo ih je 62 (64,6 %), operaciju kuka imalo je 44 (45,8 %) te ih 43 (44,8 %) nema komorbiditeta. Srednja je vrijednost dobi sudionika 63 godine (raspona od 18 do 91 godine). Sudionici u dobi od 50 godina i mlađi znatno lošije procjenjuju svoje ograničenje zbog tjelesnih poteškoća. Sudionici muškog spola procjenjuju statistički značajno bolju kvalitetu života nakon operacije i rehabilitacije u usporedbi sa ženskim spolom, kroz bolje tjelesno funkcioniranje, procjenu veće vitalnosti i energije, bolje psihičko zdravlje, bolje socijalno funkcioniranje te bolju percepciju općeg zdravlja. Različite dijagnoze sudionika i provedeni operacijski zahvati nisu značajno povezani s kvalitetom života nakon operacije lokomotornog sustava i provedene rehabilitacije.

Zaključak. Najniža procjena kvalitete života sudionika iskazana je u aspektu ograničenja zbog tjelesnih poteškoća. Lošiju kvalitetu života procjenjuju sudionici ženskog spola, mlađi te sudionici bez komorbiditeta.

Ključne riječi: kvaliteta života, lokomotorni sustav, rehabilitacija, SF-36

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Professional paper

The Future of Triage: The Analysis of Traditional Methods Compared to ChatGPT

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Keywords: ChatGPT, nursing, triage

Abstract

Introduction. Triage is the assessment of the patient's condition in order to determine the urgency of treatment. It is usually performed by a nurse, often using a five-level protocol.

Aim. To conduct a comparative analysis of the accuracy of categorization and diagnosis between ChatGPT (a chatbot which uses machine learning algorithms) and traditional medical triage, as well as to provide recommendations on how artificial intelligence can improve the work of medical professionals in patient triage.

Methods. The literature selected for comparison is "Emergency Nursing: 5-Tier Triage Protocols". The most common diagnoses for which patients present to the emergency department were selected for research. Then, triage categories were selected and case presentations were created. These cases were presented to ChatGPT, and its responses were compared with the literature.

Results. ChatGPT correctly categorizes triage cases in 43.33% of cases, with an average category difference of 0.7. Although it made mistakes in 1 or 2 categories in some cases, it assigned diagnoses to a higher category for patient safety.

Discussion. Comparison with other studies shows that errors occur in up to 40% of nurse decisions due to various factors such as inexperience, speed of work, and a large number of patients, which could be reduced by additional artificial intelligence assistance. It is necessary to take into account factors that artifi-

cial intelligence cannot take over and that it can only be a help, not a substitute for medical personnel.

Conclusion. ChatGPT has potential for usage in medical triage, but with improvements in specialized training of models on medical data and terminology to improve the accuracy and reliability of the model.

Introduction

Triage is a preliminary assessment of a patient's condition with the aim of determining the urgency of their need for treatment. It is a process which helps ensure that patients receive timely and appropriate care based on the severity of their condition. It is typically conducted by nurses using a set of established protocols designed to help them rapidly and accurately assess the patient's condition and determine the appropriate level of care (1). One of the triage protocols used is the five-level protocol. The level depends on the urgency at which the patient needs treatment and is divided into: the first level, where the patient requires immediate resuscitation, intubation, or emergency surgery; the second level, where there is a potentially life-threatening condition which requires urgent assessment and treatment (e.g., severe bleeding, chest pain, breathing difficulties); the third level, where the patient needs prompt attention, but is not in a life-threatening condition (e.g., bone fracture, moderate pain, fever); the fourth level, which includes conditions requiring medical attention within a few hours (e.g., minor cut, mild allergic reactions); and the fifth level, where the patient can wait for several hours or days (e.g., ankle sprain, minor rash). Protocols are categorized by the diagnose and are based on symptoms, with questions for each diagnosis which aid the nurse in assessing the patient's condition (1). With the development of technology and artificial intelligence capabilities, the question arises whether this process should be digitalized for faster processing. Chat robots like ChatGPT have been developed to assist with everyday human tasks. The question is whether artificial intelligence can aid in triage by using machine learning algorithms to analyze patients' symptoms and provide guidance to healthcare professionals. While chat robots have the potential to revolutionize the triage process, it's important to evaluate their effectiveness compared to traditional nurse triage protocols (2).

The aim of this research paper is to conduct a comparative analysis of traditional nurse triage protocols and ChatGPT's responses to case scenarios. The efficiency and accuracy of ChatGPT's responses to a prompt with case scenarios will be studied and compared with the existing data from the literature. The importance of this research is to evaluate the efficiency and accuracy of ChatGPT's categorization of medical cases and its ability to propose accurate diagnoses based on provided symptoms. This analysis is conducted to provide insights into the potential benefits and limitations of using ChatGPT for triage and to recommend how artificial intelligence can enhance the work of healthcare professionals. The research questions are: how does ChatGPT categorize medical cases into triage categories compared to categorization based on literature, what diagnoses does ChatGPT propose for given case presentations, and can ChatGPT be considered a useful tool for practical medical triage?

The hypotheses are that ChatGPT can effectively categorize medical cases into triage categories in accordance with recommendations from the literature, it can accurately provide diagnoses for given case presentations, and that it is a useful tool for practical medical triage.

The contributions of this research include a comparative analysis of traditional nurse triage protocols and ChatGPT, investigating the efficiency, accuracy, benefits and limitations of ChatGPT, as well as recommendations for improving the work of healthcare professionals using artificial intelligence.

Methods

In this research, a thorough literature review was conducted to select relevant literature for comparing data with the ChatGPT model. The book which was chosen was the "Emergency Nursing: 5-Tier Triage Protocols", published in 2020 (1). The research included the most common diagnoses for which

patients come to emergency departments, including cardiac arrest, cerebrovascular insult, chest pain, abdominal pain, allergic reactions, traumatic injuries, viral and bacterial respiratory diseases, breathing difficulties, burns, hypothermia, and diabetes related issues. Under each diagnosis, the triage categories and symptoms per category are listed. For the purposes of the research, three categories (out of a total of five) were randomly selected for each diagnosis. The random selection of triage categories serves multiple purposes. Firstly, it prevents intentional bias in the selection process, avoiding patterns which could inadvertently favor the model's training data. Randomization reduces the risk of favoring specific cases and ensures a representative sample for assessing ChatGPT's generalization across diverse medical conditions. This approach introduces variability, exposing the model to a spectrum of complex and less complex cases, thereby challenging it and revealing strengths and weaknesses. By simulating a realistic scenario where healthcare professionals encounter diverse cases daily, randomization contributes to the generalizability of the evaluation. Moreover, it mitigates the risk of model overfitting to specific categories during training, ensuring a more comprehensive and unbiased assessment. For the diagnosis of stroke and breathing difficulties, categories 1, 2 and 4 were chosen; for allergic reactions, chest and abdominal pain, categories 1, 2 and 3 were chosen; for traumatic injuries, burns and diabetes related issues, categories 2, 3 and 4 were chosen; for hypothermia, categories 2, 3 and 5 were chosen and for respiratory infections, categories 1, 3 and 4 were chosen. Only three categories were chosen to challenge the ChatGPT model in the triaging process. If all five categories were included, the model would distinguish between the categories more easily, potentially deviating from real in-hospital situations. A total of 30 case scenarios were analyzed to determine how ChatGPT triages the given patients and what diagnoses it suggests based on the written symptoms. The case scenario was presented to ChatGPT as patient exhibiting symptoms listed under the selected category from the previously mentioned book "Emergency Nursing: 5-Tier Triage Protocols". Such case scenarios were presented to ChatGPT with the following prompt: "Here are 5 emergency cases, read each of them, then categorize them into triage categories using the 5-Tier Triage Protocol and suggest a potential diagnosis." To avoid errors due to the character limit which ChatGPT can process and the length of responses, 5 cases were written in one question. After recording ChatGPT's responses, they were compared to the literature to assess accuracy. The model used was the basic ChatGPT-3, available on the Internet for free.

Results

In Table 1, diagnoses taken from the literature, diagnoses which ChatGPT assumed based only on those symptoms, triage categories in which those symptoms are classified according to the literature, the category in which ChatGPT triaged, the accuracy of ChatGPT's responses compared to the literature (correct-incorrect), and the difference in categories between the literature and ChatGPT (how much ChatGPT has erred) are shown.

The results of this study show that ChatGPT can classify medical cases into triage categories in accordance with literature recommendations, but with an 43.33% accuracy. The average difference in categorization between ChatGPT and literature is 0.7. When individual cases are examined, ChatGPT made errors for 2 categories in the 4th category of stroke, the 4th category of breathing difficulties, the 4th category of burns, and the 3rd category of diabetes related issues. It made errors for 1 category in the 2nd and 3rd categories of traumatic injuries, the 2nd category of breathing difficulties, the 2nd and 3rd categories of burns, the 2nd and 3rd categories of hypothermia, the 2nd and 3rd categories of chest pain, the 4th and 3rd categories of respiratory infections, and the 2nd and 4th categories of diabetes related issues. Cases where ChatGPT categorized correctly include the 1st and 2nd categories of stroke, categories 1-3 of allergic reactions, the 4th category of traumatic injuries, the 1st category of breathing difficulties, the 5th category of hypothermia, the 1st category of chest pain, categories 1-3 of abdominal pain, and the 1st category of respiratory infections.

In all cases where ChatGPT misclassified, it tended to categorize at a higher level, indicating a positive pattern where it prioritizes patient safety when there is insufficient information or when it perceives that the symptoms mentioned may indicate a more seri-

Table 1. **Comparison of ChatGPT's responses with sources from literature**

DIAGNOSIS LITERATURE	DIAGNOSIS CHATGPT	CATEGORY LITERATURE	CATEGORY CHATGPT	ACCURACY OF CHATGPT RESPONSE	DIFFERENCE BETWEEN CHATGPT AND LITERATURE CATEGORY
Stroke	Anaphylaxis or allergic reaction	1	1	+	0
Stroke	Stroke	2	2	+	0
Stroke	Neurological disorder	4	2	-	2
Allergic reaction	Acute airway obstruction	1	1	+	0
Allergic reaction	Anaphylaxis or angioedema	2	2	+	0
Allergic reaction	Allergic reaction or viral disease	3	3	+	0
Traumatic injury	Fracture or dislocation	2	1	-	1
Traumatic injury	Fracture	3	2	-	1
Traumatic injury	Fracture	4	4	+	0
Breathing difficulties	Heart attack or asthma attack	1	1	+	0
Breathing difficulties	Airway obstruction, severe allergic reaction	2	1	-	1
Breathing difficulties	Respiratory infection or pneumonia	4	2	-	2
Burn	3rd degree burn	2	1	-	1
Burn	Severe burn, possible airway involvement	3	2	-	1
Burn	2nd degree burn with signs of deep infection	4	2	-	2
Hypothermia	Hypothermia	2	1	-	1
Hypothermia	2nd degree frostbite	3	2	-	1
Hypothermia	Mild hypothermia	5	5	+	0
Chest pain	Cardiac arrest	1	1	+	0
Chest pain	Cardiac arrest	2	1	-	1
Chest pain	Deep vein thrombosis or cardiac arrest	3	2	-	1
Abdominal pain	Respiratory arrest, sepsis, cerebrovascular insult	1	1	+	0

Table 1. **Comparison of ChatGPT's responses with sources from literature**

DIAGNOSIS LITERATURE	DIAGNOSIS CHATGPT	CATEGORY LITERATURE	CATEGORY CHATGPT	ACCURACY OF CHATGPT RESPONSE	DIFFERENCE BETWEEN CHATGPT AND LITERATURE CATEGORY
Abdominal pain	Gastrointestinal bleeding	2	2	+	0
Abdominal pain	Appendicitis	3	3	+	0
Respiratory infection	Acute asthmatic attack, pneumonia, COVID-19	1	1	+	0
Respiratory infection	Respiratory infection	3	2	-	1
Respiratory infection	Bacterial infection	4	3	-	1
Diabetes related issued	Severe hypoglycemia, diabetic ketoacidosis	2	1	-	1
Diabetes related issued	Diabetic ketoacidosis	3	1	-	2
Diabetes related issued	Did not provide a diagnosis	4	3	-	1
TOTAL				43.33%	0.7

ous problem. When it comes to ChatGPT's ability to provide diagnoses based on provided symptoms, it performed well in most cases, even offering multiple diagnoses in some instances. The only case where it didn't provide a diagnosis was in the 4th category of diabetes related issues. The results presented in Table 1 indicate that ChatGPT is not a reliable tool for diagnosis. For instance, in the reference book, symptoms listed for stroke in category 1 include severe respiratory distress, paleness, diaphoresis, lightheadedness or weakness, and unresponsiveness. These symptoms also overlap with those of a category 1 allergic reaction. Consequently, ChatGPT failed to distinguish between the two due to the similarity in symptoms. This same behavior can be seen with some other diagnoses because ChatGPT lacks specific medical training and has limited understanding of the context in which the situation is happening.

Discussion

Research conducted in Turkey showed that the accuracy rate of decisions made by nurses in triage was 59.3%, meaning that 40.7% of decisions were incorrect (3). Additionally, research by Chen J. C. and colleagues (4) reported a 40% inaccuracy rate in nurses triage decisions, while in the study by Jordi K. and colleagues (5), it was 40.4%. The research from Turkey suggests that the number of patients in the emergency department significantly affects triage accuracy, with larger patient volumes leading to lower triage accuracy (3). It has also been demonstrated that nurses sometimes struggle with patient categorization and require more time, with approximately half of the patients who presented to the emergency department being placed in the 3rd category (3). Another factor affecting triage is the experience of the nurse, with those having less than a year of experience making about 10% more errors than those with around 4 years of experience (3). When taking these factors into con-

sideration, even though ChatGPT's categorization accuracy is 43.33%, the average difference in categories between ChatGPT and literature is only 0.7, which is a relatively small difference considering the impact of the mentioned factors on triage speed and accuracy. It's important to note that in cases where ChatGPT misclassified, it tended to categorize at a higher level, thereby prioritizing patient safety (3).

The results of Benoit J.R.A.'s study show that ChatGPT is successful in diagnosing simple cases in 71.1% of cases and correctly triaging 57.8% of cases (2). The higher percentage in this study is due to several factors. The author categorized cases into three types: emergencies, non-emergencies, and cases which can be managed at home. This is not a standard categorization, and it is unclear how emergency cases were ranked. The experiment's data do not specify how case scenarios were presented, only that they were simple scenarios. This study has raised questions about ChatGPT's capabilities in triage and presents opportunities for further research (2).

A cross-sectional study by İbrahim et al. evaluated the performance of ChatGPT in predicting triage categories in an Emergency Room (ER) setting. The researchers generated case scenarios based on the Emergency Severity Index. Two independent ER specialists categorized the cases, and a third specialist resolved any conflicting categorizations. ChatGPT was then used to predict triage categories, and its performance was compared to expert classifications. The study found fair agreement between ChatGPT and ER specialists, with a Cohen's Kappa of 0.341. The sensitivity for high acuity cases was 76.2%, while specificity was 93.1%. The study suggests that ChatGPT, while showing promise in distinguishing high acuity cases, has limitations in accurately predicting triage categories overall. The researchers recommend further validation with larger datasets and highlight the importance of considering the subjective nature of triage and potential biases in the decision-making process (6).

A study conducted by Gebrael G. et al. demonstrated a diagnostic performance of 87.5% using ChatGPT in emergency cases for patients with metastatic prostate cancer. The study highlighted limitations in determining the need for hospital admission. The researchers underscored the significance of developing an AI model for this purpose and emphasized the potential benefits of utilizing AI in emergency room settings (7).

Researchers who compared the diagnostic and triage accuracy of ChatGPT 3.5, ChatGPT 4.0, Ada and WebMD showed that in the diagnostic analysis, ChatGPT 3.5 exhibited the highest diagnostic accuracy, with a top-3 diagnostic match rate of 63%. However, it also had a concerning high unsafe triage rate of 41%, signifying instances where the triage recommendations could be potentially harmful or inappropriate. On the other hand, ChatGPT 4.0 demonstrated lower diagnostic accuracy compared to ChatGPT 3.5, with a top-3 diagnostic match rate of 50%. However, it presented a notably lower unsafe triage rate of 22% and achieved the highest triage agreement rate (76%) with the physicians among all models. This suggests that ChatGPT 4.0, despite its reduced diagnostic accuracy, performed better in terms of providing triage recommendations which align with physician's assessments while minimizing unsafe suggestions (8).

Despite its low accuracy, ChatGPT has demonstrated some positive results in diagnosing and categorizing cases. This suggests the potential for improvement through additional specialized training and model optimization for medical purposes. ChatGPT has the potential to expedite triage and assist less experienced healthcare professionals, but its accuracy is not high enough to rely solely on its responses.

Of course, there are aspects which ChatGPT cannot replace, such as empathy, human touch and comforting words which are essential when patients are in panic or pain and seeking help. Individuals also display a range of nonverbal signals, such as body language and facial expressions, which can offer valuable insights into a patient's condition, which require human observation. There is also a responsibility issue, i.e. if a healthcare provider relies on ChatGPT, they must bear the responsibility if a negative outcome occurs. In general, while ChatGPT has the potential to assist in medical triage, it should be considered a tool which adds to the knowledge and work of nurses rather than replacing them.

Conclusion

By analyzing the presented research results, we can assess how ChatGPT categorizes medical cases in triage compared to literature-based categorization and the diagnoses it provides for given case presentations. The overall accuracy of ChatGPT's responses is 43.33%, with an average category difference of 0.7 compared to the literature. Based on these results, we can examine the hypotheses put forth. The first hypothesis was that ChatGPT can effectively categorize medical cases into triage categories according to literature recommendations. The results show variable accuracy of ChatGPT in categorizing medical cases into triage categories. While some cases align with the literature, there are deviations in others. Therefore, we cannot fully confirm this hypothesis at this time. The second hypothesis was that ChatGPT can accurately diagnose given case presentations. ChatGPT provides different diagnoses for given case presentations, but the accuracy of these diagnoses varies. Therefore, this hypothesis is also partially confirmed, with room for improvement. The third hypothesis was that ChatGPT is a useful tool for practical medical triage. Considering the variable accuracy and consistency of ChatGPT in diagnosing and categorizing cases, we cannot currently consider ChatGPT as an accurate tool for practical medical triage. Therefore, this hypothesis cannot be confirmed at this time. However, the research results highlight the potential of artificial intelligence in the clinical environment, and with further improvement and model adaptation, better accuracy and reliability can be achieved. In conclusion, ChatGPT shows potential for usage in medical triage, but its current level of accuracy and consistency does not justify its independent use in medical practice. Based on the findings, future research is recommended to focus on specialized training of the model using medical data and terminology to enhance its accuracy and reliability in the context of medical triage. It would be valuable to assess ChatGPT's accuracy on real case presentations, explore its applicability in the emergency department, and make comparisons between the triage results of nurses and ChatGPT.

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BUDUĆNOST TRIJAŽE: ANALIZA TRADICIONALNIH POSTUPAKA U USPOREDBI S CHATGPT-jem

Sažetak

Uvod. Trijaža je procjena stanja pacijenta u cilju utvrđivanja hitnosti liječenja. Trijažu obično provodi medicinska sestra, najčešće s pomoću protokola u pet razina.

Cilj. Provesti komparativnu analizu točnosti kategorizacije i dijagnostike ChatGPT-ja (robota za chat koji primjenjuje algoritme strojnog učenja) u medicinskoj trijaži, kao i dati preporuke na koji način umjetna inteligencija može poboljšati rad medicinskih djelatnika u trijaži pacijenata.

Metode. Literatura odabrana za usporedbu jest Emergency Nursing: 5-Tier Triage Protocols. Za istraživanje su odabrane najčešće dijagnoze zbog kojih se pacijenti javljaju u hitnu službu. Zatim su odabrane kategorije trijaže koje će se primijeniti te su formirani prikazi slučajeva. Ti su se slučajevi postavili ChatGPT-ju, nakon čega su se uspoređivali njegovi odgovori s literaturom.

Rezultati. ChatGPT točno razvrstava slučajeve trijaže u 43,33 %, s prosječnom razlikom kategorije od 0,7. Iako je negdje pogriješio za jednu ili dvije kategorije, postavio je dijagnoze na višu kategoriju u svrhu osiguravanja sigurnosti pacijenta.

Rasprava. Pregledom literature utvrđeno je da se pogreške događaju u čak 40 % odluka medicinskih sestara zbog raznih čimbenika poput neiskustva, brzine rada i velikog broja pacijenata, što bi mogla umanjiti dodatna pomoć umjetne inteligencije. Potrebno je uzeti u obzir čimbenike koje stroj ipak ne može preuzeti te da može biti samo pomoć, a ne i zamjena medicinskog djelatnika.

Zaključak. ChatGPT ima potencijal za primjenu u medicinskoj trijaži, ali uz poboljšanja u smislu specijalizirane obuke modela na medicinskim podacima i terminologiji kako bi se poboljšala točnost i pouzdanost modela.

Ključne riječi: ChatGPT, sestrinstvo, trijaža

Parents' Perception of Febrile Seizures in Children

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Abstract

Aim. To examine the perception of parents of children suffering from febrile seizures in relation to management procedures for febrile seizures, parents' gender, and their opinion regarding the need for additional education.

Methods. The cross-sectional study was conducted at the Department of Pediatrics, Osijek Clinical Hospital Centre, in February and March 2023. The respondents were 32 parents of children hospitalized for febrile seizures. A questionnaire on parents' perception of febrile seizures was used.

Results. There were 32 respondents, 15 (47%) male and 17 (53%) female. A total of 20 (62%) respondents were not aware that their child was having a febrile seizure attack, 6 (19%) respondents thought their child was dying, and 4 (13%) respondents thought their child was losing consciousness. During seizure, a significant number of respondents, 16 (50%), of them, felt fear as the dominant emotion, and 13 (41%) respondents felt panic. A total of 9 (28%) respondents felt ready for recurrent febrile seizure, while 6 (19%) respondents were not or could not assess their readiness. A total of 29 (91%) respondents believed that they needed additional education.

Conclusion. Parents are mostly unaware that their child is having a febrile seizure and feel fear and panic. Male parents call emergency medical services significantly more often than female parents. Parents are not sufficiently prepared for the recurrent seizures, and most of them believe that they need additional education.

Introduction

Febrile seizures (FS) are a form of cerebral attacks which occur in young children, usually between 6 months and 5 years of age, most often due to high fever (1). Although febrile seizures can be frightening, they usually do not cause serious medical conditions and do not leave long-term adverse effects (2). However, parents need to be educated to recognize the symptoms and signs of febrile seizures in time and seek medical help.

Etiology and epidemiology

The exact cause of febrile seizures is still unknown, although some studies indicate a possible connection with environmental and genetic factors (2). Several studies identified some of the risk factors: male gender, family history of febrile seizures, high body temperature, prenatal complications, low serum calcium level, low blood sugar level, microcytic hypochromic anemia, and zinc and iron deficiency (3-5).

Febrile seizures are the most common cerebral seizures in childhood, with an incidence of 2 to 5% in Europeans and Americans (3). A higher incidence was recorded in Japan (7-10%). The highest incidence is during the winter period as it is associated with various infectious and respiratory diseases (6).

Clinical presentation

The typical clinical picture of a febrile seizure includes loss of consciousness, disorientation, difficulty breathing, cyanosis, foaming at the mouth, eye rolling, fixed gaze, and generalized twitching of the arms and legs (3). After an attack, a child may become irritable, confused, or sleepy, but they fully recover and come to their senses after about 30 minutes (4). Febrile seizures are classified as either simple, which generally do not have long-term neurodevelopmental disorders and constitute 70% of all FS, or complex febrile seizures (3). Simple febrile seizure is a generalized seizure without focal features, without pre-existing neurological abnormalities, lasts less than 15 minutes, and there is no recurrence within 24 hours (7, 8). Complex febrile seizures are generalized seizures with focal features, usually with pre-existing neurological abnormalities, recurrences within 24 hours, lasting longer than 15 minutes, and require anticonvulsant therapy (7, 8).

Diagnosis and treatment

When establishing a diagnosis of febrile seizures, it is most important to take a detailed medical history and perform a physical examination (8). Key items when taking medical history include description and duration of seizure, family history of seizures or possible predisposition to epilepsy, recent illness, antibiotic use, and vaccination and immunization status for Haemophilus influenzae type B and Streptococcus pneumoniae (9, 10). Physical examination should look for signs of meningitis such as drowsiness, irritability, bulging fontanelle, occipital rigidity, and decreased muscle tone. Routine laboratory tests in children with simple febrile seizures are usually unnecessary because abnormalities in electrolytes are very rare (11). Further laboratory tests should be individualized and only prescribed after taking a detailed medical history and performing a physical examination (8). Electroencephalography has no role in the acute treatment of simple febrile seizures, and it cannot predict recurrence. It should be performed exclusively on children who experienced complex febrile seizures, have a positive family history of epilepsy or some other neurological diseases (10, 11). Any child with febrile seizures who exhibits symptoms and signs of meningitis should undergo a lumbar puncture (9).

According to the latest guidelines by Radić Nišević et al., children with simple febrile seizures should not be hospitalized at all if they are in good general condition and if the cause of fever is clear (11). The child can be discharged home after a short period of observation in a day hospital (11, 12). Seizures are mostly short-lived and stop spontaneously, not requiring prolonged treatment with antiepileptic therapy. Hospitalization is necessary if the seizure lasted longer than 15 minutes and was a complex one, if neurological abnormalities are present, serious infection is suspected or has unknown source, the child is under 18 months of age, and the parents or the caregivers are unable to provide quality monitoring of the child's condition at home (11, 12). In the acute phase, treatment is aimed at determining the cause of fever and symptomatic therapy. It is important to ensure adequate hydration of the child and to reduce body temperature with recommended combination of paracetamol and ibuprofen (4, 5). During the seizure itself, the first step is to

place the child on their side and to ensure an open airway and oxygen administration. The drug of choice in most cases is diazepam administered at the dose of 0.2 to 0.3 mg/kg intravenously. An alternative method is the use of rectal enema at a dose of 0.5 mg/kg. Rectal absorption of diazepam is very effective, occurring within a few minutes after proper application (11, 13). Benzodiazepines such as rectal diazepam or buccal midazolam may be prescribed for use at home as adjunctive therapy to stop seizures. They are useful for children with frequent seizures or for febrile seizures which last longer than 15 minutes and do not resolve spontaneously (11, 13).

Specifics in caring for children with febrile seizures and the importance of educating parents

The care of a child with febrile seizures is focused on identifying and treating the underlying cause of febrility and ensuring the child's safety during and after the seizure (13, 14). Nursing interventions include 24-hour monitoring of the child (observing the appearance and consciousness, monitoring vital functions, especially body temperature), and administering antipyretics as prescribed by the pediatrician if needed. During febrile seizure episodes, the most important aspect is to ensure the child's safety by placing them in a lateral position to maintain airway patency, then summoning a pediatrician, administering oxygen therapy, and prescribed anticonvulsant therapy (11, 13-15).

Parents often lack sufficient knowledge about high fever and the potential risk of febrile seizures (16). Studies conducted in the United States showed that 77% of parents with child experiencing their first seizure think the child is dying, while 15% think the child is choking or has meningitis. Parents who have had previous encounters with febrile seizures, in an alarming 21% of cases, place the child in the correct position during the seizure (12). Nurses are an important link in educating parents as they should explain to parents that febrile seizures are usually caused by high body temperature and are not indicative of epilepsy or other neurological diseases (12). Nurses should explain to parents the possible symptoms and signs of febrile seizures so that they can recognize them in time and react appropriately and educate them on the importance of applying antipyretic measures (11, 15). It is also important to educate parents about the rectal administration of diazepam or buccal administration of midazolam in the event of a recurrent seizure. Furthermore, teaching parents how to place the child in an appropriate position that ensures the patency of the airway and prevents the aspiration of vomited contents or accumulated saliva is crucial (16). Moreover, nurses should urge parents to contact emergency medical services in a case of recurrent seizure or take the child to the pediatric emergency room. Finally, nurses should provide emotional support to parents trying to alleviate anxiety, fear, and concern (11, 17).

The review of related literature found many studies on this topic. However, in the Republic of Croatia, a similar study on parents' perception of febrile seizures in children has not yet been conducted. Therefore, we decided to fill this gap.

Aim

To examine parents' perception of management procedures during febrile seizure in their children, explore parents' perceptions in relation to gender, and investigate opinions about the need for additional education.

Methods

The cross-sectional study was conducted at the Departments of Pediatrics, Pediatric Neurology, Genetics, Endocrinology, Metabolic Diseases and Rheumatology at Osijek Clinical Hospital Centre, in February and March 2023. The respondents were parents of children hospitalized for febrile seizures. A total of 32 respondents agreed to participate by completing the questionnaire in the given period. The questionnaire was completed at the time of discharge from hospital by only one parent.

The inclusion criteria were: a signed informed consent to participate in the study, stay at the Depart-

ment of Pediatrics due to child's hospitalization for febrile seizures, age 20 to 55 years, understanding and speaking Croatian language.

The exclusion criteria were: age less than 20 or greater than 55 years, unsigned informed consent to participate in the study, child's hospitalization for other illnesses and conditions, parents of children under one month of age.

Data protection

The personal data provided is processed in accordance with the General Data Protection Regulation (EU Regulation 2016/679) using appropriate physical, technical, and security measures. At any time, respondents have the right to request access, review, supplement, remove child's private information, and the right to restrict processing, data portability, as well as the right to withdraw consent.

Ethics

The research was conducted in accordance with all applicable guidelines aimed at ensuring proper implementation and safety of individuals participating in the study, including the basics of good clinical practice, the Helsinki Declaration, the Health Insurance Act of the Republic of Croatia, and the Patients' Right Protection Act of the Republic of Croatia. The study obtained approval from the Nursing Ethics Committee at Osijek Clinical Hospital Centre (R1-15971-2/2022) and the Ethics Committee at the Faculty of Dental Medicine and Health Osijek (602-01/23-12/05).

Instrument

The respondents were thoroughly explained the study in a comprehensible manner, and if they agreed to participate in the study, they received an informed consent form to sign. Once they signed the informed consent, the respondents independently completed the questionnaire. The respondents were informed that the questionnaire data and medical records data would be used in the study. They were also informed about the general and specific benefits of the study, its duration and type of procedures, the confidentiality of obtained data, privacy protection, voluntary participation, and the right to withdraw from participating during the study, noting that the mere refusal to participate has no impact on the medical care provided. The instrument which was used was a questionnaire based on the Febrile Seizures: Perceptions and Knowledge of Parents of Affected and Unaffected Children questionnaire (18). With obtained author's permission, the questionnaire was translated into the Croatian language and the section on perception was used in our questionnaire with minor adjustments. There were three sections of the questionnaire. The first section referred to the sociodemographic data of the respondents, including age, gender, level of education, and parents' occupation, as well as the child's age, gender, and number of febrile seizures. The second section of the questionnaire included objective questions on theoretical part about febrile seizures, body temperature, and parents' actions during febrile seizure attacks. The third part of the questionnaire referred to the parents' perception of febrile seizures. The perception section consisted of three parts. In the first part, the respondents had to assess their awareness during febrile seizure, determine the emotions (fear, panic, sadness) which dominated them, and assess those emotions on a scale from 0 to 10 (where 0 indicated the complete absence of the said emotion, while 10 denoted the maximum expression of the said emotion). Also, they were supposed to indicate who informed them that their child had a febrile seizure and at what body temperature value they started applying antipyretic measures. In the second part, they were given yes/no statements, while the third part of the section examined the parents' readiness for the next seizure and whether they needed additional education on febrile seizures.

Data Analysis

Categorical data were presented by absolute and relative frequencies. Numerical data were described by median and the limits of the interquartile range. Differences in categorical variables were tested with the $\chi 2$ test. All P values are two-sided. The significance level was set at α=0.05. The SPSS statistical program (version 22.0, SPSS Inc., Chicago, IL, USA) was used for statistical analysis.

Results

Table 1. **Sociodemographic data**

		Number (%) of respondents
Parent's gender	Male	15 (47)
	Female	17 (53)
Parent's age	20-25	3 (9)
	26-35	15 (47)
	36-45	11 (34)
	46-55	3 (9)
Parent's level of education	Elementary school	1 (3)
	High school	19 (54)
	Bachelor's degree	2 (6)
	Master's degree	10 (31)
	Doctor of Philosophy	0 (0)
Total	32 (100)	

The study included 32 respondents, among which 15 (47%) were male and 17 (53%) were female. Most respondents, 15 (47%), belonged to the age group of 26-35 years. When it comes to the level of education, most respondents, 19 (54%) of them, completed secondary education, while 10 (32%) respondents completed higher education (Table 1).

Table 2. **Data on child**

		Number (%) of respondents
Child's age	1-6 months	3 (9)
	6-12 months	3 (9)
	1-2 years	12 (38)
	2-3 years	4 (13)
	More than 3 years	10 (31)
Child's gender	Male	21 (66)
	Female	11 (34)
Number of febrile seizures	1	19 (59)
	2-3	12 (38)
	4-5	1 (3)
Total	32 (100)	

In relation to child's age, most children, 12 (38%), were in the age group of 1 to 2 years of age, while 10 (31%) children were older than 3 years. When it comes to gender, there were more male children, 21 (66%). Out of total of 32 children, 19 (59%) experienced febrile seizure once, and one child had 4-5 seizures (Table 2).

Table 3. **Parents' perception of febrile seizures in children (1st part)**

Question	Answer	Number (%) of respondents
Were you aware that your child was having a febrile seizure?	Yes	12 (38)
	No	20 (62)
If not, what did you think was happening?	I knew	13 (41)
	Allergic reaction	1 (3)
	Loss of consciousness	4 (13)
	Rise in body temperature	3 (9)
	Choking	3 (9)
	Dying	6 (19)
	Epileptic seizure	1 (3)
	Cessation of breathing	1 (3)
Which emotion was dominant in you during the febrile seizure?	Panic	13 (41)
	Fear	16 (50)
	Sadness	3 (9)
On a scale of 0 to 10, how would you asses that emotion?	5	1 (3)
	6	1 (3)
	7	4 (13)
	8	5 (16)
	9	4 (13)
	10	17 (53)
Who told you that your child had a febrile seizure?	Physician	25 (78)
	Nurse	4 (13)
	Nobody	1 (3)
	I don't remember	2 (6)
At what value do you start reducing your child's body temperature?	37.8 °C auricularly	3 (9)
	38 °C axillary	14 (44)
	38 °C auricularly	7 (22)
	38.5 °C axillary	4 (13)
	38.5 °C auricularly	3 (9)
	38.7 °C axillary	1 (3)
Total	32 (100)	

A total 20 (62%) respondents were not aware that their child was having a febrile seizure. During seizures, most respondents, 16 (50%), felt fear as the dominant emotion. A total of 17 (53%) respondents assessed the intensity of the emotion as 10 on the scale from 0 to 10. Most respondents, 14 (44%), of them began to reduce the body temperature when it was 38°C measured axillary (Table 3).

Table 4. **Parent's perception of (N=32) febrile seizures in children (2nd part)**

Actions taken in the care of the child during febrile seizure	Number (%) of respondents	
	Yes	No
I made the surrounding safe for the child.	32 (100)	0 (0)
I tried to restrain the child during seizure.	11 (34)	21 (66)
I applied anticonvulsant medication.	8 (25)	24 (75)
I called emergency medical services.	27 (84)	5 (16)
I applied an antipyretic to reduce body temperature.	19 (59)	13 (41)
I placed a hard object in the child's mouth.	2 (6)	30 (94)
I placed the child on the right or left side and directed the head towards the surface.	22 (69)	10 (31)
I placed the child on their back and tilted their head back.	2 (6)	30 (94)
I placed the child on a soft and safe surface.	26 (81)	6 (19)

Among the actions taken by the parents in caring for the child during febrile seizures, the statement "I made the surrounding safe for the child" stands out, to which all 32 (100%) respondents answered affirmatively (Table 4). In relation to gender, significantly more male respondents called emergency medical services ($\chi 2$ test=5.229; p=0.02).

Out of 32 respondents, 9 (28%) felt ready for recurrent febrile seizures. A total of 29 (91%) respondents believed that they need additional education, mostly in the form of oral and written instructions (Table 5).

Table 5. **The parents' perception of febrile seizures in children (3rd part)**

Question	Answer	Number (%) of respondents
Do you feel ready for recurrent febrile seizures?	Definitely yes	9 (28)
	Partially	11 (34)
	Definitely not	6 (19)
	I cannot judge whether I am ready or not	6 (19)
Do you consider you need additional information and education about febrile seizures?	I consider	29 (91)
	I don't consider	3 (9)
Written instructions (longer instructions)	Yes	18 (56)
	No	14 (44)
Brochures (short instructions)	Yes	25 (78)
	No	7 (22)
Oral instructions	Yes	21 (66)
	No	11 (34)
Online education	Yes	5 (16)
	No	27 (84)
Total	32 (100)	

Discussion

The study examined parents' perceptions of febrile seizures in children and their opinions on the need for additional education. The results indicated insufficient readiness of parents for recurrent febrile seizures. Most parents also believed they were not adequately educated about the management procedures to follow in the case of a recurring episode. A total of 32 parents participated in the study. Most respondents were between 26 and 35 years of age. When it comes to child's age, most children were between 1 and 2 years of age, while a few children were older than 3 years. The study by Gunawan et al. revealed that 29% of 63 children in the sample

experienced first febrile seizure between 6 and 12 months of age. The authors believe that the cause for the occurrence of febrile seizures during that period is child's brain which has not yet reached its full maturity (19). When it comes to gender, there were more male than female children in the aforementioned study. The fact that male children are more prone to febrile seizures is supported by other studies. In the study by Gunawan et al., there were 63% male children in the sample of 63 children. However, in the study conducted in Saudi Arabia there were 52 (59.8%) female children in the sample of 87 children, out of which 37% had more than one episode of febrile seizure (20). The findings of that study contradict those of this one and other studies.

Most parents were not aware that their child was having a febrile seizure. Six respondents believed that their child was in a life-threatening situation, four of them thought their child was losing consciousness, three believed their child's temperature was rising or that they were choking. Additionally, one respondent each considered it an allergic reaction, an epileptic seizure, or cessation of breathing. Half of the respondents felt fear as the dominant emotion, thirteen respondents felt panic, and three respondents felt sadness. Over half of the respondents assessed their emotions as highly expressive. In the study by Kanemura et al. in 2013, a total of 41% of parents stated that they were afraid because they thought their child would die during the seizure, while 29% of them believed that the child had serious difficulties (21). During a febrile seizure, the paralyzing fear experienced by most parents often hinders them from acting appropriately and administering timely first aid to the child. In this study, most respondents indicated that their child's febrile seizure was communicated to them by a physician. A significant proportion of respondents (44%) began reducing their child's body temperature only when it reached 38 °C or higher when measured axillary. In children who have already had febrile seizures, reducing body temperature should be initiated at axillary temperature of 37.5 ˚C, i.e., rectal or auricular temperature of 38 ˚C. The second part of the questionnaire consisted of yes/no question about actions taken during febrile seizure. The statement "I made the surrounding safe for the child" stands out for being answered affirmatively by all respondents. The statement "I placed the child on a soft and safe surface", was answered affirmatively by most respondents. Only eleven respondents answered affirmatively to the statement "I tried to restrain a child in spasm", which is a devastating finding. In the study conducted in 2020 by Sayed, all parents placed their child on a soft and safe surface. Most respondents (86.7%) noticed the symptoms and followed the duration of the seizure, and 93.3% of them did not try to restrain the child during the seizure (22). During a seizure, the child should be restrained, i.e., involuntary movements of the extremities should be prevented to avoid self-harm and mitigate the risk of injury to others in the immediate surrounding. Most respondents answered affirmatively to the statement "I called emergency medical services". Significantly more male respondents called emergency medical services. In conversation with parents during this study, it was found that mostly mothers were first to help the child, while fathers were the ones who called emergency medical services. In several studies, 100% of the respondents called for emergency medical services (22, 23). The statement "I put a hard object in child's mouth" is also noteworthy as it was answered negatively by all but two respondents. The results of the study conducted in Nigeria and Turkey indicate that 61.2% of parents would put a hand or a spoon in their child's mouth to prevent choking, while 39.3% of parents would put any hard object in their child's mouth (24, 25). The results of this study showed that only two respondents tried to put a hard object in the child's mouth during a seizure. The results of the study by Kanemura et al. showed that 3% of parents patted or hit the child's back or tried to remove a foreign body from the throat during a seizure because they suspected that the child was choking on something. As many as 9% of them tried to separate the child's clenched teeth, while 7.7% of the parents shook the child violently. Only 4% of parents completely undressed the child, and none attempted mouth-to-mouth resuscitation (21). According to the study by Elbilgahy in Egypt, mostly mothers (71%) gave mouth-to-mouth resuscitation, while in the study by Kayserili in Turkey, only 10.7% of mothers gave mouth-to-mouth resuscitation (26).

First aid for seizures includes providing a safe surrounding to avoid injury, calling emergency medical services, placing the child on the left or right side with the head facing the floor, removing excess clothing, especially around the neck, placing a soft pillow under the head, avoiding putting any objects in the oral cavity, applying anticonvulsant therapy, and monitor-

ing the duration of seizure. This study identified key moments in which parents did not respond effectively during a seizure. One was putting a hard object in the oral cavity during an attack, and the other, extremely important one, was not preventing self-harm of the child by restraining the body in a spasm.

The third part of the questionnaire examined parents' opinion on their readiness for a recurrent seizure and their need for additional information and education about febrile seizures. Among 32 respondents, nine felt ready for a recurrent seizure, eleven felt partially ready, and six respondents were not ready or could not assess their readiness. In a study by Westin et al. conducted in 2018, most parents of children with recurrent seizures reported that the experience from the first seizure, along with the information received from healthcare professionals, significantly enhanced their readiness and confidence in dealing with subsequent seizures (27). The results of this study indicated that most respondents felt much more confident after receiving information from healthcare professionals. Almost all respondents believed that they need additional education about febrile seizure, mostly in the form of oral and written instructions. Given that febrile seizures are very stressful events, it would be helpful if detailed information about them became part of anticipatory guidance provided by pediatricians and pediatric nurses to all new patients. Children with febrile seizures require a holistic approach and their nurses should possess specialized skills and knowledge required for their roles. Educating parents on home care for their child in the case of recurrent seizure is among the crucial responsibilities of nurses. Before the child's discharge from hospital, parents should receive information through both oral communication and informative written materials such as leaflets and brochures. These written materials will serve as a helpful reference, allowing them to review details provided verbally during the hospitalization once they had the opportunity to calm down and the initial shock subsided (28). Additionally, online instructional videos and educational resources about febrile seizures can be made available to enhance understanding. It is very important to offer parents the opportunity to compile a list of important contact numbers of professionals who can assist them at any moment. Healthcare professionals at the Department of Neuropediatric should continuously improve their knowledge and skills to deliver the utmost care to young patients and their parents.

The limitations of this study are that it was conducted in one institution, on a small number of respondents and in a short period. A worrisome fact is that so many children were hospitalized for febrile seizures in such a short period.

Conclusion

The results of the study show that parents are not sufficiently prepared for recurrent seizures. Also, most parents believe that they need additional education about recurrent seizures. There is no significant difference in parents' perception of febrile seizures in children in relation to their gender, except for the question of calling emergency medical services because significantly more male parents called emergency medical services. Most parents were in fear and not aware that their child was having a febrile seizure. All parents acted correctly by providing a safe surrounding for their child during seizure. This study can provide a basis for further research on the topic.

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PERCEPCIJA RODITELJA O FEBRILNIM KONVULZIJAMA U DJECE

Sažetak

Cilj. Ispitati percepciju roditelja djece oboljele od febrilnih konvulzija (FK) o postupcima tijekom napadaja FK-a, percepciju roditelja u odnosu na spol te mišljenje o potrebnoj dodatnoj edukaciji.

Metode. Presječno istraživanje provedeno je u Kliničkom bolničkom centru Osijek na Klinici za pedijatriju tijekom veljače i ožujka 2023. Ispitanici su bili 32 roditelja djece hospitalizirane zbog febrilnih konvulzija. Primijenjen je upitnik o percepciji roditelja o febrilnim konvulzijama.

Rezultati. Ispitano je 32 roditelja, od kojih su 15 (47 %) muškarci i 17 (53 %) žene. Ukupno 20 (62 %) roditelja nije bilo svjesno da im dijete ima napadaj FK-a te ih je šest (19 %) mislilo da im dijete umire, a četvero (13 %) ispitanika mislilo je da im dijete gubi svijest. Za vrijeme konvulzija čak 16 (50 %) ispitanika osjećalo je strah kao dominantnu emociju, a 13 (41 %) ispitanika osjećalo je paniku. Definitivno spremnima za ponovne napadaje FK-a osjeća se devet (28 %) roditelja, dok po šest (19 %) ispitanika navodi da definitivno nisu spremni ili da ne mogu procijeniti jesu li spremni. Ukupno 29 (91 %) ispitanika smatra da su im potrebne dodatne edukacije.

Zaključak. Roditelji većinom nisu svjesni da dijete ima napadaj FK-a te osjećaju strah i paniku, muškarci su znatno više puta pozvali hitnu medicinsku pomoć od žena. Roditelji nisu dovoljno spremni za idući napadaj te većina smatra da su im potrebne dodatne edukacije.

Ključne riječi: febrilne konvulzije, percepcija, roditelji

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Professional paper

Sociological Aspects of Nursing Identity Development

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Abstract

This article presents the development of nursing identity with a brief review of the situation in the Republic of Croatia. The focus is on the conceptual interpretation of identity and its impact on the formation of individual identity in the social context. The postulate of contribution is manifested in the presentation of different authors' perspectives on the concept of nursing identity, emphasizing the ambiguity of this term. Special emphasis is placed on the analysis of nursing identity development, exploring the influence of traditional and modern social frameworks. The historical evolutionary path of nursing and the way in which gender stereotypes limit its progress are presented. Additionally, key components of contemporary nursing are highlighted, emphasizing the importance of academic education, research and theoretical development within nursing. Finally, the current issues of nursing within the Republic of Croatia were addressed, emphasizing the need for inclusive and modern nursing based on academic knowledge and social engagement.

Introduction

The excessive frequency of using the term “identity” in everyday interaction has resulted in its vagueness and multiple meanings. Numerous authors have devoted themselves to understanding and defining identity, whereby Rade Kalanj (2010), according to Brubaker, emphasizes the complexity of the term “identity”, marking it as a term which is too ambiguous, oscillating between solid and fragile meanings, essentialist and constructionist nuances (1).

In the same tone, Kalanj (2010), according to Castells, emphasizes:

> “Identity, regardless of changes in life-historical circumstances, is always what ‘I’ or ‘we’ think about ourselves or others and what others think about us, and to that extent it is a fundamental, indeed, a primordial category of human experience, so primordial that it would not be an exaggeration to characterize it as an identity ontology. It has its strength regardless of our will or contestation, and therefore it is no coincidence that some authors thematize it as “the power of identity” (1).

This view emphasizes the key role of identity in the formation of human experience and points to its undeniable importance despite the changes and challenges of life.

The development of an individual’s identity is a complex process which includes social and cultural aspects, such as racial, professional and gender identity. These identities often derive from others’ assumptions about us, shaping our perception of ourselves. Through the process of socialization, the individual builds their identity as part of the social whole (2).

Nursing, as a profession which has evolved since the 19th century, acquired an autonomous status only in the 1960s, after long-term efforts aimed at shaping its own identity. During the 1980s, nursing proactively incorporated nursing practices, moving toward qualitative methods in the humanities. The path from a controversial and marginalized profession to complete social and professional affirmation was a challenging process. Emphasis should be placed on the fact that today nursing is unavoidable and necessary for modern society and is an integral part of the healthcare system (3).

The identity of nursing

The turning point in attempts to define the identity of nursing rests in the 20th century, when the sense, meaning and values of nursing began to be strengthened in the academic environment, which represents a stronghold for the formation of unique knowledge and skills necessary for the development of a professional identity. In other words, the art of nursing encompasses the care about the sick as well as the care about the healthy, and in recent decades, special attention has been paid to building the identity of nursing, which would contribute to the development of theories and research in nursing (3).

Furthermore, the nursing profession has its own history, which makes it much more difficult to build a professional identity precisely because of the knowledge that no education was necessary to perform nursing work, and women of lower social status and without education were the ones who practiced nursing. However, an individual’s perception of themselves in a professional role affects professional development, but also the promotion of their own profession, and the acquisition of characteristics, values and experience of nurses is important for developing the attractiveness of the profession, especially for younger generations who have not yet formed an opinion about the identity of a particular profession (4).

In recent years, the vision of the development of the nursing profession has been expanding in order to improve the health culture of the entire population. Considering that nurses represent patients and their families in the social community, their well-being is based on the construction of social determinants of health in the provision of quality healthcare (5).

The identity of nursing in pre-modern society

The development of nursing throughout history reflects the evolution of the assumptions which shaped its concept. According to Virginia Henderson, healthcare is the core area of nursing, encompassing the care of the healthy and sick individuals who need help. Nursing is described as the art of providing healthcare, while emphasizing its vocational character, and is recognized as a profession (6).

By studying the history of nursing, we can identify key periods which shaped the role and significance of nurses. In the pre-modern period, caring for the

sick was predominantly the responsibility of female members of the family or community, who were using techniques and plants with positive effects. In ancient cultures such as Egypt, Babylon and China, we find records of nurses in religious books. The Christian period saw the involvement of matrons and deaconesses in caring for the sick, encouraging education and laying the foundations for the development of educated nurses. The Renaissance brought an accelerated development of medicine, but the perception of nursing as a "religious" vocation stagnated. In the "dark" 16th century, nursing became undesirable due to low wages and harsh conditions. Changes began with St. Vincent de Paul in the 16th century and Thomas Fliedner and Florence Nightingale in the 19th century (7).

Florence Nightingale, the founder of nursing, is a symbol of hope and compassion. She devoted her life's calling to serving God and developing discipline in caring for the sick, laying the foundations of modern nursing. Her work during the Crimean War emphasized the importance of nurse education, and her greatest contribution is considered to be the introduction of the administrative role of the nurse (8).

The traditional portrayal of nurses has often depicted them as oppressed and marginalized by doctors, resulting in low self-esteem on a personal and professional level. These stereotypes, together with the determinants of working conditions, shared values and level of education, shaped the development of nurses' professional identity (9).

Gender stereotypes, which consider women to be biological and rational, are also reflected in the nursing profession. A historical review of various cultures attributes the reproductive role to the concept of woman, which is associated with care and concern for the family and the home. The assigned roles limit women and favor the discrimination of social values. Nursing has always been in collision with the variables of gender which are manifested by the gap between men and women through the assigned roles in nursing. In the same way, the mentioned stereotypes affect the nurses' perception of themselves, which are focused on the social representation of the nursing profession. At the end of the 20th and beginning of the 21st century, the nursing profession was not promoted, but public perception had negative connotations, which was also influenced by the media, which "perpetuated stereotypes about the nurse as an angel of mercy, a doctor's maid and a sexy nurse or sexual object" (10) and the nurse became invisible to society (10).

The development of nursing education lays the foundations of modern nursing, setting high standards and ethical principles. In the 20th century, morality and virtue became key criteria for admission to nursing schools (7). This continuous process of evolution is reflected in the contemporary understanding and professional identity of nurses.

The identity of nursing in modern society

Modern society implies the synergy of history and society through elements of nature which are constantly evolving. The shaping of society is intertwined with science and the development of practical skills, which is manifested through the work of the individual (11).

Professional work influences the construction of identity based on the characteristics which shape a profession, among which the following stand out: "its historical constitution, special occupational culture, specific knowledge and specific dialect" (12). The parameters which make a profession "professional" are recognition of the status by the state, educational and public institutions and in defining the criteria necessary for its training (12).

Within nursing, the fundamental goal is to define the key elements of constructing a professional identity, and the following are stated: "values and ethics, knowledge, nurse as a leader and professional behavior" (13), the implementation of which would benefit both nurses and patients. The mentioned elements are necessary in describing and bringing nursing closer to students, other nurses and society in general. Also, these elements can be used to further analyze the current situation and improve one's own areas for progress (13).

Modern society realizes its arbitrariness through work and becomes useful for society as a whole, and highlighting the importance of science and art is a feature of sophistication that embodies greater freedom and humanity (11).

Sociological research on the qualities needed in building the profession culminated between the 1950s and 1980s, a period in which leading nursing officials sought guidance in the establishment of nursing. A university professor of sociology, Dr. Merton, helped

the nursing association understand the demands of the profession, which he described as: "an organization of practitioners who judge each other as professionally competent and who have joined together to perform social functions that they cannot perform separately as individuals" (14).

The development of the professionalization of nurses is much discussed at the global level, but only the development of nursing guidelines and protocols has confirmed that nurses possess immense knowledge and skills, although the real core of nursing is still unclear. The goal of nursing should be focused on the development of theories, research and skills so that the society recognizes the empirical and specialist development of nursing and its contribution to society (9).

On that track, the foundations and characteristics of the nursing profession were laid, which became the area of interest and the establishment of professional associations of nurses. The basic premise of the further development of nursing has become global networking and the availability of information related to the discipline of nursing (14).

In recent years, social changes caused by the occurrence of events such as the COVID-19 pandemic and the declaration by the WHO of 2020 as the Year of Nurses and Midwives, as well as the development of various possibilities for the transmission of information sources, and the development of communication channels and social networks have improved the visibility of the nursing profession. The influence of the mentioned events reduced gender stereotypes in nursing and improved the knowledge and attractiveness of the nursing profession (10).

Nurses continue to develop their professional identity by maintaining relationships with other nurses, promoting lifelong education, information exchange and developing common values in order to visualize the professional identity of nurses in the right way (15). Dynamism and flexibility are the most important concepts in improving the provision of health care (16).

Dynamics of nursing identity in a modern (postmodern) context

Étienne Wenger, a well-known theorist, believes that identity "...is to be lived, which means that identity is the core of human existence and is fundamentally an experience which involves participation and reification" (17). He defines identity as the intersection between the individual and the collective. Wenger points out that creating one's own idea about the profession can be crucial for establishing a professional identity within the community (17).

Changes in the way and provision of modern nursing care are conditioned by the integration of new health reforms and the use of different technologies in work, which changes the role and expectations of nurses, requiring rapid adaptation with the aim of achieving fluidity in work (16). Despite the fact that nursing is associated with the qualities of self-sacrifice, honesty and moral integrity, the development of professional identity is associated with personal identity, which includes emotional and behavioral determinants in the process of self-acceptance and self-identification with the profession (17).

The development of a professional identity in nursing is deeply rooted in personal values, attitudes and beliefs, and all of this is immersed in the context of the characteristics and deep understanding of the nursing profession. A key phase of professional identity formation begins during undergraduate nursing education, where theory and practice align to shape a basic understanding of the role of the nurse. The initial steps in the formation of a professional identity are experienced through the prism of theoretical concepts and their concrete application in the clinical environment. Novice nurses actively adapt and refine their professional identity as they gradually integrate into the workforce. The adaptation process is not just a one-time event, but a continuous series of adaptations based on newly acquired knowledge, developed skills, assumed roles, assigned responsibilities and changes in work environments. Through the accumulation of personal and professional experiences, nurses build their professional identity, resulting in a dynamic and adaptive process of evolution. This dynamism enables adaptation to new standards of practice, technological innovations, ethical norms and contemporary challenges in the healthcare system. Professional identity becomes a kind of permanent version which reflects the constant effort of nurses to improve their own expertise (16).

Moreover, the development of the nursing profession is affected by the increased turnover and shortage of nurses due to the possibility of choice in seeking to achieve self-realization, a sense of belonging to an organization and satisfaction in work (17).

Migration of nurses is becoming a social problem motivated by the desire to improve the standard of living and working conditions, as well as the possibility of advancement in the profession (18).

The decision to stay in a profession or organization is often associated with a sense of empathy towards oneself and patients, a key factor in the growth and development of nursing, and attracting new generations of nurses to the profession (17).

The global migration of health professionals poses a number of moral, legal and political challenges that need to be addressed through additional initiatives aimed at developing strategies to retain qualified professionals (19).

Therefore, the continuous progressive development of the nurses' professional identity not only promotes their personal growth, but also plays a key role in providing high-quality healthcare. This evolutionary process supports a deep understanding and commitment to the profession, creating a foundation for excellence in nursing practice and contributing to the quality of the healthcare system (16).

Challenges of nursing identity development in the Republic of Croatia

In the past decades, we have witnessed significant progress in the development of nursing in the Republic of Croatia. A key step towards the professionalization of nursing was achieved through the establishment of regulations through legislation, especially the adoption of the Act on Nursing. This law precisely defines the competencies of nurses, marking a turning point in the regulation of the profession and providing clear guidelines for the performance of their tasks.

Despite the achievements, we face nursing challenges in the Republic of Croatia, aligned with global trends. Lack of nurses and difficult working conditions are key problems. Research by the authors Kurtović, Friganović, Čukljek, Vidmanić, Stievano (2021) emphasizes the need for urgent measures to solve the issue of staff shortages and improve the working environment of the profession (20).

Through the development of the identity of nursing, especially through strengthening the reputation of nurses by encouraging self-determination and self-confidence, the research lays the foundations for the further development of the profession (20).

This approach represents a key element in the development of modern nursing in the Republic of Croatia with an emphasis on adequate management of complex health interventions, including the application of advanced technology and effective disease management. In accordance with modern standards of nursing practice, the main role of nurses is to identify and meet the specific needs of patients, develop comprehensive nursing care plans and evaluate the outcome of interventions within the framework of primary, secondary and tertiary healthcare (20).

Given the evolution of the healthcare sector, nurses today are taking on additional responsibilities, requiring a diverse set of skills. Education is focused on raising the expertise of nursing staff to facilitate the provision of patient-centered care. Integration of patients into interdisciplinary teams, evidence-based practice, continuous improvement of the quality of care and optimal use of health information technology are becoming key elements of modern nursing (20).

This comprehensive approach not only promotes the expertise of the nursing staff, but also supports further progress in the provision of high-quality healthcare in the Republic of Croatia.

Conclusion

Through studying the development of the identity of nursing throughout history, we observe the complexity and dynamics that shaped this profession. The excessive use of the term "identity" in today's everyday interaction points to the challenges we face when defining this complex category. The identity of nursing, like any other identity, arises from the interplay of individual and collective experience.

In pre-modern society, nursing evolved from the tradition of caring for the sick, and the identity of nurses was shaped through religious and social norms. Female gender stereotypes and low social status created challenges for the development of nurses' professional identity. Throughout history, nursing has gone through phases from marginalization to affirmation, with challenges such as lack of education and low self-esteem, leaving their mark on the profession's identity.

In modern society, the professionalization of nursing brings a new context in the formation of identity. Respect for the state, educational institutions and the public is essential for the recognition of the status of nurses as professionals. The development of knowledge, ethical values and management in accordance with the changes in the healthcare system contribute to the formation of the modern identity of nursing.

Ultimately, nursing identity is a complex entity which has evolved throughout history, adapting to social changes and reflecting various challenges. Modern nursing requires flexibility, expertise and the promotion of autonomy in order to respond to the demands of a complex healthcare system. Improving the professional identity of nurses is essential for achieving high standards of care and preserving the vital role of nursing in society.

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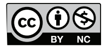
SOCIOLOŠKI ASPEKTI RAZVOJA IDENTITETA SESTRINSTVA

Sažetak

U radu je prikazan razvoj identiteta sestrinstva s kratkim osvrtom na stanje u Republici Hrvatskoj. Fokus je stavljen na konceptualnu interpretaciju identiteta te njegov utjecaj na formiranje individualnog identiteta u društvenom kontekstu. Doprinos se manifestira u prikazu različitih autorskih perspektiva na koncept identiteta sestrinstva, naglašavajući višeznačnost tog pojma. Poseban naglasak stavljen je na analizu razvoja identiteta sestrinstva, istražujući utjecaj tradicionalnih i modernih društvenih okvira. Prikazan je povijesni put sestrinstva te način na koji rodni stereotipi ograničavaju njegov napredak. Dodatno, istaknute su ključne komponente suvremenog sestrinstva, naglašavajući važnost akademskog obrazovanja, istraživanja i teorijskog razvoja unutar sestrinstva. Na kraju, obrađena je aktualna problematika sestrinstva unutar Republike Hrvatske, naglašavajući potrebu za inkluzivnim i suvremenim sestrinstvom temeljenim na akademskom znanju i društvenom angažmanu.

Ključne riječi: sestrinstvo, identitet, profesija, skrb, autonomija



Factors Related to Effective Teamwork Performance in Nursing: Narrative Literature Review

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Keywords: teamwork, effective teamwork, nursing, factors

Abstract

Introduction. The importance of teamwork in nursing has gained an increased attention in recent years due to the complexity of the healthcare delivery system, and a shortage of nurses, which has resulted in increased workloads which may result in work errors, thus impacting patient, nurse, and organizational outcomes. Effective nursing teamwork is vital for the provision of high-quality healthcare.

Aim. This review examines current research on teamwork in nursing with a focus on factors related to effective teamwork performance.

Methods. A narrative review of articles regarding the factors which influence effective teamwork in nursing was carried out between December 2023 and January 2024. An electronic search of the PubMed database was applied to select relevant articles using the keywords *teamwork among nurses, effective teamwork, and nursing*.

Results. The online search resulted in 854 articles. Twenty-one articles were then selected for a full-text review. Five articles met the inclusion criteria. Factors related to effective teamwork performance in different domains have been identified and described in the present research. Those factors are: trust among team members, team motivation, effective working environment, effective communication, effective team management, education about teamwork, measurement of teamwork, knowledge sharing among team members, and interventions for enhancing nurses' teamwork.

Conclusion. It has been proven that effective teamwork is key to ensuring quality of care, better healthcare outcomes, and patient and healthcare worker safety. Therefore, facilitating and supporting effective teamwork should be one of the priorities of healthcare organizations. To achieve this, it is necessary to take into ccount the factors related to effective teamwork performance. The emphasis should be on strengthening the effective teamwork of nurses for the benefit of quality patient care.

Introduction

The nursing workforce is the largest group of professionals in healthcare worldwide (1). According to the International Council of Nurses, "Nursing encompasses autonomous and collaborative care of individuals of all ages, families, groups and communities, sick or well and in all settings" (2). Today, modern healthcare is complex and rapidly changing and it is therefore important for nursing staff to work together as a team to secure quality of care (3). A nursing team is defined by authors Kalisch, Weaver, and Salas (2009) as "two or more members of nursing staff who work together to provide care and administrative tasks for a group of patients" (4). The importance of nurses' teamwork in healthcare has gained increased attention in recent years due to the complexity of the healthcare delivery system, and a shortage of nurses, which has increased workloads which may result in work errors, thus impacting patient, nurse, and organizational outcomes (5). The literature states that teamwork plays a crucial role in addressing the shortage of nurses (3). Organizations such as the World Health Organization and the Institute of Medicine have identified teamwork and team-based care as the key contributors to patient safety (3). Recent evidence from the literature stated that the nursing care team plays a pivotal role in patient and staff outcomes and proficient teamwork is identified as one of the premises of a healthy work environment in nursing (3). Effective teams are those in which both leaders and members make a conscious effort to unify a group of people into a well-functioning work unit (6). Thus, effective teamwork has a positive effect on job satisfaction, staffing efficiencies, retention, and care delivery (7). It supports the optimal use of the knowledge and skills of nurses and their co-workers and reflects an individual's sense of belonging to a team and their willingness to work in a team (8). It has been identified as one of the cornerstones of nursing education. Evidence from the literature stated that having a supportive and trustworthy nursing team is a key factor in fostering effective teamwork and that healthcare organizations should recognize the value of teamwork and emphasize approaches which maintain and improve teamwork for the benefit of their patients (8,9). Therefore, understanding which factors foster effective teamwork ensures teamwork qualities (10,11).

Aim

This review examines current research on teamwork in nursing with a focus on factors related to effective teamwork performance.

Methods

A narrative review of articles regarding the factors influencing effective teamwork in nursing was carried out.

Inclusion and exclusion criteria

We included full-text articles which focused on factors contributing to effective teamwork performance in nursing. Studies conducted only among nurses were included. The inclusion criteria were also the articles written in the English language. There were no restrictions regarding the publication date.

Exclusion criteria were studies without analysis of teamwork-related factors or studies not written in English. Studies conducted among other healthcare professionals were excluded. Articles not available in full-text (i.e. title or abstracts only) were excluded.

Search strategy

A literature search was carried out between December 2023 and January 2024. An electronic search of the PubMed database was applied to select relevant articles using the keywords teamwork among nurses, effective teamwork, and nursing. Two reviewers independently screened titles and abstracts from articles yielded in the search. Afterward, full texts of all relevant articles were obtained and screened by the same two reviewers. Full-text articles were retrieved when both reviewers agreed that inclusion criteria were met.

Results

The online search resulted in 854 articles. Twenty-one articles were then selected for a full-text review. Five articles met the inclusion criteria. Table 1 describes the selected articles.

Factors related to effective teamwork performance in different domains have been identified and described in the present research. Those factors are: trust among team members, team motivation, effective working environment, effective communication, effective team management, education about teamwork, measurement of teamwork, knowledge sharing among team members, and interventions for enhancing nurses' teamwork (Table 1).

Discussion

Effective nursing teamwork is vital for the provision of high-quality healthcare (16). The current study's findings suggest the following factors which are related to effective teamwork performance: trust among team members, team motivation, effective working environment, effective communication, effective team management, education about teamwork, measurement of teamwork, knowledge sharing among team members, and interventions for enhancing nurses' teamwork.

Trust among team members

A trusting atmosphere in nursing teamwork can enhance job satisfaction, productivity of the employees, organizational commitment, cooperation, and effective communication. Trust is a positive expectation resulting from roles, relationships, experiences, and interdependence with others (13). A study which investigated the impact of organizational justice, trust, and identification and their impact on nurses gave us positive examples from practice. The results of the study showed that the maximization of organizational justice, trust, and identification by hospital managers positively changes the attitude of nurses toward work, but also improves the quality of work. Nurses were motivated to provide feedback to the attention and care provided by the hospital management, facilitating teamwork among colleagues, boosting the morale of the nursing faculty, and reducing resignations and career changes. Trust in the team also affects the members' satisfaction with the team (17). Evidence from the literature stated that when team members feel valued, it will help them overcome their fear associated with taking interpersonal risks, making them feel safe to speak openly and overall to engage in their work. Feeling trusted by the team leader facilitates a sense of psychological safety, but their absence can cause team members to relapse to natural behavior patterns (18).

Team motivation

Motivation is an extremely relevant factor which affects the quality and content of work outcomes in healthcare (19). In general, motivation can be extrinsic or intrinsic. The quality and quantity of work is better when employees are highly motivated. The ability to motivate employees to not only meet their individual goals, but also achieve organizational goals is an important leadership skill. Team members do not have to be motivated only by money and rewards, but it would be good if they are highly intrinsically motivated and if their motives are in line with the motives of the organization (20). These individuals tend to perform well without the need for constant supervision and can even motivate other employees to work harder.

Table 1. **Overview of the studies finally included**

Authors/year of publication	Findings about factors influencing effective teamwork in nursing	Recommendations
Baek H, Han K, Cho H, Ju J. (2023) (12)	• education about teamwork from the undergraduate level • interventions for enhancing nurses' teamwork	Enhancing nurses' teamwork can serve as an effective strategy for promoting patient-centered care. Education through awareness and knowledge starting from the undergraduate level (e.g., TeamSTEPPS) will provide basic skills for better teamwork, as well as organizational training such as virtual simulation and train-the-trainer interventions aimed at improving teamwork skills (12).
Chen SY, Wu WC, Chang CS, Lin CT, Kung JY, Weng HC, Lin YT, Lee SI. (2015) (13)	• implementation measures to increase the trust among employees	Organizations must actively seek an improved understanding of trust and must implement measures to increase the trust of their employees (13).
Farley, MJ (1991) (14)	• team members must be valued, supported, and trusted • communication among team members must be open and honest • team goals must be clear • effective team management • effective working environment • team norms must enhance • team roles must be assumed appropriately • motivation of team members • evaluation of the team effectiveness	Development of a team does not take place automatically and inevitably. It is a result of the efforts of the team leader and the team members (14).
Anselmann V, Brouwer J, Mulder RH. (2023) (8)	• the accomplishment of individual learning activities • knowledge sharing	In order to improve team performance, team leaders and managers in nursing need to foster the engagement of both individual and team learning activities by providing opportunities for these activities. Team leaders should pay attention to team members' work preferences, psychological empowerment, and the team's overall boundedness (8).
Mabona JF, van Rooyen D, Ten Ham-Baloyi W. (2022) (15)	• collaborative leadership • good communication • effective team management • establishing trust among team members	Nurse leaders play a significant role in facilitating effective or authentic leadership through effective communication, Also, nurse leaders play a significant role in enhancing teamwork by staying in tune with the needs of the team, as well as promoting autonomy of nurses in their team, establishing trust between team members (15).

Effective working environment

A healthy nurse work environment is a workplace which is satisfying, safe, and empowering (21). The results of previous studies demonstrated that a supportive environment for the nurses, motivation from the management, opportunities for professional development, education about communication skills and ways of improving professional relationships and resolving conflict, as well as smaller unit sizes, are all ways to improve nurses' working environment (22, 23). Likewise, a good organization of the work environment contributes to job satisfaction and better patient care (23).

Effective communication

Successful teamwork is essential in high-risk environments such as hospitals. Communication, along with effective teamwork, is necessary to achieve patient safety (14). Patient care is entrusted to different professions, so communication failures are almost inevitable. There are different communication styles used by different members of the team, which can occasionally lead to communication failures. In order to improve collaboration in a team, it is necessary to improve communication. Evidence from the literature states that in order to achieve effective teamwork, communication among team members must be open and honest (14). The findings from previous studies have shown that education is the key to improving team communication (24).

Effective team management

The ability of team leaders to develop others' trust in them is critical to leadership effectiveness. An experienced leader has to know the qualities and performances of their team members to encourage certain team members to achieve the best work outcome and, ultimately, better outcomes for the patient. The leader contributes to trust and security among team members by good examples of managing crises which is necessary for a sense of community. The findings from the previous studies have shown that emotional intelligence has made a significant contribution to effective leadership, becoming one of the key characteristics of leaders. It is important for achieving effective leadership in healthcare organizations and it contributes decisively to their good functioning and successful operation (15). As regards nurses, at every level, the above need is considered imperative because of the particular nature of the nursing profession, which places the healthy or weak person at its center. By implementing social and emotional learning programs, nurses can acquire knowledge, attitudes, and skills which are necessary for understanding and managing emotions, achieving positive goals, and maintaining positive relations and accountable decisions (25).

Education about teamwork

The findings from the previous studies have shown that education changes the culture, improves communication, increases professional understanding, and emphasizes the need to use effective communication strategies and team-building techniques during the formative period of professional learning (12, 14). Education through Team Strategies and Tools to Enhance Performance and Patient Safety program (TeamSTEPPS program), which is an evidenced-based communication-training toolkit created with the purpose of improving teamwork and communication, as well as various organizational trainings such as virtual simulation and train-the-trainer interventions aimed at improving teamwork skills are important for the acquisition of knowledge and skills for effective teamwork (12). Gillespie et al. (2010) suggested that education about teamwork should be included in the curriculum of undergraduate studies in medicine and nursing (26). van Diggele et al. (2020) suggested that effective team management is a complex and highly valued component of health education, increasingly recognized as essential to the delivery of high standards of education, research, and clinical practice. In order to meet the healthcare needs of the twenty-first century, competent leaders will be increasingly important in all healthcare professions. Consequently, the inclusion of leadership training and development should be part of all healthcare professionals' curricula (27). Thus, it is critical to recognize that nurse leaders not only have the role and responsibility of leading teams, but they also must see to it that nursing staff receive the education and training needed for practicing effective teamwork (3).

Measurement of teamwork

The importance of teamwork measurement has grown significantly over the last few years. When researching the tools used to measure teamwork in nursing, we found Hackman's model of team effectiveness, Salas's "Big Five", Nursing teamwork survey (NTS). The Nursing Teamwork Survey measures overall teamwork and five factors of teamwork: trust, team orientation, backup, shared mental models, and team leadership (28). Different authors used the NTS survey where they showed that effective teamwork does not only improve efficiency but tends to lead to a healthier and happier workplace (29). Also, a higher level of teamwork and adequate staffing tends to lead to greater job satisfaction with current position and occupation, resulting in better patient care (30). According to Costello et al. (2021), introducing team-building strategies and acting on the results of NTS may provide effective support to help improve communication and teamwork which will ultimately improve the quality of nursing care and patient outcomes (29).

Knowledge sharing among team members

When it comes to nursing, learning, and knowledge are some of the most important aspects of good teamwork criteria. According to Anselmann et al. (2023), team learning activities, such as reflection and knowledge sharing, are cognitive intergroup processes which influence cognitive structures and thought patterns, affecting behavior (8). Also, knowledge sharing results in team members' creativity (31). Evidence from the literature on the importance of knowledge sharing shows that informal learning and individual learning activities do not show equally good results as knowledge sharing between team members. Having that in mind, one can't go without the other, therefore individual, informal, and team learning contribute to the aspects of knowledge sharing, hence, to team effectiveness (8).

Interventions for enhancing nurses' teamwork

Evidence from the literature stated that in healthcare settings, teams have become necessary to ensure effective functioning within organizations (32) and interventions which improve teamwork improve clinical outcomes (33). The results of previous studies emphasize several types of interventions such as individual-focused, structural or organizational, and combined interventions. Interventions focused on individuals encompass self-care workshops, stress management skill development, and communication skills training. Additional practices like yoga, massage, mindfulness, and meditation may be incorporated. Structural or organizational interventions involve workload or schedule rotation, stress management training programs delivered in group face-to-face sessions, teamwork/transitions, and the implementation of focus groups. Combined individual-focused and structural interventions include stress management and resilience training, stress management workshops, and improving interaction with colleagues through personal training. Training and follow-up are carried out face-to-face, by phone, e-mail, video, or online (34). Hughes et al. (2016) indicated that healthcare team training is effective because it surpasses employees' pretraining utility, induces learning, transfers learned material to the job, and leads to improved organizational and patient results (32). According to Buljac-Samardzic (2020), key interventions for team improvement are training (principle-based, method-based, and general), tools (such as SBAR and (de)briefing checklists), organizational (re)design, and programs. Crew resource management (CRM) training incorporates information, demonstration, and practice-based methods. Also, TeamSTEPPS emphasizes competencies and standardized tools across teamwork domains. Simulation-based training enhances real patient experiences. Briefings and debriefings enable systematic communication, while organizational (re)design targets structural enhancements. Programs are organized in a manner which integrates learning sessions, simulation training, and structural interventions (35). According to Weaver et al. (2010), simulation and classroom-based team-training interventions can improve teamwork processes (e.g., communication, coordination, and cooperation), and implementation has been associated with improvements in patient safety outcomes (36).

Conclusion

Teamwork has always been important in nursing. It has been proven that effective teamwork is key to ensuring quality of care, better healthcare outcomes, and patient and health care worker safety. Therefore, facilitating and supporting effective teamwork should be one of the priorities of healthcare organizations. In order to achieve that, it is necessary to take into account the factors related to effective teamwork performance. The emphasis should be on strengthening the effective teamwork of nurses for the benefit of quality patient care and the creation of a healthy working environment, and therefore greater teamwork cohesion. The present research is intended for all nurses, at all levels of health care, to apply the mentioned factors in their daily work environment and thereby increase the functionality and management of the team.

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FAKTORI POVEZANI S UČINKOVITIM TIMSKIM RADOM U SESTRINSTVU: NARATIVNI PREGLED LITERATURE

Sažetak

Uvod. Važnost timskog rada u sestrinstvu posljednjih je godina privukla sve veću pozornost zbog složenosti sustava pružanja zdravstvene njege i nedostatka medicinskih sestara, što je povećalo opterećenje posla koje može rezultirati pogreškama u radu, što utječe na pacijenta, medicinsku sestru i organizacijske rezultate. Učinkovit timski rad medicinskih sestara ključan je za pružanje visokokvalitetne zdravstvene skrbi.

Cilj. Ovaj rad ispituje aktualna istraživanja o timskom radu u sestrinstvu s fokusom na čimbenike koji se odnose na učinkovit timski rad.

Metode. Narativni pregled objavljenih radova o čimbenicima koji utječu na učinkovit timski rad u sestrinstvu proveden je od prosinca 2023. do siječnja 2024. Elektroničkom pretragom baze podataka PubMed odabrani su relevantni radovi s pomoću ključnih riječi timski rad među medicinskim sestrama, učinkovit timski rad, sestrinstvo.

Rezultati. Online pretragom pronađena su 854 članka. Zatim je odabran 21 članak za cjeloviti pregled teksta. Pet članaka zadovoljilo je kriterije za uključivanje u rad. Faktori koji se odnose na učinkovit timski rad u različitim domenama identificirani su i opisani u ovom istraživanju. Ti su faktori: povjerenje među članovima tima, motivacija tima, učinkovito radno okruženje, učinkovita komunikacija, učinkovito upravljanje timom, edukacija o timskom radu, mjerenje timskog rada, dijeljenje znanja među članovima tima i intervencije za poboljšanje timskog rada medicinskih sestara/tehničara.

Zaključak. Dokazano je da je učinkovit timski rad ključan za osiguranje kvalitetne skrbi, boljih ishoda te sigurnosti pacijenata i zdravstvenih djelatnika. Stoga bi omogućavanje i podržavanje učinkovita timskog rada trebao biti jedan od prioriteta zdravstvenih organizacija. Kako bi se to postiglo, potrebno je uzeti u obzir čimbenike koji se odnose na učinkoviti timski rad. Naglasak bi trebao biti na jačanju učinkovita timskog rada medicinskih sestara/tehničara za dobrobit kvalitetne skrbi za pacijenta.

Ključne riječi: timski rad, učinkovit timski rad, sestrinstvo, faktori

Do Croatian Parents of Children with Cancer Use Religious Coping?

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Cancer is a leading cause of death worldwide, accounting for nearly 10 million deaths in 2020, or nearly one in six deaths (1). In Croatia, cancer incidence was 565 per 100,000 inhabitants in 2020, and cancer mortality was 311 per 100,000 inhabitants in 2019. Childhood cancer (among children aged 0-14) has an estimated age-standardized rate of 17.5 new cases per 100,000 inhabitants in Croatia. This is the fourth highest rate in the European Union, and it is 13% higher than the European Union average (2). In 2020, the number of annual childhood cancer cases was 97, with the most common (22 cases) of acute lymphoid leukemia (3).

Cancer is a traumatic experience for both patients and their families. Anxiety and depression are the most common psychological symptoms in patients with cancer, irrespective of the stage of the disease, primary cancer site and phase of treatment. Symptoms may range from nonpathological states, such as concerns, worry, sense of uncertainty, sadness and increased levels of hopelessness, to specific psychiatric syndromes (i.e. anxiety and depressive disorders) (4).

Coping is defined as the thoughts and behaviors mobilized to manage internal and external stressful situations (5). Religion, a divine law established by God, is advice and sincerity (6). Religion has had significant effects on mental health directing and modeling social behavior, explanatory styles and world-views which promotes well-being at both individual and community level. “Sound mind in a sound body on sound society and sound religion” (7). Religious coping is a means of seeking God’s help, trusting and taking refuge in God, finding solace in religious provisions/teachings, and

praying/worshiping more than usual during stressful events of life, such as illness, calamity, death, or circumstances in which a person is helpless (8). Although a few studies on the religious coping strategies of Croatian adult cancer patients have been reported in the literature, to the best of our knowledge, there were no studies on the religious coping styles of parents of children with cancer in Croatia. In this work, we discussed the use of religious coping among parents of children with cancer to draw attention to the importance of religion, spirituality, and religious coping in parents of children with cancer.

Religion serves a variety of purposes in day-to-day life and in crisis. Pargament et al. (9) identified five key religious functions as follows: "to search for meaning", "to achieve a sense of mastery and control", "to reduce the individual's apprehension, and to desire to connect with a force that goes beyond the individual", "to foster social solidarity and social identity" and "to assist people in making major life transformations". Pargament et al. (10) also identified positive and negative patterns of religious coping methods as follows: the positive pattern consisted of religious forgiveness, seeking spiritual support, collaborative religious coping, spiritual connection, religious purification, and benevolent religious reappraisal. The negative pattern was defined by spiritual discontent, punishing God reappraisals, interpersonal religious discontent, demonic reappraisal, and reappraisal of God's powers. People make more use of the positive than the negative religious coping methods (10).

Parents of children with serious illness report that religion and spirituality are important coping resources (11). Compared to nationally reported data for adults, parents of children with cancer reported high scores for psychological distress, but similar levels of religiosity, religious coping, and resiliency. Negative religious coping (feelings of negativity related to the Divine) was associated with higher levels of psychological distress. That effect was most prominent in parents who reported the highest levels of religiosity. Positive religious coping, religiosity, and social support were not associated with levels of psychological distress (11). Recently, Deribe et al. (12) have reported that sources of stress related to child's health condition, such as the severity of the child's illness, fear of treatment side effects and loss of body parts were identified. Parents mentioned experiencing stress arising from limited access to health facilities, long waiting times, prolonged hospital stays, lack of chemotherapy drugs, and limited or inadequate information about their child's disease condition and treatment. Coping strategies used by parents were religious practices including prayer, crying, accepting the child's condition, denial and communication with health providers (12). Ochoa-Dominguez et al. (13) noted that about one half of the Hispanic parents shared how their religious practice helped them emotionally deal with their child's cancer diagnosis. That usually involved the mention of God or a higher being and practices, and religious beliefs centered on accepting the illness and redirecting their attention to God to save their child. Through their faith and belief in God, the participants were able to regulate their emotions and stay calm as their child went through cancer treatment, and believed that their child would not relapse (13).

A few studies on the religious coping strategies of Croatian adult cancer patients have been reported in the literature. Kvesic et al. (14) reported that a lower level of religiosity was correlated with a higher severity of psychic symptoms in oncology patients. Less satisfaction with physical health was negatively associated with stronger mental symptoms and higher levels of intrinsic religiosity (14). Croatian patients diagnosed with alcohol dependence and oral cavity and oropharynx malignant tumor used significantly more religious coping compared to healthy participants (15). Aukst-Margetic et al. (16) reported that moderate religiosity was associated with perception of worse physical health in Croatian patients with breast cancer. The statement "the illness decreased my faith" was associated with worse quality of life domains: poorer well-being, more pain, poor physical health, more effort to cope, increased fatigue and less general satisfaction. The statement "the faith helps me in illness" was associated with higher social support. In patients with mastectomy, the perception of social support changes depending on the belief that faith helps (16).

In conclusion, we would like to emphasize that religious coping is often used by cancer patients and parents of children with cancer in both developed and developing countries. Religious coping serves multiple functions in long-term adjustment to cancer, such as maintaining self-esteem, providing a sense of meaning and purpose, providing emotional comfort and peace and providing inner strength and a sense of hope in life. We believe that comprehensive studies about religious coping styles of parents of children suffering from cancer in Croatia should be carried out. We believe that these studies to be conducted in the future are going to fill the gap in the literature and make a great contribution to the clinical practices.

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Acknowledgments

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

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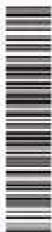

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