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Nurses' Knowledge About Wound Care – Croatian Perspective

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Abstract

Introduction. Nurses' knowledge can directly lead to treatment outcomes.

Aim. To investigate the knowledge and attitudes of nurses regarding chronic wounds and to compare the nurses who participated in the study according to their level of education, years of experience, and place of work.

Methods. Anonymous questionnaire about wound care knowledge was completed by 193 nurses with different educational backgrounds in three counties from central Croatia. The study was conducted during lectures organized through plans for continued education.

Results. Most respondents had >5 years of experience, are employed in a hospital and have secondary education in nursing. Nurses with secondary education and less than five years of experience had better knowledge regarding leg ulcers. Hospital nurses state that they have insufficient knowledge about wound healing; however, doctors are more accessible to them.

Conclusion. This study examined nurses' knowledge and attitudes regarding wound care. Mixed results indicate the need for further and more detailed research.

Introduction

Chronic wounds are wounds that do not heal within 4–6 weeks of origination. They fail to undergo orderly and timely repair to create anatomical and functional integrity over a period of three months or heal (1,2). Roughly 1% to 2% of the general population in developed countries have chronic incurable wounds (3,4). Approximately 2% of all hospitalized patients in the world have a chronic wound, and older adults are at greater risk for developing these wounds because aging impairs the healing process (5,6).

Patients with wounds are cared for by individuals representing a spectrum of disciplines, including generalists, specialist physicians, surgeons, nurses, and related health professionals such as podiatrists (7,8). Chronic wounds are of global and local importance, serve as indicators of the quality of health care, and generate significant morbidity and health care costs (9).

Patients with chronic wounds are likely to be elderly, have difficulty accessing health care, have difficulty moving, be unable to take care of themselves, and/or suffer from dementia. Yet chronic wounds can also occur early in life as a result of certain medical conditions (e.g. sickle cell anemia, vasculitis (10,11)) or in association with immunosuppression (e.g. steroid use (12,13)), kidney impairment (e.g. calciphylaxis (14)), autoimmune diseases (e.g. systemic lupus erythematosus), dermatological diseases (e.g. bullous epidermolysis), or poor motility (which can lead to pressure ulcers (15,16)). They can also be a consequence of peripheral neuropathy (e.g. diabetes) and occur in patients with peripheral arterial and venous disease (e.g. arterial and venous ulcers).

Nurses encounter patients of all ages with chronic wounds, from neonatal to palliative patients. In order to provide care to these patients, it is necessary to have certain knowledge. Because such patients do not commonly present in the nursing discipline, it is often challenging to care for them. Previous research has shown mixed findings: either nurses do not have sufficient knowledge of wound care (17,18) or they have it but do not adequately apply it in practice (19,20).

Effective management of chronic wounds is complex, and to maximize positive outcomes for patients care providers should have appropriate knowledge and skills (5,21). Nurses should know the anatomical, physiological, and pathophysiological specifics of the skin and the most common pathophysiological entities. Adequate wound care requires knowledge of wound assessment procedures, diagnostics, and treatment, including local procedures and holistic approaches. Procedures related to improving the patient's quality of life and mitigating the psychosocial consequences of a chronic wound are no less important. Nevertheless, little is known about nurses' knowledge and skills in wound care, including their formal education and the information they have gathered from experiential learning and clinical practice (22). In Croatia, a sample of nursing students was surveyed on their knowledge of wound care (23).

Nursing education in Croatia has experienced significant changes in recent decades; previously, nurses could attend a secondary school for nurses, and there were few nurses with higher education. In the process which preceded joining the European Union (EU), many nurses completed a bachelor's program, but due to the agreement with the EU, those with only secondary school qualification retained their positions as nurses. The same practice still persists, which is why there are nurses with secondary school education, nurses with a bachelors' degree, and graduate nurses. There is only one specialist study for enterostomal nurses which includes wound care in it curriculum.

Given the changes in nurses' education over the past thirty years, we believe it is important to once again investigate the level of nurses' knowledge of wound care and define possible areas for improvement.

Aim

The aim of this study was to investigate the knowledge and attitudes of nurses about chronic wounds and to compare the participants of the study by level of education, years of experience, and place of work.

Participants and methods

Participants

The study included 200 nurses with secondary education, a bachelor's degree, and completed graduate studies. Multicenter research was conducted in three counties in central Croatia (Bjelovar-Bilogora, Požega-Slavonia, and Sisak-Moslavina). The research was conducted when nurses were present at compulsory educational lectures; these are usually held in each county (in hospitals or public health care centers) several times per year and their purpose is continuing nurses' education, which is necessary for retaining the nursing license. The participants volunteered to complete the survey. The data were collected from January to June 2017.

Methods

The respondents completed a questionnaire specifically created for this study based on a review of similar recent studies. It contained a total of 24 closed and open-ended questions. The first six questions were about demographics (education, years of work experience, job position, source of wound care knowledge, whether they have patients with wounds in their care, and the wound type they provide care for), six regarding basic wound care knowledge, eight about organizational factors related to wound care, and two open questions: one which asked the participants to give their opinion of wound care improvement on the organizational level and one which asked them to provide their own opinions on the topic. In the final question the participants were asked whether they would attend formal wound education if one existed.

SPSS was used to analyse the data.

Results

Demographic data

The study involved 200 respondents whose demographic data are shown in Table 1. We did not find it important to include the sex of participants, and we believe that the amount of work experience is more important than the age of the respondents.

Table 1. **Demographic characteristics of respondents**

Variable	High school education n (%)	Bachelor's degree n (%)	Graduate study n (%)	Total
	132 (66)	57 (28.5)	4 (2)	193
Work experience				
No experience	0 (0)	1 (1.8)	0 (0)	1
0-12 months	8 (6.1)	2 (3.5)	0 (0)	10
13-60 months	14 (10.6)	9 (15.8)	1 (25)	24
61 or more months	110 (83.3)	45 (79)	3 (75)	158
Workplace				
Hospital	81 (61.4)	35 (61.4)	2 (50)	118
Retirement home	12 (9.1)	2 (3.6)	0 (0)	14
Home health care	12 (9.1)	1 (1.8)	0 (0)	13

Patronage	2 (1.6)	12 (21.1)	1 (25)	15
Other	24 (12)	7 (12.3)	1 (25)	32
Source of knowledge of chronic wounds				
Formal education	49 (37.1)	15 (26.3)	2 (50)	80
Internal training at work	29 (22)	21 (36.9)	0 (0)	50
Courses by pharmaceutical companies	15 (11.4)	6 (10.6)	0 (0)	21
Other (work or study)	38 (28.8)	14 (24.6)	2 (50)	54
Type of chronic wound cared for				
Pressure ulcer	153	72	6	231
Diabetic foot	54	27	1	82
Lower leg ulcer	137	58	7	202
Other (postoperative wounds, burns, bite wounds)	14	9	1	24

Knowledge about chronic wounds

Regarding wound knowledge, the questionnaire contained four questions related to common chronic wounds (pressure ulcers, venous ulcers, diabetic foot) and diet. The three questions on specific wounds were true/false questions (Table 2). When asked to answer a multiple-choice question about the type of nutrition preferred in wound healing, the participants mostly selected the answer 'food with proteins' (184, or 95%), with no mutual difference, which is why this answer was not further analysed.

Table 2. **Results of nursing knowledge – true or false questions about education, workplace, and work experience**

Level of education				**Total**	**Value**	**df**	**Asymptotic significance (2-sided)**
		undergraduate	graduate				
	incorrect	0	3	3	5.955a	1	0.014
	correct	129	63	192			
Total		129	66	195			
Work experience							
		<5 years	>5 years		.690[a]	1	0.406
	incorrect	0	3	3			
	correct	36	156	192			
Total		36	159	195			

Place of work							
		in hospital	outside hospital		.048[a]	1	0.826
	incorrect	2	1	3			
	correct	116	76	192			
Total		118	77	195			
Level of education				**Total**	**Value**	**df**	**Asymptotic significance (2-sided)**
		undergraduate	graduate				
	incorrect	78	55	133	7.944[a]	1	0.005
	correct	47	12	59			
Total		125	67	192			
Work experience							
		<5 years	>5 years		5.662[a]	1	0.017
	incorrect	19	114	133			
	correct	17	42	59			
Total		36	156	192			
Place of work							
		in hospital	outside hospital		2.772[a]	1	0.096
	incorrect	84	48	132			
	correct	30	29	59			
Total		114	77	191			
Level of education				**Total**	**Value**	**df**	**Asymptotic significance (2-sided)**
		undergraduate	graduate				
	incorrect	117	61	178	.391[a]	1	0.532
	correct	5	4	9			
Total		122	65	187			

Work experience							
		<5 years	>5 years				
	incorrect	33	145	178	1.206[a]	1	0.272
	correct	3	6	9			
Total		36	151	187			
Place of work							
		in hospital	outside hospital				
	correct	102	75	177	1.433[a]	1	0.231
	incorrect	7	2	9			
Total		109	77	186			

Descriptive statistics and the chi-squared test were used to analyse the results for the three true/false questions, which are shown in Table 3.

In this set of questions, the statement "A patient with a pressure ulcer has to change position every two hours" was correct.

Regarding the level of education, two groups were formed: those with secondary school education and graduate nurses.

A statistical difference was found in the answers to this question: nurses with secondary education and less than five years of experience answered the question correctly. This can be explained by the fact that they received more education about wound care during secondary school (as they can choose "Wound Care" as an elective course) and the fact that less experienced nurses work as home care nurses more frequently, and therefore encounter patients requiring wound care.

The answers to the open-ended question regarding what the choice of wound dressing depends on are shown in Figure 1.

Attitudes toward organizational factors related to wound healing

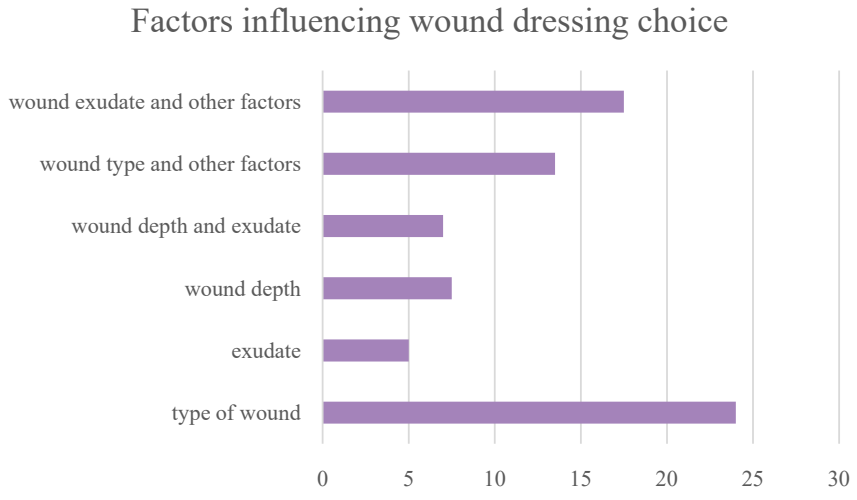

Figure 1. **Respondents' answers about the choice of wound dressing**

Table 3. **The results of the t-test of the participants' answers to questions regarding organizational issues according to work experience**

	t	df	Sig. (2-tailed)	Mean difference	Std. error difference	95% confidence interval of the difference	
						Lower	Upper
T.1. I do not have sufficient knowledge about wound care products.	0.133	193.000	0.894	0.031	0.232	-0.427	0.488
T.2. I feel confident in my abilities in the area of wound management.	-0.677	192.000	0.499	-0.133	0.197	-0.521	0.255
T.3. Better availability of wound care products is necessary	-0.415	189.000	0.679	-0.090	0.216	-0.516	0.337
T.4.Wound care patients would benefit from a regional wound care centre.	-1.206	191.000	0.229	-0.232	0.192	-0.611	0.147
T.5. Better communication between home care nurses and doctors is needed.	-1.270	191.000	0.206	-0.240	0.189	-0.613	0.133
T.6. A specialist doctor is easily available when I need advice.	1.424	192.000	0.156	0.357	0.251	-0.137	0.851
T.7. Wound healing is delayed due to inadequate treatments recommended by the doctor.	-0.847	190.000	0.398	-0.188	0.222	-0.626	0.250
T.8. Wound healing is delayed due to patients' non-concordance with treatment.	0.661	190.000	0.509	0.134	0.203	-0.266	0.535

The respondents rated eight statements on a Likert scale from 1 to 5, where 5=completely agree, 4=agree, 3=neither agree nor disagree, 2=somewhat disagree, and 1=completely disagree. The answers are shown in Tables 4-8.

Table 4. **Demographic data on answers to questions regarding organizational issues according to work experience**

	Work experience	N	Mean	Std. deviation	Std. error mean
T.1. I do not have sufficient knowledge about wound care products.	<5 years	36	2.86111	1.073120	0.178853
	>5 years	159	2.83019	1.293643	0.102593
T.2. I feel confident in my abilities in the area of wound management.	<5 years	36	3.6389	0.89929	0.14988
	>5 years	158	3.7722	1.09950	0.08747
T.3. Better availability of wound care products is necessary.	<5 years	35	4.00000	1.057188	0.178697
	>5 years	156	4.08974	1.177048	0.094239
T.4. Wound care patients would benefit from a regional wound care centre.	<5 years	36	3.97222	1.133543	0.188924
	>5 years	157	4.20382	1.017405	0.081198
T.5. Better communication between home care nurses and doctors is needed.	<5 years	35	4.11429	1.050810	0.177619
	>5 years	158	4.35443	1.003662	0.079847
T.6. A specialist doctor is easily available when I need advice.	<5 years	36	3.5278	1.40379	0.23397
	>5 years	158	3.1709	1.34587	0.10707
T.7. Wound healing is delayed due to inadequate treatments recommended by the doctor.	<5 years	35	3.0286	1.09774	0.18555
	>5 years	157	3.2166	1.20532	0.09620
T.8. Wound healing is delayed due to patient non-concordance with treatment.	<5 years	35	3.8286	1.01419	0.17143
	>5 years	157	3.6943	1.10164	0.08792

Table 5. **The results of the t-test of the participants' answers to questions regarding organization according to the level of education**

	t	df	Sig. (2-tailed)	Mean difference	Std. error difference	95% confidence interval of the difference	
						Lower	Upper
T.1. I do not have sufficient knowledge about wound care products.	0.707	194.000	0.480	0.133	0.188	-0.238	0.503
T.2. I feel confident in my abilities in the area of wound management.	-0.344	193.000	0.732	-0.055	0.160	-0.371	0.261
T.3. Better availability of wound care products is necessary.	1.729	190.000	0.085	0.302	0.175	-0.042	0.647
T.4. Wound care patients would benefit from a regional wound care centre.	-0.257	192.000	0.797	-0.040	0.157	-0.350	0.269
T.5. Better communication between home care nurses and doctors is needed.	0.301	192.000	0.763	0.046	0.153	-0.255	0.347
T.6. A specialist is easily available when I need advice.	0.557	193.000	0.578	0.114	0.204	-0.289	0.517
T.7. Wound healing is delayed due to inadequate treatments recommended by a doctor.	-0.004	191.000	0.997	-0.001	0.180	-0.356	0.354
T.8. Wound healing is delayed due to patient non-concordance with treatment.	0.405	191.000	0.686	0.066	0.164	-0.257	0.390

Table 6. **Demographic data on answers to questions regarding organizational issues according to level of education**

	Level of education	N	Mean	Std. deviation	Std. error mean
T.1. I do not have sufficient knowledge about wound care products	undergraduate	128	2.88281	1.214227	0.107324
	graduate	68	2.75000	1.320052	0.160080
T.2. I feel confident in my abilities in the area of wound management.	undergraduate	127	3.7244	1.05166	0.09332
	graduate	68	3.7794	1.09061	0.13226
T.3. Better availability of wound care products is necessary.	undergraduate	125	4.16800	1.060554	0.094859
	graduate	67	3.86567	1.313052	0.160415
T.4.Wound care patients would benefit from a regional wound care centre	undergraduate	126	4.15079	1.103213	0.098282
	graduate	68	4.19118	0.918424	0.111375
T.5. Better communication between home care nurses and doctors is needed.	undergraduate	126	4.32540	1.026289	0.091429
	graduate	68	4.27941	0.990184	0.120078
T.6. A specialist doctor is easily available when I need advice.	undergraduate	127	3.2756	1.34328	0.11920
	graduate	68	3.1618	1.38876	0.16841
T.7. Wound healing is delayed due to inadequate treatments recommended by a doctor.	undergraduate	127	3.1811	1.15757	0.10272
	graduate	66	3.1818	1.23922	0.15254
T.8. Wound healing is delayed due to patient non-concordance with treatment.	undergraduate	126	3.7381	1.11124	0.09900
	graduate	67	3.6716	1.03555	0.12651

Table 7. **The results of the t-test of the participants' answers to questions regarding organization according to place of work**

	t	df	Sig. (2-tailed)	Mean difference	Std. error difference	95% confidence interval of the difference	
						Lower	Upper
T.1. I do not have sufficient knowledge about wound care products.	3.890	193.000	0.000	0.688	0.177	0.339	1.037
T.2. I feel confident in my abilities in the area of wound management.	-1.679	192.000	0.095	-0.260	0.155	-0.564	0.045
T.3. Better availability of wound care products is necessary.	1.047	189.000	0.296	0.179	0.171	-0.158	0.517
T.4. Wound care patients would benefit from a regional wound care centre.	0.543	192.000	0.588	0.083	0.153	-0.218	0.384
T.5. Better communication between home care nurses and doctors is needed.	1.445	191.000	0.150	0.215	0.149	-0.078	0.508
T.6. A specialist is easily available when I need advice.	2.844	192.000	0.005	0.555	0.195	0.170	0.940
T.7. Wound healing is delayed due to inadequate treatments recommended by a doctor.	0.575	190.000	0.566	0.101	0.175	-0.244	0.445
T.8. Wound healing is delayed due to patient non-concordance with treatment.	0.510	190.000	0.611	0.081	0.159	-0.233	0.395

Table 8. **Demographic data on answers to questions regarding organizational issues according to place of work**

	Place of work	N	Mean	Std. deviation	Std. error mean
T.1. I do not have sufficient knowledge about wound care products	hospital	117	3.11111	1.216112	0.112430
	other than hospital	78	2.42308	1.200857	0.135970
T.2. I feel confident in my abilities in the area of wound management.	hospital	117	3.6496	1.10887	0.10251
	other than hospital	77	3.9091	0.96220	0.10965
T.3. Better availability of wound care products is necessary.	hospital	114	4.14035	1.096069	0.102656
	other than hospital	77	3.96104	1.250700	0.142531
T.4. Wound care patients would benefit from a regional wound care centre	hospital	116	4.19828	1.006240	0.093427
	other than hospital	78	4.11538	1.092843	0.123740
T.5. Better communication between home care nurses and doctors is needed.	hospital	116	4.39655	0.940669	0.087339
	other than hospital	77	4.18182	1.108903	0.126371
T.6. A specialist doctor is easily available when I need advice.	hospital	116	3.4655	1.26099	0.11708
	other than hospital	78	2.9103	1.43415	0.16239
T.7. Wound healing is delayed due to inadequate treatments recommended by a doctor.	hospital	115	3.2174	1.14542	0.10681
	other than hospital	77	3.1169	1.24577	0.14197
T.8. Wound healing is delayed due to patient non-concordance with treatment.	hospital	115	3.7565	0.98757	0.09209
	other than hospital	77	3.6753	1.20789	0.13765

Differences were found in two claims: hospital nurses claimed that they have insufficient knowledge and stated that doctors are more available for consultations.

Almost 73% (N=146) of participants would attend formal wound care education. 4% (N=8) of those would attend such education only if it were free, and 69% (N=138) would attend it in any case.

Discussion

In Croatia, a specific system of education provides the health care system with nurses with secondary education who are actively involved in the health care process in accordance with the competencies of the Croatian Chamber of Nurses. Nurses with higher education provide health care in accordance with learning outcomes but with less clearly defined competencies, especially in the field of wound care (24). Moreover, in most cases nurses with secondary education work in home health care, which is reflected in our data.

This combination of factors means that the majority of patients with chronic wounds are cared for by nurses with the least education in that area. Unfortunately, the model of providing additional education and recognition of nurses' qualifications regarding wound care has not taken root in Croatia, although nurses themselves have recognized the need for such education. The European Wound Management Association (25) recommends education at levels 5, 6, and 7 (26-28) . With the exception of formal schooling, our respondents have gained the most knowledge from further education, mostly that provided by pharmaceutical companies. Brazilian researchers have drawn similar conclusions, with the difference that their respondents mostly looked for answers in newspapers, magazines, and similar sources (29).

Four questions were about wound knowledge, one for each of the most common chronic wounds (pressure ulcers, diabetic foot, venous ulcers) and one related to diet.

Small differences in knowledge were found, which was in accordance with previous research (23). This may explain longer healing times for venous ulcers in Croatia (30,31). Several studies have been conducted on nurses' knowledge of wound care, for example on the care of patients with pressure ulcers (32) or venous ulcers (33), on caring for patients in a hospital setting (34,35), and on knowledge of wound care in general (36). Some studies have found knowledge gaps (33,34,36). Others, such as that by Dougdall and Watson, directly cite the link between education and the existence of specialist education in wound care and better wound care (37). Innes-Walker et al. have shown that nursing education directly affects the positive health outcomes of patients with wounds (38), primarily quality of life, because better educated nurses provide their patients with improved education on chronic wounds, and consequently these patients live better with their wounds. Sturkey et al. have shown that improved education among nurses in home care reduces the incidence of wound infection and leads to fewer nurse visits, which in turn reduces costs. Unfortunately, in Croatia there are no calculations of the cost of treatment and care of chronic wounds, nor are there data on the quality and outcomes of treatment.

Our study did not find a correlation between knowledge and work experience, similarly to Zarchi et al. (39), unlike studies in which no difference was observed in terms of either work experience, age, or education (40,41). A more detailed study conducted in Sweden has shown differences in knowledge of the assessment and management of pressure ulcers after graduation (42).

The nutritional status of patients with chronic wounds is extremely important. Such patients often have eating disorders, such as obesity or malnourishment, or they take in too little protein (43). It is promising that so many nurses in this study answered the question on diet correctly.

The participants who work in hospitals are less secure in their knowledge and application of dressings. This may be because nurses in the community treat more wounds and are more likely to encounter medical supplies and innovations in the field of wound care. Otherwise, nurses consider themselves capable of caring for a patient with a wound (44), although a discrepancy can be seen between their knowledge and their self-assessed willingness to provide care.

Nurses in this study did not differ in their responses regarding organizational factors (apart from the ex-

pected result that specialist doctors are more readily available to hospital nurses), generally agreeing that their main problems were poor wound dressings, poor communication between doctors and nurses, and patient interference in their own treatment. Such problems are common in the area of wound care (21,45).

Continuing education provides numerous opportunities for professional advancement, so any nurse who is specially trained in the treatment of chronic wounds can educate not only other health professionals but also patients and their families. This would greatly contribute to the overall health system at all levels of care.

Chronic wounds are a major socioeconomic problem because of their long course of healing and treatment. They also greatly reduce the quality of life of patients and their families. Caring for a patient with a chronic wound requires a multidisciplinary approach that touches on all aspects of the wound. Health care professionals must also be mindful of health care costs, and thus they must be educated to treat chronic wounds as painlessly and efficiently as possible

Limitations of the study

The data were collected using a questionnaire that was based on similar studies and specific Croatian legislative and organizational situations, which is why the results are not generally applicable. As the participants were in a group while answering the questions, there is a possibility that they commented on them among themselves. Although the data are old, they can be used for comparison in future research.

Conclusion

This study examined nurses' knowledge and attitudes about wound care. The research was adjusted to the local educational and legislative framework. It provided mixed results, especially in the knowledge section, with the obvious need for further research in this area.

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ZNANJE MEDICINSKIH SESTARA O ZBRINJAVANJU RANA – HRVATSKA PERSPEKTIVA

Sažetak

Uvod. Znanje medicinskih sestara pridonosi boljim ishodima liječenja.

Cilj. Cilj ovog istraživanja bio je steći uvid u znanje i stavove medicinskih sestara o zbrinjavanju rana s obzirom na duljinu staža, razinu edukacije te mjesto rada.

Metode i ispitanici. Istraživanje je provedeno s pomoću posebno kreiranog anonimnog upitnika. Ispitanici su 193 medicinske sestre i medicinska tehničara različitog stupnja obrazovanja iz tri županije u središnjoj Hrvatskoj. Istraživanje je provedeno tijekom raznih predavanja u sklopu planova trajne edukacije Hrvatske komore medicinskih sestara.

Rezultati. Većina ispitanika imala je više od pet godina radnog staža, zaposleni su u bolnici te imaju srednjoškolsko obrazovanje. Statistički značajne razlike uočene su na području zbrinjavanja venskog ulkusa, gdje su bolje znanje pokazale sestre sa srednjom stručnom spremom i manje godina staža. Medicinske sestre zaposlene u bolnici smatraju da imaju nedostatno znanje o liječenju rana te da su im liječnici dostupniji za konzultacije.

Zaključak. Ovo istraživanje dalo je miješane rezultate s područja znanja i stavova medicinskih sestara o zbrinjavanju kroničnih rana, što ukazuje na potrebu za provođenjem budućih detaljnijih studija

Ključne riječi: palijativna medicina, palijativna skrb, palijativni bolesnik