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KNOWLEDGE OF NURSES/TECHNICIANS ON THE TREATMENT OF CHRONIC WOUNDS IN RELATION TO THE LEVEL OF HEALTHCARE

ZNANJE MEDICINSKIH SESTARA/TEHNIČARA O LIJEČENJU KRONIČNIH RANA U ODNOSU NA NIVOU ZDRAVSTVENE ZAŠTITE

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ABSTRACT

It is estimated that 1 to 2% of the population in developed countries will experience a chronic wound during their lifetime. Nurses are leaders in applying innovations that can create positive results in preventing and treating chronic wounds in patients admitted to acute care hospitals. The aim of the research is to examine the knowledge of nurses-technicians about the knowledge of measures for the prevention and treatment of chronic wounds. In the research of knowledge on the treatment of chronic wounds, 349 respondents participated, employed at the primary and tertiary levels of health care. For the purposes of the research, the authors created a questionnaire based on a review of professional and scientific literature, as well as evidence in practice. The research was conducted through the Chamber of Nurses-Technicians of Sarajevo Canton and the Chamber of Tuzla Canton.

Respondents from Sarajevo Canton worked significantly longer in practice, and 36.2% of respondents worked from 21 to 30 years, and 10.9% of respondents worked longer than 30 years, while among respondents from Tuzla Canton 34.8% of them, worked from 21 to 30 years and 9.9% worked for more than 30 years. 43.9% of respondents from Tuzla Canton and 39.6% of respondents from Sarajevo Canton had a certificate for the care of chronic wounds (X^2 = 9.077; p = 0.028). The assessment of knowledge is in a direct positive relationship with the level of health care (rho = 0.187; p = 0.001).

Analysis of the knowledge in relation to the level of health care showed that respondents employed at the tertiary level of health care, have significantly better knowledge

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about the treatment of chronic wounds. We conclude that the assessment of knowledge is in a direct positive relationship with the level of health care.

Keywords: nurses/technicians, chronic wounds, health care, knowledge

SAŽETAK

Procjenjuje se da će 1 do 2% stanovništva tokom života u razvijenim zemljama doživjeti hroničnu ranu. Medicinske sestre su vodeće u primjeni inovacija koje mogu stvoriti pozitivne rezultate u prevenciji i liječenju hroničnih rana kod pacijenata primljenih u bolnice za akutnu njegu. Cilj istraživanja je ispitati znanje zdravstvenih radnika u primarnom i tercijarnom nivou o tretmanu hroničnih rana u dva odabrana Kantona. U istraživanju znanja o tretiranju hroničnih rana, učestvovalo je 349 ispitanika, zaposlenih u primarnom i tercijarnom nivou zdravstvene zaštite. Istraživanje je provedeno u saradnji sa Komorama Medicinskih sestara-tehničara Kantona Sarajevo i Komorama Zdravstvenih tehničara Tuzlanskog Kantona. Istraživanje je provedeno u periodu od 04.12.2021. do 11.02.2022. godine. Za istraživanje je korišten autorski upitnik.

Ispitanici iz Kantona Sarajevo su značajno duže radili u praksi, te je 36,2% ispitanika radilo od 21 do 30 godina, te 10,9% ispitanika je radilo duže od 30 godina, dok je među ispitanicima izTuzlanskog Kantona njih 34,8% radilo od 21 do 30 godinai 9,9 % je radilo duže od 30 godina. Cerifikat za zbrinjavanje hroničnih rana posjedovalo je 43,9% ispitanika iz Tuzlanskog kantona i 39,6% ispitanika iz Kantona Sarajevo (X2=9,077; p=0,028). Ocjena znanja je u direktnoj pozitivnoj vezi sa nivoom zdravstvene zaštite (rho=0,187; p=0,001).

Analizom znanja u odnosu na nivo zdravstvene zaštite, uočava se da ispitanici zaposleni na tercijarnom nivou, imaju značajno bolje znanje o tretmanu hroničnih rana. Zaključujemo da je ocjena znanja u direktnoj pozitivnoj vezi sa nivoom zdravstvene zaštite.

Ključne riječi: medicinske sestre/tehničari, hronične rane, zdravstvena njega, znanje

INTRODUCTION

Chronic wounds are often disguised as an accompanying condition and represent a silent epidemic that affects a large part of the world's population. It is estimated that 1 to 2% of the population will experience a chronic wound during their lifetime in developed countries. With the ageing of the population, an increase in mass non-communicable diseases is expected, including complications of the disease, among which chronic wounds have a special place (Järbrink et al., 2016, p. 152). Epidemiological analyses in the routine care of chronic wounds are rare, and published studies show large variations. In the U.S., chronic wounds affect 6.5 million patients with more than $ 25 billion each year that the healthcare system spends on treating wound-related complications (Sen. CK., Et., 2009, pp. 763-71.).

A chronic wound can be defined as a wound that has failed to undergo an orderly and timely reparative procedure to achieve anatomical and functional integrity over a period of 3 months or has undergone a healing procedure without establishing lasting, anatomical and

functional results. Based on the causal etiologies, chronic wounds are divided into pressure ulcers – decubitus (nonhealing pressure ulcers NHPU), diabetes ulcers - diabetic foot ulcers (diabetic foot ulcers DFU), venous ulcer (VU) and ulcers due to arterial insufficiency (Järbrink et al., 2016, p. 152).

Chronic wounds have a significant impact on the health and quality of life of patients and their families, causing pain, loss of function and mobility, depression and anxiety, stigma and social isolation, financial burden, long hospital stays and chronic morbidity or even death (Järbrink et al., 2016. pp. 152; Olsson et al., 2019. pp. 114-125.)

Chronic wound management remains a challenge in terms of prevalence and complexity. Over the past decade, significant progress has been made in understanding the science of wound healing, prompting numerous publications and the development of hundreds of therapy options. A simplified review of evidence-based criteria is needed to assist in the accurate diagnosis and appropriate treatment of chronic wounds in all healthcare facilities (Li et al., 2020, pp. 245-263).

If there is a field in which a nurse can practice to a large extent within her role, that is, in complete autonomy, and that is, from the preventive to the curative phase, it is the field of chronic wounds. It is expected that highly educated nurses/technicians will be additionally educated in the management process in the prevention and treatment of chronic wounds. In this way, they can competently take a dominant role in the process of prevention and treatment. Accurate wound assessment and knowledge of the implications of care with specific wound care measures (cleansing, debridement and dressings) are important for quality care. New technologies are advancing traditional wound care measures with the goal of effective comfortable wound care to promote the restoration of skin integrity, and nurses must be up to date with new technologies (Harvey, 2005, pp. 143-57).

Nursing interventions in the process of chronic wound care consist primarily in reducing the number of bacteria (surgical debridement, regular dressing, avoidance of routine use of antiseptics in the treatment of chronic wounds, targeted use of antibiotics according to antibiogram of the local wound swab, treatment of underlying disease). Wound care is based on scientific principles that aim to apply an ideal wound dressing that will ensure optimal wound healing conditions at all stages and protect unprotected surfaces from environmental influences. Today, there are a number of specific wound dressings on the market that are applied according to the type of wound, i.e., according to the stage of tissue healing. Proper choice of bandage is crucial for the process of healing a chronic wound (Pražić, 2009 pp. 78-79.).

The aim of the research is to examine the knowledge of nurses-technicians about the knowledge of measures for the prevention and treatment of chronic wounds..

1. RESPONDENTS AND METHODS

349 respondents employed in the primary and tertiary level of health care participated in the research of knowledge on the treatment of chronic wounds. The research was conducted in cooperation with the Chambers of Nurses-Technicians of Sarajevo Canton and the Chambers of Health Technicians of Tuzla Canton, whose approval we received. The research was

conducted in the period from 04.12.2021. to 11.02.2022. The research is a quantitative, cross-sectional, observational-analytical, comparative study.

The author's questionnaire was created for the research, on the basis of a review of available professional and scientific literature related to chronic wounds, and on the basis of which the knowledge of nurses-technicians about chronic wounds can be tested. One part of the questionnaire was taken from the Wound Care Survey. The questionnaire was distributed through an official request of the registered Chambers and the Association of Nurses and Technicians in Bosnia and Herzegovina. The questionnaire was in the form of a Google form.

2. RESULTS

Out of the total number of 349 respondents, 100 of them worked in one of the primary healthcare institutions, while 249 worked at the tertiary level in Tuzla Canton and Sarajevo Canton. In the group of respondents from Tuzla Canton, 59 (64.1%) were female, while in the group of respondents from Sarajevo Canton 228 (88.7%) were female. A significant difference in the gender distribution of the respondents was found ($p < 0.001$). In relation to age, the majority of respondents from Tuzla Canton were aged 46 to 55 (33.7%) and aged 36 to 45 (33.7%). Respondents from Sarajevo Canton were mostly aged 36 to 45 (45.5%) and aged 46 to 55 (23.7%). No significant difference was found in the age distribution of the respondents ($X2 = 7.182$; $p = 0.207$). The distribution of respondents in relation to the workplace determined that 82.6% of respondents from Tuzla Canton worked as nurses/technicians, while 75.9% of respondents from Sarajevo Canton did the same. The distribution of respondents in relation to the workplace did not reveal a significant difference in the examined sample ($X2 = 3.393$; $p = 0.335$).

The position of responsible nurse/technician, i.e., head nurse/technician of the department was held by 6.5% of respondents from Tuzla Canton and 12.8% of respondents from Sarajevo Canton. The position of the head nurse of the institution/hospital was held by 9.8% of respondents from Tuzla Canton and 8.9% of respondents from Sarajevo Canton. Respondents from Sarajevo Canton worked significantly longer in practice, and 36.2% of respondents worked from 21 to 30 years, and 10.9% of respondents worked longer than 30 years, while among respondents from Tuzla Canton 34.8% of them worked from 21 to 30 years and 9.9% worked for more than 30 years. In the length of service from 11 to 20 years, it is noticed that 20.7% of respondents are from Tuzla Canton and 33.1% from Sarajevo Canton. 43.9% of respondents from Tuzla Canton and 39.6% of respondents from Sarajevo Canton had a certificate for chronic care ($X2 = 9.077$; $p = 0.028$).

Examination of knowledge, based on 17 questions, found that respondents from Tuzla Canton answered correctly on average 13 (76.47%) questions (11 to 14), as well as respondents from Sarajevo Canton, who answered correctly on average 13 (76.47%) questions (11 to 14). No significant difference was found in relation to the number of correct answers in the total samples (Mann Whitney $U = 11689.0$; $p = 0.871$). Analysis of knowledge in relation to the level of health care shows that respondents employed at the tertiary level have significantly better knowledge about the treatment of chronic wounds (Mann Whitney $U = 8846.0$; $p < 0.001$); Figure 1.

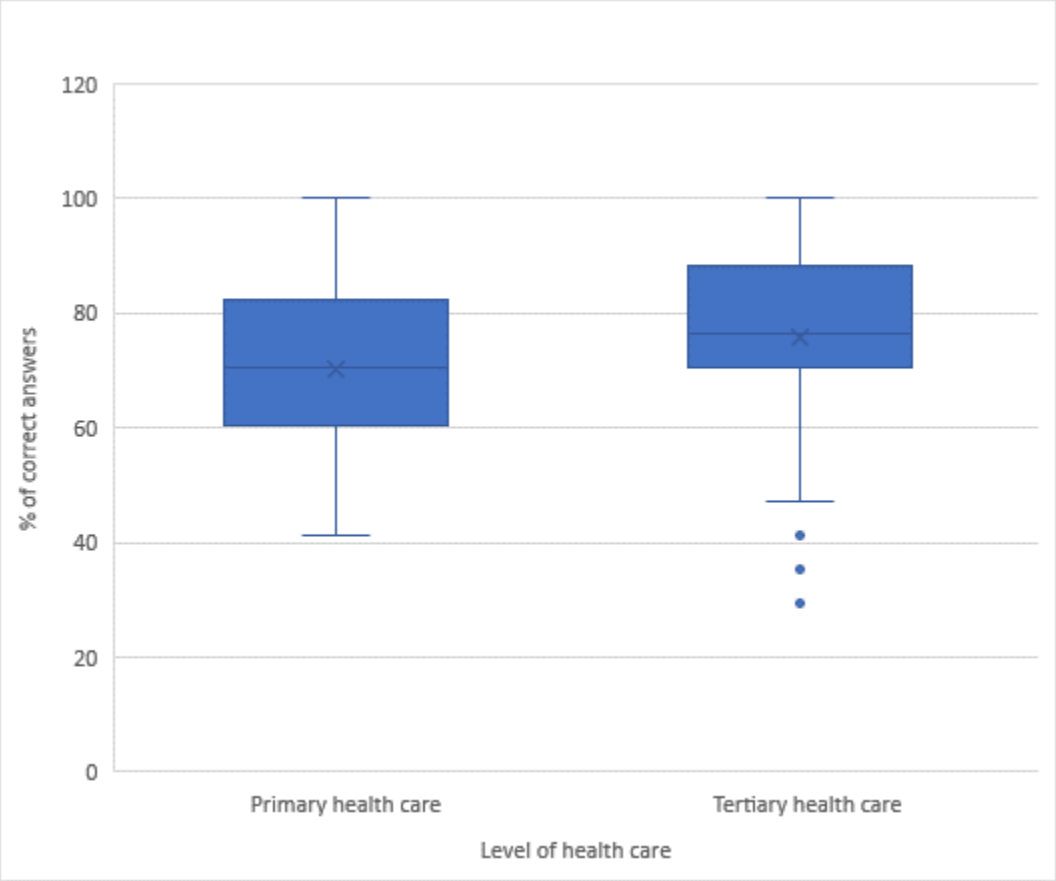

Figure 1. Rate of correct answers in relation to the level of healthcare

According to Spearman's correlation test, the number of correct answers in the knowledge test cannot be related to education (rho = 0.092; p = 0.087). The assessment of knowledge is in a direct positive relationship with the level of health care (rho = 0.187; p = 0.001). A significant correlation was found between the assessment of the knowledge of the respondents and the possession of a certificate for the care of chronic wounds (rho = 0.179, p = 0.001). No correlation was found with the length of service, level of education or job they held.

Table 1. Analysis of knowledge in relation to the level of education among respondents from the primary and tertiary levels of healthcare

Education	Level of healthcare	Median	IK rage	Mann-Whitney U	p
Secondary education	PHC	70,59	(58,8-76,5)	2773,5	0,002
	THC	76,47	(64,7-88,2)		
Higher education	PHC	70,59	(58,8-70,6)	19,500	0,055
	THC	79,41	(70,6-88,2)		
University degree	PHC	70,59	(64,7-82,4)	1246,50	0,008
	THC	82,35	(70,6-82,4)		

Among the respondents with secondary education, a significant difference was found in the quality of knowledge in relation to the level of health care (p = 0.002). Among the respondents with higher education, no significant difference in the quality of knowledge was found (p = 0.055). Among the respondents with a university degree, it was found that the respondents from the tertiary level had significantly better knowledge (p = 0.008). In relation to the workplace, it was found that nurses/technicians from the primary level of health care, on average, answered 12 (70.59%) questions accurately, with an interquartile range from 11 to 13 questions, while nurses/technicians from of the tertiary level of health care answered on average 13 (76.47%) questions, with an interquartile range from 12 to 15. A statistical difference in the knowledge of nurses/technicians was determined based on the level of health care (p <0.001). No significant difference in knowledge was found in the responsible nurses/technicians (p = 0.695), while the head nurses/technicians employed in the tertiary level of health care showed significantly better knowledge (p = 0.034) (Table 2).

Table 2. Knowledge of respondents in relation to workplace

	PHC		**THC**		**Mann-Whitney U**	**p**
	Median	IK range	Median	IK range		
Nurse/technician	70,59	64,7-76,47	76,47	70,59-88,24	5391,0	**<0,001**
Responsible nurse, department head nurse	79,41	70,59-91,18	76,47	70,59-82,35	112,0	0,695
Head nurse ofinstitution/organizational unit/hospital	70,59	58,82-82,35	82,35	76,47-88,24	62,0	**0,034**

In relation to the length of service, respondents from the tertiary level of health care had significantly better knowledge in the group of respondents with work experience up to 10 years (Mann Whitney U = 442.0; p = 0.004); and in groups with length of service from 11 to 20 years (Mann Whitney U = 856.0; p = 0.047), and from 21 to 30 years (Mann Whitney U = 1009.0; p = 0.006). Only among respondents with a length of service over 30 years, no significant difference was found in the assessment of the quality of knowledge (Mann Whitney U = 132.50; p = 0.612). Healthcare workers with a certificate for the care of chronic wounds from the primary level of health care answered correctly on average 14 (10-14) questions, or 82.35% of questions, as well as tertiary level respondents who answered correctly on average 14 (13) -15) questions, i.e., to 82.35% of questions, without significant statistical difference (Mann Whitney U = 792.5; p = 0.222). By classifying knowledge at determined levels (Figure 2), it was noticed that 13.0% of respondents from the primary level of health care and 10.0% of respondents from the tertiary level of health care show poor knowledge. Knowledge with significant deficiencies is shown by 49.0% of respondents from the primary level of health care and 25.5% of respondents from tertiary health care. 38% of respondents from primary health care and 67.4% from tertiary health care show good knowledge (> 75%). Distribution of respondents in relation to the percentage of correct answers determined that good knowledge was possessed by significantly more frequent respondents from the tertiary level of health care (X2 = 27.738; p <0.001).

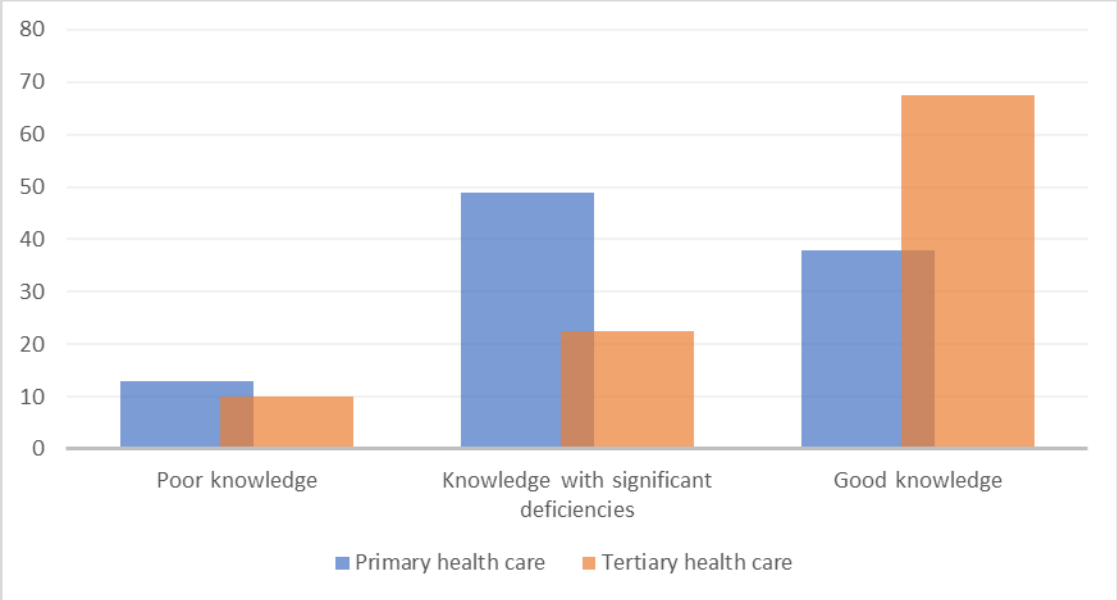

Figure 2. Classification of knowledge in the analyzed sample

3. DISCUSSION

In this study, a significant difference was found in the gender distribution of respondents ($p < 0.001$), where females predominate. No significant difference was found in the age distribution of the respondents ($p = 0.207$). 43.9% of respondents from Tuzla Canton and 39.6% of respondents from Sarajevo Canton had a certificate for the care of chronic wounds. We can conclude that a relatively small number of nurses have a certificate of chronic wound care in both cantons, and its importance is emphasized by many studies. In Andalusia, research by Jiménez-García et al. has been conducted on the impact of educating nurses on chronic wounds on their prevalence and treatment. Three measurements were conducted: before the training in 2015, one year after the training in 2016 and 2 years after the training in 2017. The training was conducted on a total of 2,717 health teams with a total of 95,095 teaching hours. In addition, a total of 3,871 consultations were conducted. The prevalence of patients with chronic wounds in the home care program and nursing homes has decreased significantly, to almost 50%. The adequacy of the treatment has increased to 90%, and savings of € 250,000 in dressings have been achieved in just 2 years. The authors concluded that adequate education and health spending have been achieved by streamlined and effective health care provided for patients with chronic wounds (Jiménez-García et al. 2019, pp. 74-82). In the United States, Zulkowski et al. point out that 70% of nurses do not have sufficient training in the field of chronic wounds and that the program lacks several important contents (Zulkowski et al., 2015, pp. 10-13), which is correlated with the results of our research.

The aim of the research of Gonzaga de Faria et al. was to assess the knowledge of nurses on the assessment and treatment of chronic wounds and to describe the clinical practice in wound care. The study presents a cross-sectional study with 55 nurses interviewed at the hospital. Of the total number of participants, 92.7% had inadequate knowledge on this topic. The majority, 67.3%, stated that they did not acquire enough knowledge about wound care.

The authors conclude that most nurses have lower-than-desired levels of knowledge in relation to chronic wound care (Gonzaga de Faria et al., 2016, pp. 4532-8).

In this research, based on 17 questions, it was determined that respondents from Tuzla Canton answered correctly on average 13 (76.47%) questions (11 to 14), as well as respondents from Sarajevo Canton, who answered correctly on average on 13 (76.47%) questions (11 to 14). No significant difference was found in relation to the number of correct answers in the total samples ($p = 0.871$). Analysis of knowledge in relation to the level of health care shows that respondents employed at the tertiary level have significantly better knowledge about the treatment of chronic wounds. A significant correlation was found between the assessment of the respondents' knowledge and the possession of a certificate for the care of chronic wounds ($p = 0.001$). No correlation was found with the length of service, level of education or job they held.

In a study by McCluskey et al. whose goal was to investigate the knowledge of nurses and competence for assessment and management of wounds in the hospital environment, whereby data from 150 nurses were collected, it is concluded that the knowledge of the parameters of wound assessment was very good. Statistically significant correlations were found between knowledge and ability to assess wounds in nurses who had updated their knowledge of wound care in the previous two years. The findings also suggest that multiple treated wounds per week significantly affect competencies but not knowledge (McCluskey and McCarthy. G. 2012.p.37-47). A study similar to this one in Pakistan was conducted by Bilal et al. The sample consisted of 250 nurses working in two tertiary care hospitals. The study was conducted over a period of three months and included all nurses who had at least one year of clinical experience in the care of diabetic ulcer. In the results, the authors state that only 54% of nurses had adequate knowledge about diabetic foot ulcers. The mean assessment of knowledge was 74.9 (± 9.5). Nurses performed best in the field of ulcer treatment with 65.3% of participants who were well acquainted with the topic. The overall attitude of nurses towards patients with diabetic ulcers was positive (Bilal et al., 2018).

In this research, among the respondents with secondary education, a significant difference in the quality of knowledge was found in relation to the level of health care ($p = 0.002$). Among the respondents with higher education, no significant difference in the quality of knowledge was found ($p = 0.055$). Among the respondents with university degree, it was found that the respondents from the tertiary level had significantly better knowledge ($p = 0.008$). A statistical difference in the knowledge of nurses / technicians was found based on the level of health care ($p <0.001$). No significant difference in knowledge was found in the responsible nurses / technicians ($p = 0.695$), while the head nurses / technicians employed in the tertiary level of health care showed significantly better knowledge ($p = 0.034$). These results are to be expected, given that the tertiary level of health care is much more common with the treatment of chronic wounds, compared to the primary. The purpose of the study by Goudy-Egger et al. was to determine whether nurses knowledge of current chronic wound care would differ after attending an educational workshop that highlighted evidence-based clinical practices in the treatment of chronic wounds. Thirty-one nurses agreed to participate in this study. There was a statistically significant increase in the knowledge of nurses from pre-testing to post-testing ($p <, 05$). Most nurses reported referring patients to wound care specialists and believed they were inadequately prepared to care for patients with chronic wounds.

These findings support the need for continuous education about changes in chronic wound care (Goudy-Egger and Dunn, 2018.p.454-459).

In this study, in relation to the length of service, respondents from the tertiary level of health care had significantly better knowledge in the group of respondents with work experience up to 10 years, and in groups with length of service from 11 to 20 years and 21 to 30 years. Only among respondents with a length of service over 30 years, no significant difference was found in the assessment of the quality of knowledge, which is also to be expected because through years of work experience there is an opportunity for additional professional education. By classifying the knowledge in this research according to the established levels, it was noticed that 13.0% of respondents from the primary level of health care and 10.0% of respondents from the tertiary level of health care show poor knowledge. Knowledge with significant deficiencies is shown by 49.0% of respondents from the primary level of health care and 25.5% of respondents from tertiary health care. 38% of respondents from primary health care and 67.4% from tertiary health care show good knowledge (> 75%). Distribution of respondents in relation to the percentage of correct answers determined that good knowledge was possessed by significantly more frequent respondents from the tertiary level of health care.

In a study by Kielo-William et al. the aim was to describe the level of competence in chronic wound healing among graduate nurses and pediatric students compared to professionals and to develop and test a new instrument (C/WoundComp) that assesses theoretical and practical competence in chronic wound care and attitudes towards wound care. Data (N = 135) were collected in 2019 from four groups (1): graduate nursing students (n = 44) (2); graduate pediatric students (n = 28) (3); graduate nurses (n = 54); and (4) pediatricians (n = 9). According to the results, the overall average grade of student competencies was 62%. The average grade for theoretical competence was 67% and for practical competence 52%. The level of competence of students was statistically significantly lower than the competence of experts (P <, 0001), but students showed a positive attitude towards the care of chronic wounds (Kielo-Viljamaa., 2021.p.62-78).

CONCLUSION

1. In this research, based on 17 questions, it was determined that respondents from Tuzla Canton answered correctly on average 13 (76.47%) questions (11 to 14), as well as respondents from Sarajevo Canton, who answered correctly on average on 13 (76.47%) questions (11 to 14). No significant difference was found in relation to the number of correct answers in the total samples so the knowledge about chronic wounds in relation to the cantons is quite at the same level. Analysis of knowledge in relation to the level of health care shows that respondents employed at the tertiary level have significantly better knowledge about the treatment of chronic wounds.
2. In relation to the length of service, respondents from the tertiary level of health care had significantly better knowledge in the group of respondents with work experience up to 10 years (Mann Whitney U = 442.0; p = 0.004); and in groups with

length of service from 11 to 20 years (Mann Whitney U = 856.0; p = 0.047), and from 21 to 30 years (Mann Whitney U = 1009.0; p = 0.006).

3. A significant correlation was found between the assessment of the respondents' knowledge and the possession of a certificate for the care of chronic wounds (rho=0,179, p=0,001), while no connection was found with the length of service, level of education or job they performed.
4. Wound care nurses have been identified as a key element in improving health outcomes. However, there is still fragmented knowledge about the outcomes associated with their practice in people with chronic wounds.

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