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DOES THE ERA OF GLOBALIZATION DICTATE A CHANGE IN THE DEFINITION OF PUBLIC HEALTH?

ALI NAREKUJE OBDOBJE GLOBALIZACIJE SPREMEMBO OPREDELITVE JAVNEGA ZDRAVJA?

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ABSTRACT

Globalization has a major impact on public health in all countries of the world. Unfortunately, there are attempts to treat global challenges in the field of public health separately from national ones, following the model of tropical medicine, where the focus of action was in fact primarily on the identification and control of tropical diseases. This was especially in the interest of countries that colonized certain areas in the tropical part of the world. Global health, which is to some extent the successor of tropical medicine, cannot be a separate entity. The lines between global health and public health are blurring. In essence, global health is just another aspect of public health, important both in terms of recognizing the situation and taking action to improve the situation. The problems are mostly no longer local or national, and, to a greater or lesser extent, already affect the entire population or threaten the health of future generations.

Such a view of global health also requires different approaches. Of course, due to cultural and socio-economic characteristics, the field and method of work must be adapted to the specific local environment, but nevertheless, these are challenges that are present everywhere. Therefore, it is vital that we act decisively, with a united approach – regardless of where we live and at what stage of social development we are. The world has become one, so the division into public health and global public health has become meaningless.

Keywords:
Global health development
Public health
Tropical medicine

IZVLEČEK

Globalizacija močno vpliva na javno zdravje v vseh državah sveta. Žal obstajajo poskusi, da bi globalne izzive na področju javnega zdravja obravnavali ločeno od nacionalnih in sicer po vzoru tropske medicine, kjer je bil fokus delovanja dejansko predvsem na prepoznavanju in obvladovanju tropskih bolezni. To je bilo še posebej v interesu držav, ki so v tropskem predelu sveta kolonizirale določena območja. Globalno zdravje, ki je do neke mere naslednik tropske medicine, ne more biti posebna entiteta. Meje med globalnim zdravjem in javnim zdravjem se brišejo. V bistvu je globalno zdravje samo še en vidik javnega zdravja, pomemben tako v povezavi s prepoznavanjem razmer kot tudi ukrepanjem za izboljšanje stanja. Problemi večinoma niso več lokalni ali nacionalni, temveč, v večji ali manjši meri, že sedaj prizadenejo celotno prebivalstvo oziroma ogrožajo zdravje prihodnjih generacij.

Tak pogled na globalno zdravje pa terja tudi drugačne pristope. Seveda je zaradi kulturnih in socialno-ekonomskih značilnosti treba področje in način dela prilagoditi specifičnemu lokalnemu okolju, a kljub temu so to izzivi, ki so prisotni povsod. Zato je ključnega pomena, da delujemo odločno, enotno in povezano - ne glede na to, kje živimo in na kateri stopnji družbenega razvoja smo. Svet je postal eno, zato je postala delitev na javno zdravje in globalno javno zdravje nesmiselna.

Ključne besede:
razvoj globalnega zdravja
javno zdravje
tropska medicina

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1 INTRODUCTION

Globalization, which is spreading into every part of our lives, has a strong impact on public health. Unfortunately, in the era of globalization, the process of destroying the meaning of public health (PH) in the current sense began. This process is tending towards narrowing the meaning of the concept of PH down to merely its function within national frameworks, while the concept of global health (GH) should assume a unifying role in terms of solving health problems that spread beyond national frameworks. Today we can read this in the description of what GH is, for example on some websites (1) or in the presentation of some textbooks (2). On the other hand, we can also perceive the process of extension of the concept of PH in the sense of globalization. For example, today one of the world's most important textbooks in the field of PH no longer has PH in its title, but global PH (GPH) (3). It could be said that there is actually a kind of rivalry for position between the concept of PH which also includes GH, and the concept of GH which excludes PH. Thus, one of the most important challenges for PH today should be how to convince the world that the concept of PH with GH makes more sense than the concept of GH without PH.

Interestingly, PH was present throughout the development of GH, directly or indirectly. If we go back historically, the concept of GH superseded the concept of international public health (IPH), which in turn superseded the concept of tropical medicine (TM). Throughout the history of IPH and GH, activities took place mainly in former European colonies in the form of direct or indirect PH measures, and financial and material aid from developed countries.

2 MODERN DEVELOPMENT OF PUBLIC HEALTH

For a long time, infectious diseases were the biggest health problem of populations all over the world, but at the end of the 19th and in the first third of the 20th century, the situation in the more developed countries of the world improved with vaccination and good sanitation as the strongest public health measures, and then with the accelerated establishment of public schools of health and international foundations and intergovernmental agencies interested in public health it began to slowly change. As a result, the burden of infectious diseases began to decline significantly in these countries, but not in developing countries. People travelling to and from these countries thus posed the threat of reintroducing infectious diseases to more developed parts of the world. This was especially true for countries that had their colonies in less developed parts of the world. This led to the development of a special branch of medicine dealing with the control of infectious diseases in these parts of the world. Since they were largely located in tropical regions of the world, the branch was called tropical medicine (TM) – an interdisciplinary branch of medicine that prevents the spread of infectious tropical diseases. It covers all infectious diseases that thrive in humid or hot conditions (4, 5). TM experienced a major development step in the late 1970s at the WHO conference in Alma Ata, which called for international efforts to expand and strengthen the capacity of health services in low- and middle-income countries. TM's concern, which was focused on the control of infectious diseases of warm climates, extended to the provision of health services and thus to the reduction of morbidity among the inhabitants in the most depressed environments. This laid the foundation for IPH.

The field of IPH developed on the basis of the fact that towards the end of the 20th century, other health problems that required international treatment, such as non-communicable diseases and their determinants, began to come to the forefront, and the need for a new PH branch – IPH – arose, a branch whose important feature was the application of PH principles to the management of the health problems of less developed countries and their local and global determinants (6).

However, development did not stop. As the world increasingly began to face the fact that the negative impacts of both the social and physical environment on human health are not limited only to less developed countries, but also occur within developed countries, the IPH concept slowly transformed into the GH concept, maintaining a similar focus to IPH, but placing much greater emphasis on health problems that affect many countries at different levels of development and health problems that are strongly influenced by transnational determinants such as climate change (6, 2). The expanded concept offers an opportunity to address cross-border issues and differences in health and access to health also in developed countries, not only in less developed ones. In this process, the application of PH principles is continuously present, which means that the two concepts, PH and GH, are difficult to separate.

Another challenge for both PH and GH is that within both concepts there still persist remnants of the historical development, which somewhat depends on the part of the world. In some European countries, for example, the process of transformation from classical PH to modern PH has not yet come to an end, which means that they cling to the old entities of PH, social medicine, hygiene and epidemiology of infectious diseases. On the other hand, one section of GH advocates claims that the problem of GH is only infectious diseases, which brings the concept back to the beginnings of its development.

Thus, an important modern challenge for PH is to try to communicate that PH and GH concepts are fundamentally a single concept, but that some PH problems need to be

solved at the global level, some at the regional level, and some only at the national level. But this does not mean that the working methods are different. On the contrary – they are very similar, only the levers for resolving them are different. So it is actually just different PH levels.

If we take Slovenia as an example, the PH of the country is always placed in the context of the environment – social and physical – in which it is embedded. But it is not only the context of the national environment. As a member of the European Union (EU), Slovenia is obliged to comply with EU PH guidelines and to report to the EU on risks relating to the entire EU, which means the regional level of PH. The PH of the EU, and thus also the PH of Slovenia, on the other hand, must face global public health problems and not just regional ones. This means that the PH of Slovenia must focus both on solving national PH problems, as well as participating in solving regional and global PH problems. Since PH professionals have to deal with all three levels, how can we even talk about separation between PH and GH?

The unity of the two concepts is also indicated by the fact that the challenges which PH and GH must address are the same. Let us mention just some of them, such as global drug routes, hunger and food security coming from all corners of the world, the warming of the planet and the climate changes associated with it, natural disasters of large proportions and migration, not to mention the globalization of social crises such as are wars. These conditions have a significant impact on the entire world. We are facing steadily growing health inequalities at all three levels. Thus, the problems are the same, only the scale and involvement of actors are different.

3 CONCLUSIONS

Due to cultural and socio-economic characteristics, it is necessary to adapt the field and the way of work to a specific local environment, but nevertheless, these are challenges that are present everywhere. That is why it is crucial that we act decisively, in a united and connected approach - regardless of where we live and at what level of social development we are. The world has become one, so the division into public health and global public health has become meaningless.

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RISK FACTORS ASSOCIATED WITH SEVERE SYSTEMIC ALLERGIC REACTION AFTER WASP STING IN SUBJECTS WITH A HISTORY OF EUROPEAN HORNET STING ALLERGY

DEJAVNIKI TVEGANJA, POVEZANI S TEŽKO SISTEMSKO ALERGIJSKO REAKCIJO (SAR) PO PIKU OSE PRI OPAZOVANCIH S SAR PO PIKU EVROPSKEGA SRŠENA V ANAMNEZI

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ABSTRACT

Aim: To make the treatment approach in patients suffering a European hornet sting allergy reaction more personalized, preparing them also for possible future risks.

Methods: In Slovenia an extended retrospective observational cohort epidemiological study about the natural history of Hymenoptera venom sensitivity is in progress. The study is based on data from the healthcare records of the University Clinic Golnik (UCG) and data collected by a questionnaire sent to patients from May 2019 to April 2021. For a pilot study, we selected patients who were referred to UCG because of an allergic reaction to European hornet sting and had been re-stung later by a wasp (n=68). The association between severe systemic allergic reactions (SSAR) after wasp sting and potential risk factors in subjects with a history of hornet sting allergy was assessed univariately using the likelihood ratio test.

Results: Among 68 European hornet allergic patients 27 reacted with an SSAR and 41 reacted with a mild SAR. Among 27 patients with SSAR, 4 reacted with an SSAR also to a subsequent wasp sting. Among 41 patients with a mild European hornet sting SAR nobody reacted with an SSAR to a subsequent wasp sting. The association between the severity of the wasp SAR reaction in European hornet allergic patients was statistically significant (p=0.022).

Conclusion: Our results suggest that patients with severe European hornet SAR should be considered for wasp venom immunotherapy or prophylactic prescription of epinephrine auto-injector as they are at risk for an SSAR also after wasp string.

Keywords:
Hymenoptera allergy
European hornet sting
Wasp sting
Severe systemic allergic reactions
Healthcare
Public health

IZVLEČEK

Namen: *Prilagoditi vodenje in zdravljenje bolnikov z alergijsko reakcijo po piku evropskega sršena in jih podučiti o morebitnih tveganjih ob naslednjem piku kožekrilca.*

Metode: *Na Univerzitetni kliniki za pljučne bolezni in alergijo, Golnik (UKG), Slovenija se izvaja obsežna opazovalna kohortna epidemiološka raziskava o naravnem poteku alergije po piku žuželk iz rodu Hymenoptera, ki temelji na podatkih iz podatkovne baze UKG in podatkov pridobljenih iz vprašalnika, ki se je pošiljal bolnikom od maja 2019 do aprila 2021. V pilotno študijo smo vključili tiste bolnike, ki so reagirali z alergijsko reakcijo po piku Evropskega sršena in jih je kasneje pičila osa (n = 68). Za oceno povezanosti med opazovanci s težko sistemsko alergijsko reakcijo (SSAR) po piku ose pri opazovancih z alergijsko reakcijo po piku evropskega sršena v anamnezi in potencialmi dejavniki tveganja smo uporabili univariatno statistično metodo.*

Rezultati: *68 bolnikov je imelo alergijsko reakcijo po piku evropskega sršena. 27 jih je reagiralo s težko SAR in 41 z blago. Med 27 bolniki s težko SAR po piku sršena, so 4 bolniki reagirali s težko SAR po kasnejšem piku ose. Med 41 bolniki, ki so po prvem piku Evropskega sršena reagirali z blago SAR, nihče ni reagiral s težko SAR po kasnejšem piku ose. Rezultati so pokazali močno povezanost med težko SAR po piku evropskega sršena in težavnostjo SAR po ponovnih pikih ose (p = 0,022).*

Zaključki: *Vodenje in zdravljenje bolnikov s težko SAR po piku Evropskega sršena naj vključuje imunoterapijo s strupom ose ali profilaktično nošenje avtoinjektorja z epinefrinom za samopomoč, kar je izjemnega pomena zaradi življenje ogrožajoče nevarnosti ob morebitnem piku ose.*

Ključne besede:
alergija po piku kožekrilcev
pik evropskega sršena
pik ose
težka sistemska alergijska reakcija
zdravstvena oskrba
javno zdravje

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1 INTRODUCTION

Insect venom allergy is the most common cause of anaphylaxis in adults. In Europe about two thirds of sting-induced anaphylaxis is due to stings of Vespidae family insects (1). The wasp (Vespula germanica) and European hornet (Vespa crabro) belong to the Vespidae family. Throughout Europe, the genus Vespula is more common than Vespa (2). Wasps behave more aggressively and enter the human environment to find food, so their stings are more common. In contrast to this, European hornets have eating habits that are not associated with a human lifestyle. Their behaviour is less aggressive, unless they are disturbed in the vicinity of their nests. However, their stings can be more health-threatening to humans than wasps' stings (3).

The molecular composition of both venoms is known in detail (4). The amount released in a wasp sting is much lower than in a European hornet sting. Wasps release 5-10 micrograms of venom per sting. The exact quantity of venom in a European hornet sting is not known. The dry weight of venom per sac in the European hornet was found to be 260 micrograms (5).
There is a marked cross-reactivity between wasp and European hornet venom. In fact, most of the genus Vespula allergens share a 95% homology in their amino acid sequence (6). As a consequence, diagnostic and therapeutic extracts also display a substantial cross-reactivity. The clinical relevance of this cross-reactivity is reflected in the fact that a patient primarily sensitized to wasp may experience an allergic reaction after being stung by a European hornet and vice versa, and further, a patient allergic to the latter can be adequately treated with wasp venom immunotherapy (VIT) (7).

Allergic reactions to Hymenoptera stings have varying levels of severity, being systemic (systemic allergic reaction – SAR) or local. This is not only true for the comparison between different individuals, as the grade of severity can also vary in each patient. About 1% of the population have anaphylactic reaction to Hymenoptera insect stings (8). The most important risk factor for severe insect sting anaphylaxis (anaphylactic shock or fatal/near fatal reactions), including malfunction of the respiratory system, is mast cell disease (mastocytosis or monoclonal mast cell activation syndrome). Other risk factors for severe SAR (SSAR) are older age, subsequent stings (after first SAR), a short interval (<2 months) between being re-stung, wasp or European hornet venom allergy (in contrast to honeybee venom allergy) and male gender, while the role of treatment with ACE inhibitors and beta blockers is debatable (9,10).

For patients who experienced a severe systemic IgE-mediated reaction to Hymenoptera sting, specific VIT is the therapy of choice (8). VIT has to be performed with culprit allergen after the sensitization is confirmed by positive skin test or specific IgE. Patients who experienced IgE-mediated reaction following the sting of a European hornet usually have positive skin tests and specific IgE to all vespid venoms (11), which means patients sensitised (and reacting) to vespid venom usually have positive tests to venoms of multiple vespid species, due to crossreactivity. According to data gained from the database of University Clinic Golnik (UCG) in Slovenia, about 280 new adult patients with systemic reaction after a Hymenoptera insect sting are examined every year.

This problem also has a public health dimension, especially in countries with a more spatially dispersed population such as Slovenia (12), which means a more rural population and thus greater exposure to Hymenoptera stings.

This study was launched with the aim of making the treatment approach in patients suffering a European hornet sting allergy more personalized, preparing them also for possible future risks. The objective was to at least roughly determine possible predictive factors for an SSAR after wasp sting in subjects with a history of European hornet sting allergy.

2 METHODS

2.1 Study design, study setting and time frame

In Slovenia an extended retrospective observational cohort epidemiological study about the natural history of Hymenoptera venom sensitivity is in progress. It is based on data from the healthcare records of the UCG and data collected by a questionnaire sent to patients from May 2019 to April 2021 (13). Initially a total of 3,689 patients were selected to enter the study. It was possible to deliver a questionnaire to 3,651 of them. Of these, 1,149 questionnaires were returned (response rate 31.5%), and 1,051 questionnaires were suitable for analysis. Among 1,015 respondents, 514 (48.9%) were referred due to allergic reaction after wasp sting, 410 (39.0%) due to honeybee allergic reaction, 103 (9.8%) due to European hornet allergic reaction and 24 (2.3%) due to both honeybee and wasp allergic reaction. For the purpose of this study, European hornet allergic patients re-stung by a wasp were selected.

2.2 Data collection process, study instruments and inclusion criteria

For the purpose of a pilot study, we selected patients who were referred to UCG because of an allergic reaction to European hornet sting and had been re-stung later by a wasp. Only patients who were not treated with VIT and who returned a postal or online version of the questionnaire were included.

From the healthcare records we obtained the age, sex, geographical location of the patient and the culprit insect of the first reaction of the sting as well as the clinical history of each patient: (i) aetiology of the first sting/stings, which was/were the cause of the allergy and admission to hospital, (ii) severity of the first SAR or large local reaction (LLR) (Mueller grading system), (iii) history of asthma, (iv) history of cardiovascular diseases, (v) atopic constitution (other allergies) and (vi) laboratory tests performed - sIgE for the bee venom and/or the wasp venom and/or the European hornet venom.

2.3 Observed outcome

The type of reaction and its severity after wasp sting which followed an allergic reaction to European hornet sting (Mueller grading system (14)) was assessed based on the question 'What were the signs of the allergic reaction', accompanied by a table explaining the signs of the subsequent allergic reaction. The patients could choose between five available answers from the table, which were converted into the severity of allergic reaction according to Mueller (from I to IV) or LLR. For the purpose of the analysis, we combined the answers into two categories: mild SAR after subsequent wasp sting reaction (Mueller grading system I and II) or LLR and SSAR after subsequent wasp sting reaction (Mueller III and Mueller IV). SSAR after wasp sting was chosen as the observed outcome (0-no, 1-yes).

2.4 Risk factors for severe SAR after wasp sting

For the purpose of analysis, all the variables were aggregated into two categories. Factors included in our analysis were socio-demographic: gender and age. The age of the patients was calculated from the year of birth until referral to the UCG for the assessment of the first European hornet sting and was aggregated into two categories (0 to 40 years old (0), 41+ years old (1)). Other factors associated with the type of reaction and its severity after a wasp sting that followed an allergic reaction to European hornet sting gained from the questionnaire or from the BIRPIS Hospital information system, were: carrying out farm work (0-no, 1-yes; questionnaire), type of living environment (0-rural, 1-urban; questionnaire), family history of Hymenoptera venom allergy (0-no, 1-yes; questionnaire), the time from visiting UCG to the next sting (0-2 years (0), >3 years (1); questionnaire), having asthma (0-no, 1-yes; BIRPIS Hospital information system), having other diseases (0-no, 1-yes; BIRPIS Hospital information system), concentration sIgE (<0.35-low, 0.36 to 3.49-moderate, >3.50-high (15), Hospital information system).

2.5 Methods of analysis

The association between SSAR after wasp sting and potential risk factors in subjects with a history of hornet sting allergy was assessed univariately using the likelihood ratio test.
In all statistical tests, $p \leq 0.05$ was considered significant. The IBM SPSS for Windows Version 27.0 (SPSS Inc., Chicago, IL, USA) software was used.

3 RESULTS

3.1 Sample description

The final sample included 68 European hornet allergic patients re-stung by a wasp, 50 (73.5%) men and 18 (26.5%) women. The majority of them were 41 years old or older (52.9%).

3.2 Results of the association analysis

There were 27/68 patients with an SSAR after a European hornet sting. Four (14.8%) of them reacted with an SSAR also to a subsequent wasp sting. One the other hand there were 41 patients with a mild European hornet sting allergic reaction and nobody reacted with an SSAR after a subsequent wasp sting (Table 1). The association between the severity of the wasp SAR reaction in European hornet allergic patients was statistically significant ($p=0.022$). This means that those who experience severe allergic reaction after a European hornet sting are more prone to react severely (Mueller grading system III or IV) after a subsequent wasp sting.

When considering other risk factors for the severity of the wasp SAR in European hornet sting allergic patients, none was statistically significantly associated with the observed outcome (Table 1). This means there were no associations between the severity of wasp sting reaction according to age, sex, farm work, living in a rural or urban area, Hymenoptera allergy in the family, the time of the next sting, having asthma or other diseases.

4 DISCUSSION

The results of our study suggest that a severe SAR after a European hornet sting can serve as a useful indicator that these patients might react with a severe SAR after a subsequent wasp sting. Among 103 patients referred due to allergic reaction after a European hornet sting, 66% self-reported being re-stung by a wasp, which is a very high prevalence. This indication is very important as management and treatment of the patient, which consist of wasp VIT or carrying of epinephrine autoinjection (EAI) for self-administrations, is of utmost importance to prevent severe reaction or even save their lives in the case of a possible subsequent wasp sting.

Table 1. Results of analysis of association between severe SAR after a wasp sting in hornet sting allergic patients and selected risk.

Risk factor for SSAR after a wasp sting	Category	N_{tot}	N_{hornet}/N_{cat} (%)	p
Severe SAR after European hornet sting	No	68	0/41 (0.0%)	0.005
	Yes		4/27 (14.8%)	
Gender	Female	68	1/18 (5.6%)	0.945
	Male		3/50 (6.0%)	
Age	0-40	65	3/29 (10.3%)	0.203
	41+		1/36 (2.8%)	
Carrying out farm work	No	68	2/34 (5.9%)	1.000
	Yes		2/34 (5.9%)	
Type of living environment	Rural	68	2/45 (4.4%)	0.492
	Urban		2/23 (8.7%)	
Family history of Hymenoptera allergy	No	68	3/53 (5.7%)	0.885
	Yes		1/15 (6.7%)	
Time between two stings	0-2 years	68	0/25 (0.0%)	0.051
	>3 years		4/43 (9.3%)	
History of asthma	No	68	4/67 (6.0%)	0.727
	Yes		0/1 (0.0%)	
Accompanying diseases	No	68	4/60 (6.7%)	0.309
	Yes		0/8 (0.0%)	
Concentrations of sIgE	Low	68	1/7 (14.3%)	0.646
	Moderate		2/35 (5.7%)	
	High		1/26 (3.8%)	

Legend:
N_{tot}=total number of observations, N_{hornet}=number of subjects with severe European hornet systemic allergic reaction within the category; Ncat=number of subjects within the category; SSAR=severe systemic allergic reaction; concentrations of sIgE=<0.35-low, from 0.36 to 3.49-moderate, >3.50-high (15).

In the literature reporting on patients who experienced an SSAR after a hornet sting and were not treated with VIT, real-world evidence data about the course of the disease is scarce. Košnik et al. identified that wasp venom induces sensitization in the majority of patients with IgE-mediated allergic reaction to the venom from the sting of a European hornet. The data demonstrate that in Slovenia, the vast majority of patients with anaphylactic reaction to European hornet sting seem to be sensitized through previous wasp stings. Wasp venom was considered an appropriate immunotherapeutic agent for such patients, except for those with proven primary sensitization to specific epitopes of European hornet venom (16). Macchia et al. assessed in a prospective way the characteristics of re-stings and showed that in European hornet allergic patients both wasp and European hornet VIT are equally effective (17). Eržen et al. showed that patients with European hornet allergy and high basophil sensitivity (BAT) after stimulation with wasp venom are also at risk of developing a systemic reaction after a wasp sting. On the contrary, patients with low basophil sensitivity are likely to tolerate further wasp stings without an SAR. The BAT proved to be a helpful additional tool because of its high sensitivity and specificity, and it has predictive value for the severity of the reaction (18). In patients with low basophil sensitivity to wasp venom and considering the low probability of further European hornet stings in the general population in Central Europe, those patients could be offered a more personalized management plan and follow-up (19).

Risk factors associated with the severity of the SAR after subsequent stings are mainly described for wasp and honey bee stings, and are as follows: gender, age, beekeeping

or living next to a beehive, farm work, living in a rural area, genetic predisposition, the time from the first SAR to the next sting, asthma and other diseases, especially cardiovascular diseases. The results of our analyses show there is no association between selected risk factors and the severity of the SAR after a subsequent wasp sting in European hornet allergic patients.

The prevalence of SARs is generally higher for men than for women. Men are more exposed (outdoor workers, physical activity) and consequently experience a higher number of stings, and might therefore be at a higher risk for sensitization (9). Adults are more likely to have severe SARs after re-stings than children, and older adults (41+years old) have more severe SARs after being re-stung, which is related to comorbidity, especially the presence of cardiovascular diseases (20). As far as farm work is concerned, we presume that those engaged in this kind of work are more exposed to European hornet stings, because of their living habits. Like other social wasps, European hornets build communal nests by chewing wood to make a papery pulp, and are found mostly in rural areas (3). Epidemiological studies that have assessed sensitization to insect venom and atopy, which is the most well-known genetic factor, suggest causality. Data on the association between rhinitis, ocular symptoms, allergic asthma and insect sensitization is common. Atopic subjects have a lower threshold in skin tests with insect venoms and a higher level of sIgE than non-atopic patients (21). Genetic predisposition increased the risk of sIgE formation in atopic patients and in patients who have a history of allergic reaction to Hymenoptera stings in the family (22). Among other diseases which could possibly increase the severity of SAR after wasp stings, cardiovascular are the most important. In particular, these include medications for cardiovascular diseases (beta-blockers and ACE inhibitors) but to date not enough evidence-based studies on this topic have been published (9,10). As far as the time between first and subsequent Hymenoptera sting is concerned, the absence of further stings can lead to tolerance. Persistent sensitization with no intermediate stings is likely to involve genetic factors, but the cause of persistence of sIgE has yet to be explained (23).

Our study has some potential limitations. First, the data were collected in a self-reported survey, and thus the actual data in the whole cohort could be different. Greater control over the questionnaire results can be achieved with the supervision of an allergist. For these reasons, the data from the hospital information system of individual histories was extremely important in our study, as we had access to everyone's history concerning the characteristics of individual health status and of the first sting. Next, the number of patients who experienced an SSAR after a hornet sting and were subsequently stung by a wasp and had no VIT is very small, particularly patients with a European hornet sting SSAR. Next, our study included only patients without VIT. This means that most of the patients reacted with a mild SAR (Mueller grade I or II) or even with LLR after a European hornet sting. For some patients in our study group who reacted severely, VIT was advised. They refuse it for different reasons: not trusting the results of specific immunotherapy treatment, the distance to the clinic where treatment is provided, job commitments, not having time for other reasons and poverty. Through the protocol these patients are protected with an epinephrine auto-injector (EAI) (24). Finally, as there is no available literature about risk factors that could increase the severity of the SAR explicitly for European hornet, thus we could only presume these risk factors are similar to those from being stung by a wasp or honey bee.

This study has also some strengths. First, to the best of our knowledge this is the first assessment of possible risk factors for SSAR after a wasp sting in European hornet allergic patients. Next, the survey addresses multiple variables in one unique study, which is not usual for the retrospective studies already conducted in this field (16-18). Next, the study population covered all Slovenian patients referred to the hospital due to allergic reaction after Hymenoptera stings from 1997 to 2015, as the UCG was the only institution in Slovenia that covered diagnostic procedures and the treatment of this kind of allergy in adults. Finally, this study was a very long-lasting retrospective study.

This study has some important clinical as well as public health implications. Among the clinical implications, it is worth first mentioning that the study results indicated a strong association between an SSAR after a European hornet sting and severity of allergic reaction after a subsequent wasp sting. Management and treatment of patients with an SSAR after European hornet sting could be personalized using this knowledge. For example, this knowledge could be used in empowerment of such patients regarding the necessity of VIT or EAI use after structured training on how to use this kit, and other precaution measures (9). From a public health perspective, the results of our study can be very important in educating and empowering population groups that are at risk for Hymenoptera mites, such as children, adolescents and beekeepers (25, 26).

We are aware that this is only the beginning of research in this field. Although we showed that 15% of patients with severe European hornet allergic reaction will react with severe reaction also after a wasp sting, further studies are needed to identify biomarkers that could find those patients at risk. For example, BAT sensitivity which looks like a promising biomarker to predict the risk of severe reaction after a subsequent wasp sting should be measured.

5 CONCLUSIONS

The results of our study showed that an SSAR after a hornet sting is one of the risk factors for subsequent SSAR also after a wasp sting. They suggest that patients with an SSAR after a European hornet sting should be considered for wasp VIT or prophylactic prescription of EAI, as they are at risk for an SSAR also after a wasp sting. The awareness of this kind of possible treatment among healthcare providers, patients and the general public as well, should be improved in all steps in the procedures towards a healthier, better quality of life or even protection of their lives.

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CONFLICT OF INTERESTS

The authors declare that no conflicts of interest exist.

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ETHICAL APPROVAL

Ethical approval to conduct the study was obtained from the National Medical Ethics Committee of the Republic of Slovenia (NMEC), No. 0120-188/2017/4, Academic research.

AVAILABILITY OF DATA AND MATERIALS

All data and materials used in this study are available upon reasonable request of the corresponding author.

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UNMET NEEDS IN THE PROCESS OF CHEMOTHERAPY PROVISION IN PANCREATIC CANCER PATIENTS FROM THE HEALTHCARE PROVIDER PERSPECTIVE: A PHENOMENOLOGICAL STUDY IN GREECE

NEIZPOLNJENE POTREBE V PROCESU ZAGOTAVLJANJA KEMOTERAPIJE PRI BOLNIKIH Z RAKOM TREBUŠNE SLINAVKE Z VIDIKA IZVAJALCEV ZDRAVSTVENEGA VARSTVA: FENOMENOLOŠKA ŠTUDIJA V GRČIJI

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ABSTRACT

Introduction: Pancreatic cancer is the fourth leading cause of cancer death overall, with 1.5 years life expectancy and minimal therapeutic progress in the last decades. Despite the burden it causes, there is little research on the needs of this specific population. This study aimed to explore healthcare professionals' views on providing care and patients' unsatisfied needs.

Methods: This qualitative descriptive study was carried out at a cancer hospital in Northern Greece. A total of 12 participants (6 physicians and 6 nurses), treating patients with pancreatic cancer undergoing chemotherapy, were recruited through purposive sampling and underwent face-to-face semi-structured interviews. Data were analyzed through the thematic analysis method in NVivo12 software.

Results: The analysis highlighted two themes: "needs of patients with pancreatic cancer" consisted of 6 subthemes ("daily activities", "symptoms management", "psychological support", "information needs", "multidisciplinary care" and "end-of-life care") and "needs of healthcare professionals" had 3 subthemes ("psychological support", "education" and "organizational support"). Several symptoms are identified and affect the daily activities of these patients, and psychological support is important for the majority of them, even at the time of diagnosis. The participants express dissatisfaction with the absence of palliative care structures and services and stated that an interdisciplinary approach would improve the quality of care.

Conclusions: Healthcare professionals report a wide range of unsatisfied needs of patients with pancreatic cancer, with the majority expressing their concerns about the complete lack of patient support in the last stages of their lives.

Keywords:
Pancreatic cancer
End-of-life care
Unmet needs
Holistic care

IZVLEČEK

Uvod: *Rak trebušne slinavke je četrti najpogostejši vzrok smrti zaradi raka. Pričakovana življenjska doba bolnikov z rakom trebušne slinavke je 1,5 leta, terapevtski napredek v zadnjih desetletjih pa je skromen. Kljub bremenu, ki ga povzroča, je zelo malo raziskav o potrebah te specifične populacije. Cilj te študije je proučiti mnenja zdravstvenih delavcev o zagotavljanju oskrbe in neizpolnjenih potrebah bolnikov.*

Metode: *Ta kvalitativna deskriptivna študija je bila izvedena v bolnišnici za zdravljenje raka v severni Grčiji. V njej je sodelovalo 12 zdravstvenih delavcev (6 zdravnikov in 6 medicinskih sester), ki so s kemoterapijo zdravili bolnike z rakom trebušne slinavke. Sodelujoči so bili izbrani z namenskim vzorčenjem, z njimi pa so bili opravljeni osebni polstrukturirani intervjuji. Podatki so bili analizirani z metodo tematske analize v programski opremi NVivo12.*

Rezultati: *Pri analizi sta bili izpostavljeni dve temi: tema »potrebe bolnikov z rakom trebušne slinavke« s 6 podtemami (»vsakodnevne dejavnosti«, »simptomatsko zdravljenje«, »psihološka podpora«, »potrebe po informacijah«, »multidisciplinarna oskrba« in »oskrba ob koncu življenja«) in tema »potrebe zdravstvenih delavcev« s 3 podtemami (»psihološka podpora«, »izobraževanje« in »organizacijska podpora«). Ugotovljenih je bilo več simptomov, ki vplivajo na vsakodnevne dejavnosti teh bolnikov, za večino teh simptomov pa je pomembna psihološka podpora, celo v času diagnoze. Udeleženci so izrazili nezadovoljstvo zaradi pomanjkanja struktur in storitev paliativne oskrbe ter navedli, da bi interdisciplinarni pristop izboljšal kakovost oskrbe.*

Zaključki: *Zdravstveni delavci navajajo številne neizpolnjene potrebe bolnikov z rakom trebušne slinavke, večina pa je zaskrbljenih zaradi tega, ker bolniki ob koncu življenja ne prejmejo nobene podpore.*

Ključne besede:
rak trebušne slinavke
oskrba ob koncu življenja
neizpolnjene potrebe
celostna oskrba

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1 INTRODUCTION

Pancreatic cancer (PC) is a significant global and Greek public health challenge. It is the 9th cause of death in Greece (1) and the 7th most fatal cancer worldwide, with approximately 466,003 deaths in 2020 (2) and only a 3% five-year relative survival rate for patients with metastasis (3). There are usually no symptoms in the early stages of the disease and when they appear the disease has spread to other parts of the body with a poor prognosis and limited treatment options (4).

The main signs and symptoms are jaundice, abdominal or back pain, unexplained weight loss, light-colored stools, dark urine, and loss of appetite (5). Cachexia and sarcopenia are the two most common problems, which limit the ability to perform daily activities, are associated with poor overall survival and reduce patients' quality of life (QOL) (6). Disease progression is rapid and the burden is enormous, suggesting that early palliative support is needed to improve QOL and symptom management (7), especially for patients under chemotherapy.

Cancer is a multidimensional disease, with millions of incidences globally and increasing challenges to health systems. Various issues related to deficiencies in cancer care have been repeatedly discussed in the literature, with the most frequently being the unmet needs of psychosocial support, multidisciplinary cooperation, patient-doctor communication and palliative care systems (8–10).

Greece provides free health services to all citizens in public structures (11), however, due to shortages and delays, especially in primary healthcare, patients have many unmet needs and as a consequence, many of them turn to the private sector for care (11). Across the country, there are specialized public and also private cancer hospitals and oncology clinics, but Greece belongs to the countries characterized by a very small number of hospices and palliative care services, which are usually provided by non-governmental organizations in outpatient facilities and at-home and are limited compared to the country's population (12). In this context, cancer patients are not adequately supported.

Despite the plethora of research into cancer treatments, there is little research on the specific needs of patients with PC and fewer on the views of healthcare professionals (HCPs) on this issue. To improve the quality of health services, HCPs and patients must openly discuss their wishes, needs and care options (9). Their experience is important and can shed light on unseen aspects of care deficits (10). Earlier studies have investigated HCPs' views on the supportive care needs of patients with advanced cancers such as colorectal or prostate, and others on the prevalence, barriers and psychosocial issues in cancer care (13). To the best of our knowledge, there is no study about the supportive care needs of PC from HCPs' perspective in Greece.

Aimed at preparing the basis for improvement of the chemotherapy process in patients with PC, the objective of the present study was to explore the perception of unmet needs of patients as well as of those of healthcare providers during the provision of chemotherapy from the perspective of HCPs.

2 METHODS

2.1 Study design, time frame and setting

The study we present is designed as a phenomenological study that is part of broader research that explores the needs of PC patients in the light of HCPs, patients and their informal caregivers. The first study concerns the perspective of HCPs – oncologists and oncology nurses. The study was carried out in the only cancer hospital in Northern Greece in May and June of 2019.

2.2 Participants and Sampling

The study included participants who have dealt with a variety of patients with PC and have gained significant experience in this field – participants from a specialized hospital who treat a considerable number of PC patients yearly.

The inclusion criteria for HCPs were a) working in a department treating PC patients undergoing chemotherapy, b) having at least one year of experience in the department, and c) being a physician or nurse. A purposive sample strategy of maximum variation (variables: gender, age, and work experience) was used to capture the widest range of possible perspectives.

2.3 Data collection

Semi-structured, face-to-face, in-depth interviews were conducted, recorded and saved in mp3 format. Each participant was interviewed one time, in a quiet room of the hospital, without the presence of other people, at a preselected time that the participant had chosen. We preferred this method to focus groups because it is easier to recruit participants to commit to an interview rather than a focus group and they may feel safer expressing themselves when they are alone. The recruiter and interviewer were the first author, a PhD candidate trained in qualitative research, and a female oncology nurse with 13 years of experience. The interviewer worked in the same hospital as the participants but in a different ward and did not have personal relationships with them. The interview guide was pilot-tested on two HCPs to ensure clarity, and all the necessary adjustments were made.

Table 1. Interview topic guide.

Topic heading	Issues discussed
Opening	Study purpose
Exploration of topics	Confidentiality Data management General thoughts about pancreatic cancer Symptoms Daily activities Psychology Support Healthcare professional-patient communication Quality of care Coordination and organization of care
Ending	Summarisation (from the interviewer) Feedback on completeness Further comments

2.4 Data analysis

Interviews were transcribed verbatim from mp3 format to MS WORD. The qualitative inductive thematic analysis proposed by Braun and Clarke (14) was the initial method and was performed with the software NVIVO12, by two researchers (first and second author) separately to gain a common understanding of the HCPs' perspectives and to enhance the validity of the results. For better results, we analyzed all the collected data and searched for negative or deviant cases that could improve the overall results. Disagreements on the categorization of subjects were resolved after discussion among them. Recruitment stopped when theoretical saturation was accomplished and interviews did not offer new concepts or contribute to what already exists. The authors' team decided on theoretical saturation after discussion.

2.4 Ethics

All the participants were informed in advance about the study aim, content and procedure with a leaflet and signed consent for their participation. There was a clear statement that there would be no reward for their participation and that they could withdraw at any time. Sixteen HCPs were initially interested in participating, one nurse was excluded and finally, 12 were interviewed until saturation was reached. Participants received an identification code so that their personal data could remain protected throughout the study.

2.5 Rigour

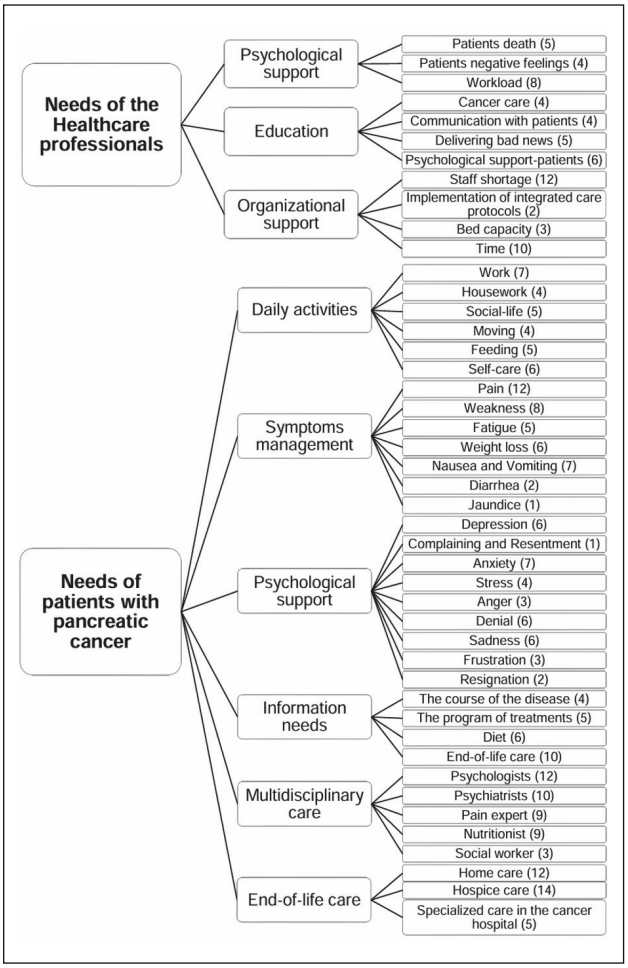
Consolidated Criteria for Reporting Qualitative Research Guidelines were used in this study to improve rigour, and participants and the context in which data was collected was fully described to enhance transferability. Credibility was enhanced by the first author who was familiar with the field, as an oncology nurse and doctoral student with training in qualitative research. The use of the same recording method and questions in all the interviews was for dependability. The second author and analyst was also an experienced researcher in qualitative research, a female psychologist, but has no relationship with the issue of cancer care or the setting of the cancer hospital. Lastly, at the end of the interview, the interviewer summarised the collected data, and requested the HCPs to give feedback about the accuracy of the information gathered and add anything considered important that had not been mentioned.

3 RESULTS

Twelve HCPs participated, with an average duration of interviews being 26:10 minutes for the physicians and 32:50 for the nurses. The descriptive characteristics of participants are presented in Table 2. The results of the thematic analysis presented in Figure 1 highlighted two themes, "needs of patients with pancreatic cancer" and "needs of healthcare professionals". The first theme consisted of six subthemes: "daily activities", "symptoms management", "psychological support", "information needs", " multidisciplinary care" and "end-of-life care". The theme "needs of healthcare professionals" consisted of three subthemes, "psychological support", "education" and "organizational support" which did not belong to the design of the study, but emerged from the inductive analysis of the interviews. Participants particularly emphasized the specific topic and therefore it was included in the presentation of the results.

Table 2. Descriptive characteristics of participants.

Number of Participants/Range	6 Physicians	6 Nurses
Gender		
Men	3	0
Women	3	6
Age (Range: years)	30-45	45-53
Education		
Bachelor (Medical School Vs Nursing School)	5	6
Master	0	0
Doctoral	1	0
Work experience (mean: years)	9	15
Number of treated patients with pancreatic cancer		
<100	2	2
100-200	4	3
>200	0	1



Note: Within each code cell the number of quotes analyzed is written in parentheses

Figure 1. Thematic map.

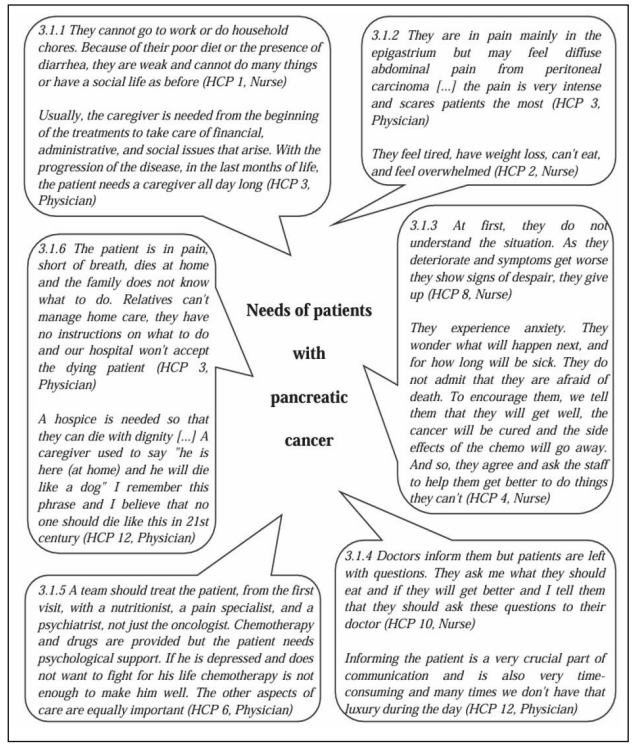


Figure 2. Illustrative quotes of "Needs of patients with pancreatic cancer".

3.1 Needs of patients with pancreatic cancer

HCPs understand the complexity of PC and the burden it causes on patients. The first thought common to all was that this type of cancer is associated with a short and painful path, which in the vast majority ends in death. Figure 2 captures illustrative quotes for every subtheme.

3.1.1 Daily activities

At the time of diagnosis, patients most often present with advanced disease that has already affected their daily activities. They usually interrupt their work and operate more conservatively during the day. In most cases, their clinical condition improves for a couple of months after the start of chemotherapy, but quickly recedes and follows a rapidly declining course. During the period of improvement, their functionality increases, which allows them to perform efficiently in their daily life. The improvement lasts a very short time and after that patients can neither work nor be self-sufficient. They need help with all day-to-day activities and this makes them feel sad, isolated and disadvantaged.

The support they receive from informal caregivers in various areas of their daily life is emphasized. This assistance concerns issues of transportation, communication with HCPs, housework, personal care, etc. The assistance of family members is considered especially important in the final stage of the disease where the patients lose much of their functionality and cannot even perform daily self-care activities such as walking, hygiene and eating.

3.1.2 Symptoms management

Pain, fatigue and weight loss are the predominant symptoms experienced by these patients at all stages of the disease and the main concern for relief by HCPs. In fact, for the particular symptom of pain, there is frequent collaboration with a specialist within the hospital. In addition, these patients often have symptoms of weakness, feeding difficulties, nausea and vomiting, diarrhea and jaundice.

3.1.3 Psychological support

HCPs recognize several psychological symptoms that are related to and affect the daily activities and consequently the QOL of these patients. Depression, anxiety, stress, complaining, resentment, anger, denial, sadness,

frustration and resignation are present in the majority of patients and sometimes even from the time of diagnosis. These symptoms are recognized by HCPs but are often not perceived by patients and their family members and therefore they do not ask for psychological support.

3.1.4 Information needs

All participants agree that patients should be well informed but the information they receive is not enough. Specifically, it was mentioned that patients seek more information about the course of the disease, the programme of treatments, nutritional advice, and end-of-life care. Lack of time, doctors' difficulty in communicating unpleasant information, and also the wishes of their family, especially if the patient is elderly and the family takes all the responsibility for the care, are the main reasons why patients are not fully informed.

3.1.5 Multidisciplinary care

Except for physicians and nurses, several other HCP specialties should be included in the context of holistic care. Earlier in this paper there was a reported need for psychologists, psychiatrists, and physicians experts in pain management. Also, they experience symptoms of malnutrition and cachexia for which the presence of a nutritionist is considered important to guide and follow up with the patient from the moment of diagnosis until the end. Finally, many patients need support from social workers to resolve financial and insurance issues arising from the disease.

3.1.6 End-of-life care

HCPs expressed their dissatisfaction with the lack of palliative care structures throughout the country, especially in the final stage of the disease, where the unmet needs of patients are maximized. They report that the terminally ill patient needs home care or specialized structures such as hospice. The priority of the cancer hospital and tertiary hospitals is to support patients with the prospect of a cure because hospital beds are limited. In the final stage, there are specific needs that cannot be served there. On the other hand, public health workers cannot urge and direct patients to private providers of home care and palliative care services because they find it unethical or because patients have financial hardship. All the respondents state that there is no support for these patients in or out of the hospital, and that is very frustrating.

3.2 Needs of the healthcare professionals

The majority of HCPs state that they are not satisfied with the health system in which they work, and consider that it does not meet the needs of these patients. The only positive element of the system is the free service provision and the loyalty of the workers, but they find no other positive elements, emphasizing the issues discussed below. Figure 3 captures illustrative quotes for every subtheme.

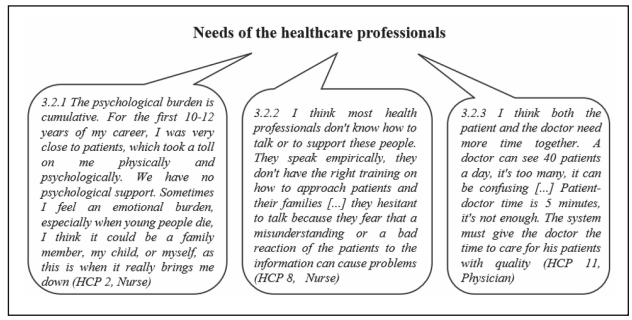


Figure 3. Illustrative quotes of "Needs of the healthcare professionals".

3.2.1 Psychological support

Participants report that they need psychological support for several reasons that affect negatively their psychology and performance. Firstly, they are adversely affected by the increased mortality of these patients, especially when young patients die. Secondly, they face their patients' anger, frustration, anxiety and denial and lastly, they feel pressured to provide optimal care to their patients in understaffed conditions.

3.2.2 Education

Half of the participants found it important to report that they are not trained and feel insecure about informing or supporting patients. This insecurity concerns issues of cancer care, the announcement of the diagnosis or the progression of the disease, but also psychological support from the moment of diagnosis until the end.

3.2.3 Organizational support

Staff shortages are known to be a problem that negatively affects the provision of quality patient care. Specialized HCPs such as psychologists and psychiatrists are almost absent, and the majority of responders mentioned the need for more physicians and nurses. Implementing integrated care protocols and increasing bed capacity will increase the quality of providing services and decrease patients' discomfort. HCPs believe that they need more time to treat and inform their patients sufficiently because everything is done in a hurry and in the wrong way and this dissatisfies them.

4 DISCUSSION

In the findings of the present study, HCPs support the fact that patients with PC experience unmet needs in the areas of daily living, psychological support, end-of-life care, symptoms management, information and care by a multidisciplinary team. Also, HCPs need psychological and organizational support, as well as training to cope with the tasks of caring for their patients. These findings are interconnected and indicate that patients and HCPs experience needs that negatively affect the QOL of patients and the quality of care respectively. Although a growing literature addresses these research questions for various types of cancer or advanced cancer stages, there is a lack of research data supporting similar beliefs of HCPs related solely to PC.

In previous quantitative studies of PC, patients experience daily needs of at least 50%, which are maximized in the final stage of the disease, when patients lose their functionality (15). They are particularly vulnerable and have many unique needs during treatments, as they reported the worst physical well-being scores compared to survivors of other malignancies and people without cancer (16).

Pain, fatigue and severe weight loss/cachexia are the predominant symptoms in our study, but other symptoms of indigestion, dry mouth and altered bowel activity are described in the relevant literature (17). Very few studies examined the influence of PC on spiritual and sexual QOL (18), while no reference has been made to our study. Sociability problems have been investigated but have not been concluded if they are more pronounced than other types of cancer, although they are higher than in the general population (17).

Physical needs in PC patients with pain, fatigue, pancreatic enzyme deficiency and nutritional problems require early detection and a multidisciplinary approach (19). Generally, a multidisciplinary approach to symptom management and psychosocial support improves patients' QOL and avoids errors in decision-making (20), while in cancer care shows positive effects on patient satisfaction, cost of care and symptom relief (21). HCPs in our study agreed that a multidisciplinary approach is interconnected with holistic care, improving the quality of care for patients with poor physical and psychological well-being scores.

Psychological support is crucial for cancer patients, especially in gastrointestinal cancers, where psychopathology rates are higher (22), subclinical symptoms of depression and anxiety range from 12% to 78%, and patients show unsatisfied needs in this sector (23). Poor oncologist accuracy on subclinical symptoms (24) contradicts the importance of psychological support, as all participants in our study recognize it as being just as crucial as the other aspects of treatment.

Proper communication is also crucial for cancer patients to ensure compliance with recommended treatments (9). Clinicians face challenges in disclosing complex information, especially in advanced cancer patients related to unrealistic patient expectations, and trying to explain in simple terms the treatment options and side effects (25). A systematic review suggests that patients and caregivers need honesty, compassion and patience throughout the communication process (26) with cultural differences affecting successful communication, as families of Chinese, Arab and Greek patients intervene and guide doctors on the information they give to patients (27). This is supported in societies with strong family bonds, which oblige the family to undertake disease management for the patient, and is also in agreement with the findings of the present study.

Literature suggests that the severity of symptoms affects the prognosis and survival of these patients (28), but high-quality palliative care is often unavailable. End-of-life care is crucial for PC patients, and hospice services can help manage symptoms and improve QOL (7). However, evidence shows that aggressive care (chemotherapy, hospitalizations and intensive care unit admissions) in the last days of life has increased in recent years (29), and many patients do not receive hospice care, resulting in missed benefits and support (7).

The work environment lacks adequate structural conditions, human resources, time, space, and control, which leads to dissatisfaction among HCPs. Oncology staff, especially oncologists and nurses, need psychological support because they often experience stress and burnout due to the complex work environment with cancer patients, in which they have to deal with the concept of death and patient/family pain and receive complex moral decisions (30). Clinicians also need training to communicate and inform patients properly, and to support this, guidelines and recommendations have been published and workshops have been established to develop communication skills (31). However, nurses need more money and time to attend training programmes to improve their performance (32). All of the above improvements are important because insufficient or incorrect knowledge of disease management can lead to a deterioration of care (10, 25, 31).

Greece has not made significant progress in palliative care, but plans to develop it are underway (12). Two new pieces of legislation on palliative care (Law 5007/2022) and home care (Ministerial Decision 3396/B/2023) have recently been published by the state but have not yet been implemented. The fact that HCPs in our study did not refer to the contribution of primary health care to the QOL of cancer patients indicates the lack of coordination between health structures in Greece. The assessment of patients' healthcare needs is essential for effective treatment,

but it requires multidisciplinary and interdisciplinary collaboration, with the active participation of patients (33). A limitation of the present study is that HCPs from one cancer hospital are not representative of all hospitals in Greece, but it was chosen because it is the only hospital with extensive experience in PC in northern Greece. Thus, the purposive maximum variation of the sample was used to gain transferability. Another limitation is the absence of inter-rater reliability, that the transcripts did not return to the participants to provide feedback, but at the end of the interview, the interviewer summarized the collected data and requested the HCPs to state their opinion about the accuracy of the gathered information. The researcher's presence during the interviews could affect the subjects' responses and for that reason, the interviewer did not have personal relationships with the interviewees. Finally, triangulation will emerge when the study is completed with the findings from patients, informal caregivers and HCPs, but cannot be supported by the preliminary results of this part of the study.

A pilot study on the needs of patients and caregivers requiring palliative care and the capabilities of primary healthcare professionals in Slovenia was recently published (34). Such research would be useful to be carried out in Greece to help create the most suitable infrastructures for the care of these patients and in this context, the knowledge of the perceptions of HPCs which emerged from the present study, can be seen as important revealing information that is apparent only from their side.

5 CONCLUSION

The findings of the views of HCPs in PC indicate many unmet patient needs, highlighting the absence of palliative care and multidisciplinary collaboration from the beginning of treatment, which has an immeasurable cost on patients' QOL and is consistent with previous studies (12, 15, 35). Even if new, more effective treatments improve QOL in terms of pain relief or increase patients' survival time, the invaluable and irreplaceable value of human care, both between patients and HCPs and between professionals, should not be underestimated. The obvious impact on a professional, financial and existential level makes it an immediate priority to strengthen palliative care and multidisciplinary teams that assess all stages of treatment.

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CONFLICTS OF INTEREST

The authors declare that no conflicts of interest exist

FUNDING

The authors declare that they received no funding

ETHICAL APPROVAL

The study was performed in accordance with the Helsinki Declaration and approved by the Aristotle University of Thessaloniki Ethics Committee (Ref. 3.132/2-5-2018) and the 4th Regional Unit of Greece (Ref. 17.746/14-11-2017).

AVAILABILITY OF DATA AND MATERIALS

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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EFFECTIVENESS OF NUTRITIONAL INTERVENTION LED BY CLINICAL DIETITIAN IN PATIENTS AT RISK OF MALNUTRITION AT THE PRIMARY HEALTHCARE LEVEL IN SLOVENIA - EVALUATION STUDY

UČINKOVITOST PREHRANSKIH UKREPOV KLINIČNEGA DIETETIKA V OBRAVNAVI PREHRANSKO OGROŽENIH PACIENTOV NA PRIMARNI RAVNI ZDRAVSTVENEGA VARSTVA V SLOVENIJI – EVALVACIJSKA RAZISKAVA

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ABSTRACT

Introduction: Clinical dietitians play a crucial role in the nutritional support of patients at risk of malnutrition in primary care settings. The study aimed to evaluate the effect of an individualized nutritional intervention on clinically relevant outcomes for patients with chronic disease at nutritional risk.

Methods: A longitudinal evaluation study was conducted in two Slovenian primary health centres. We used pre-test and post-test design. Patients with chronic disease were screened using the Malnutrition Universal Screening Tool and additional risk factors (≥70 years and BMI <22 kg/m^2; lower food intake in the last five days). Patients at nutritional risk were referred to a clinical dietitian for individual nutritional intervention. The effect of the nutritional intervention was assessed six months after the patients' first visit with a clinical dietitian.

Results: The sample included 94 patients. Nutritional risk was reduced significantly in high-risk and moderate-risk patients. In a subgroup of patients with a MUST score ≥1 (77 patients), body weight, BMI, Fat-Free Mass Index (FFMI), energy intake, and protein intake increased significantly (p<0.001). At the same time, the phase angle significantly increased (p<0.001), but there were no statistically significant changes in the improvement of grip strength. In a subgroup of patients with MUST score 0 (17 patients), we observed an increase in their median daily energy intake (p<0.001) and median protein intake (p=0.003).

Conclusion: Nutritional intervention delivered by a clinical dietitian improved patients' nutritional intake and nutritional and functional status.

Keywords:
Nutritional screening
Nutritional assessment
Chronic diseases
Nutritional care
Primary care
Anthropometric measurements
Clinical dietitians

IZVLEČEK

Namen: *Preveriti učinkovitost individualnih prehranskih ukrepov, ki jih v obravnavi prehransko ogroženih pacientov s kronično boleznijo, načrtuje in izvaja klinični dietetik ter se odražajo v spremembah prehranskega in funkcionalnega stanja pacientov.*

Metode: *Longitudinalno evalvacijsko raziskavo smo med majem 2020 in novembrom 2022 izvedli v dveh večjih slovenskih zdravstvenih domovih. Prehransko presejanje smo izvedli z uporabo univerzalnega orodja za prehransko presejanje Malnutrition Universal Screening Toll (MUST) in dodatnimi dejavniki tveganja (≥ 70 let in ITM < 22 kg/m^2; manjši vnos hrane v zadnjih petih dneh). Prehransko ogrožene paciente smo napotili h kliničnemu dietetiku na individualno prehransko obravnavo. Skupino pacientov smo spremljali v dveh različnih časovnih točkah, uporabili smo dizajn pred postopkom/po postopku. Rezultate smo analizirali po šestih mesecih.*

Rezultati: *V vzorec smo vključili 94 bolnikov. Prehranska ogroženost se je pri pacientih z visokim in zmernim tveganjem po šestih mesecih znatno zmanjšala. V podskupini pacientov z oceno MUST ≥ 1 (77 pacientov) so se telesna masa, indeks telesne mase, indeks puste mase, količina zaužite energije in količina zaužitih beljakovin znatno povečali (p < 0,001). Medtem ko se je fazni kot pomembno povečal (p < 0,001), je moč prijema ostala relativno stabilna. V podskupini pacientov z oceno MUST = 0 (17 bolnikov), smo po šestih mesecih opazili porast povprečne količine zaužite energije (p < 0,001) in povprečno količino zaužitih beljakovin (p = 0,003).*

Zaključki: *Rezultati raziskave so dokazali, da lahko z individualno naravnavami prehranskimi ukrepi, ki jih izvaja klinični dietetik, pri prehransko ogroženih pacientih s kronično boleznijo pomembno izboljšamo prehransko in funkcionalno stanje ter zmanjšamo njihovo prehransko ogroženost.*

Ključne besede:
prehransko presejanje
prehranski pregled
kronične bolezni
prehranska obravnava
primarno zdravstvo
antropometrične meritve
klinični dietetiki

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1 INTRODUCTION

It is now widely recognized that patient malnutrition is one of the most serious problems at all levels of healthcare (1-4). Malnutrition results from inadequate nutrient intake or absorption, leading to unfavourable alterations in body composition, cell mass, decreased physical and mental function, and poor clinical outcomes due to disease (5). Despite the scientific evidence and guidelines, there is a lack of practical implementation of knowledge and as a result, malnutrition often goes unrecognized and untreated (6). Failure to treat malnutrition has negative consequences for patient health and quality of life, as well as negative financial implications for the healthcare system (7-12).

In 2019, Klemenc-Ketis et al. (13) provided the only data available in Slovenia on the prevalence of nutritional risk at the primary healthcare level. Their community-based cross-sectional observational study included a population of 1,641 individuals who did not regularly attend family practice. The study revealed that 13.2% of these patients were identified as being at risk of malnutrition, using the Malnutrition Universal Screening Toll (MUST).

Similar to most European countries, Slovenia lacks the integration of nutritional support for patients at risk of malnutrition and nutritional therapy for malnourished patients into the standard medical treatment of all patients at the primary healthcare level. While professional standards for standardized nutritional care processes do exist, their implementation in clinical practice is still pending (14). The Slovenian Association for Clinical Nutrition, in partnership with the Slovenian National Institute of Public Health and Ministry of Health, has developed a comprehensive clinical pathway for integrated nutritional care across all levels of the healthcare system in Slovenia. However, the pathway is yet to be officially published and adopted nationwide.

Clinical dietitians play a crucial role in providing nutritional support in the primary healthcare setting for patients with chronic diseases who are at risk of malnutrition (15). As part of patients' care, clinical dietitians identify and assess their specific nutritional needs, develop an individualized nutritional plan and provide nutritional counselling. They conduct a comprehensive nutritional assessment of patients' dietary habits, nutrient intake, medical conditions and individual needs. Based on the assessment, they develop a personalized nutrition plan, considering patients' nutrient requirements, food preferences and special dietary restrictions. Dietitians may recommend dietary modifications, such as increasing energy and protein intake, to address patients' nutritional needs and support their optimal health (15, 16).

Strong scientific evidence for the health-related and financial benefits of nutritional therapy exists (17-20). The implementation of nutritional strategies, such as optimising protein and energy intake in individuals prone to disease-related malnutrition, has the potential to enhance both the nutritional intake and overall nutritional well-being of patients. This can in turn mitigate adverse outcomes for patients and society. However, there is a lack of studies that have examined the effect of nutritional interventions delivered by clinical dietitians at the primary healthcare level in patients with chronic diseases who are at risk of malnutrition or have malnutrition (17).

The objective of this study was to assess the effectiveness of personalized nutritional interventions, administered by a clinical dietitian, in managing nutritional risks among patients with chronic diseases. These interventions were implemented within the framework of the proposed clinical nutritional pathway in two primary health centres in Slovenia. Additionally, the study underscores the importance of regulating nutritional care for such patient groups at the primary healthcare level in Slovenia.

2 METHODS AND MATERIALS

2.1 Study design and settings

This was a longitudinal evaluation study, utilising a single group pre- and post-test design. We monitored a cohort of patients at nutritional risk of malnutrition at two distinct points: prior to the nutritional intervention and six months after.

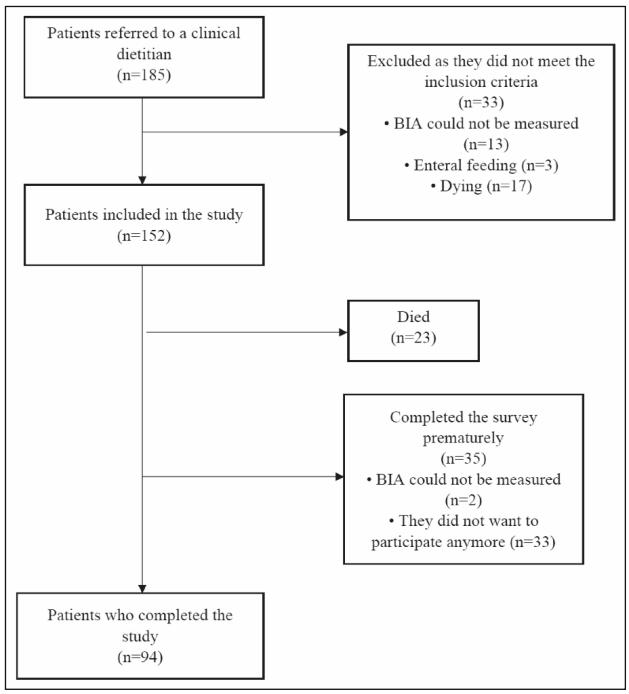
The research was conducted across two primary health centres in Slovenia: a sizable centre in Žalec and medium-sized centre in Celje. The study spanned from May 2020 to November 2022 and was approved by the Commission for Medical Ethics of the Slovenian Ministry of Health (number 0120-472/2020/8).

2.2 Participants

Participants were included in the sample using non-probability (convenience) sampling. The sample consisted of individuals who, throughout the observed period, were identified as being at nutritional risk and received treatment either from a general practitioner (GP) in a primary care physician's office or from a community nurse providing care at the patients' homes. Nutritional risk screening was performed by the GP or a community nurse. Adult patients (>18 years) of both sexes at nutritional risk who agreed to participate in the study and met all inclusion criteria were included in the sample.

The study did not include patients whose body mass and muscle strength could not be measured, dying patients, patients with a proven eating disorder, tube-fed patients and patients with a pacemaker. The number of patients included in the nutritional screening was 185. The number

of patients at nutritional risk who met all inclusion criteria was 152, and a total of 94 participants completed the 6-month examination. The reasons for dropout are described in Figure 1.

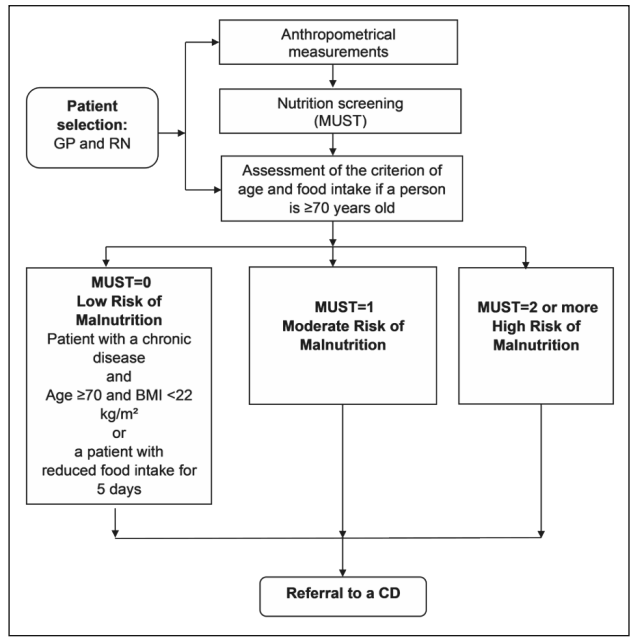


Legend: BIA=bioelectrical impedance analysis

Figure 1. Participants in the nutrition intervention and the reasons for exclusion or dropout from the study.

2.3 Study instruments

The nutrition care process considered all the steps defined in the proposed clinical nutrition pathway (Figure 2). Nutritional risk screening was performed using the established and validated screening tool MUST, which includes three criteria to wdetermine the overall risk of malnutrition: BMI, unintentional weight loss and impact of acute illness. The score obtained for each measure is used to assess the patient's overall level of nutritional risk. A MUST score of 0 indicates a low risk of malnutrition, a MUST score of 1 indicates a moderate risk, and a MUST score of 2 or more indicates a high risk of malnutrition (21-24). Due to limitations of the MUST tool, we included additional criteria in nutritional screening when the MUST score was assessed as 0. These were age ≥70 years and BMI <22 kg/m^2 with the presence of at least one chronic disease, or the patient had at least one chronic disease and a lower food intake in the last five days (25).



Legend: GP=general practitioner; RN=registered nurse; CD=clinical dietitian; MUST=Malnutrition Universal Screening Tool

Figure 2. Proposed clinical nutrition pathway.

2.4 Study intervention

All patients at nutritional risk were referred to a trained clinical dietitian for individualized nutrition support and counselling. The patients' nutritional support consisted of four sessions – the first visit and three follow-up visits. The first follow-up visit was carried out one month after the first visit, the second three months after and the third one six months after the first visit. Information on the patient's health status was obtained from the patient's medical records and provided to the dietitian by the GP who treated the patient. The clinical dietitian conducted comprehensive assessments, including nutritional intake, anthropometric measurements, body composition analysis and functional evaluations during each visit. In the final session, the clinical dietitian reassessed the nutritional risk with the MUST screening tool. Nutritional counselling, aligned with the principles of the Nutrition Care Process Model (NCPM) (26-28), focused on educating the patients on modifying their dietary intake to meet their energy, macronutrient and micronutrient needs. Following each visit, the clinical dietitian prepared a personalized nutritional plan, providing specific guidance for patients regarding suitable food types and amounts, along with suggestions for fortifying food and meals (e.g. incorporating protein powders and snacks). The plan also outlined the advised frequency of daily meals and specified the required daily energy and protein intake. Oral nutritional supplements (ONS) were offered when a patient's nutritional needs could not be met by a regular diet alone. The plan considered patient preferences,

potential limitations and existing chronic diseases. The main objective of the nutritional intervention in patients with a moderate or high risk of malnutrition (MUST≥1) was to improve their nutritional and functional status. In low-risk patients (MUST=0), the primary aim was to improve their nutritional intake and prevent the increase of their nutritional risk. The overall effect of the nutritional intervention was evaluated six months following the patient's initial visit with a clinical dietitian.

2.5 Nutritional assessment

Clinically relevant patient characteristics, which were measured as baseline data at the first visit and after six months, included nutritional risk score assessed with the MUST tool, a patient's nutritional status determined with anthropometric measures of BW, Body Mass Index (BMI) and body composition measures of Fat-Free Mass (FFM) and Fat-Free Mass Index (FFMI). Body composition was assessed with bioelectrical impedance analysis (BIA) using Bodystat Quadscan 4000. Muscle function was evaluated with phase angle (PA), measured with BIA, and hand grip strength, measured with a Baseline hydraulic hand dynamometer following the Southampton protocol (29). Nutritional intake was assessed with the patient's daily energy intake (kcal/d) and daily energy intake per kilogram of total body mass (kcal/kg TM). Protein intake was assessed with the patient's daily protein intake per kilogram of total mass (P/kg TM). Nutritional intake was assessed using a 24-hour retrospective recall method and a checklist of specific foods and beverages to verify food intake reported by patients and evaluated using the Prodi® 6 Expert programme (https://www.nutri-science.de/software/prodi.php).

Patients' nutritional intakes were estimated according to the most recent ESPEN guidelines for patients with various chronic diseases (30-35). A daily energy requirement of 30-35 kcal/kg TM and a daily protein intake of 1.2-1.5 g/kg TM was recommended for all patients, except for lower protein intake for patients with chronic renal insufficiency of 0.8 g/kg TM (36).

2.6 Statistical analysis

Data collection, visualization and statistical analyses were performed using R 4.2.1 version. Descriptive statistics were calculated, and all continuous data were expressed as a mean, median and standard deviation of the mean, minimum and maximum values. The categorical data were expressed as frequencies and percentages. The Kolmogorov-Smirnov test was carried out to test the normality of the continuous variables. Differences in measurements of nutritional status, nutritional intake and functional status before and after intervention were tested using the exact Wilcoxon signed-rank test (EWSRT). The significance level was set to 0.05.

3 RESULTS

3.1 Study participants

The baseline social demographic and clinical characteristics are described in Table 1.

Table 1. Baseline characteristics of the sample.

Characteristics	Values (n=94)
Basic variables	
Female	59 (63%)
Male	35 (37%)
Age, y	68 [15] (20- 92)
Living conditions	
Alone	21 (22%)
Community (family)	31 (33%)
With partner	42 (45%)
Comorbidities	
Cardiovascular diseases (including CAF)	37 (39%)
Pulmonary diseases	4 (4%)
Diabetes and other endocrine diseases	12 (13%)
Kidney diseases	4 (4%)
Gastrointestinal diseases	26 (28%)
Diseases of the liver and pancreas	3 (3%)
Oncological diagnoses	29 (31%)
Wounds	2 (2%)
Neurological diseases	6 (6%)
Rheumatological diseases	2 (2%)
COVID-19	2 (2%)
Other	13 (14%)

Note: Values are mean [SD] (minimum-maximum) for normally distributed continuous data and n (%) for categorical data
Legend: y=years, CAF=Chronical Atrial Fibrillation, COVID-19=Coronavirus Disease 2019

Among 94 patients participating in the study, 55 (59%) had one chronic disease, 33 (35%) had two, and 6 (6%) had three or more diseases. The comorbidity distribution based on the MUST risk groups are described in Table 2.

Table 2. Comorbidity distribution based on the risk groups (MUST).

Characteristics	MUST=0		MUST≥1	
One comorbidity	9	53%	46	60%
Two comorbidities	7	41%	26	34%
Three or more comorbidities	1	6%	5	6%
Total	17	100%	77	100%

Legend: MUST=Malnutrition Universal Screening Tool; MUST=0 indicates patients at low risk of malnutrition, MUST≥1 indicates patients with moderate or high risk of malnutrition

3.2 Nutritional risk after six months

An overview of how individuals' risk group categorization changed after 6 months using the MUST tool is presented in Table 3. It indicates the percentage of individuals who remained in the same risk category, improved their nutritional status or shifted to a higher risk category.

Table 3. Contingency table showing frequencies and proportions of patients based on the risk groups (MUST) at the beginning and after six months.

MUST score at the beginning	MUST score after 6 months			
	0	1	≥2	SUM
0	16 94%	0 0%	1 6%	17 100%
1	25 83%	4 13%	1 3%	30 100%
≥2	27 57%	12 26%	8 17%	47 100%

Legend: MUS=Malnutrition Screening Tool

3.3 Nutritional status, functional status and nutritional intake

Patients with MUST≥1 (77 patients) were included in the analysis of all changes in their nutritional status, nutritional intake, and functional status. The results are presented in Table 4.

In patients with MUST score of 0, we observed a statistically significant change after six months, as their median daily energy intake increased from 1303 kcal/d to 1990 kcal/d ($p<0.001$), median energy intake per kilogram of total mass increased from 18.5 kcal/kg TM to 28.0 kcal/kg TM ($p<0.001$), and protein intake also significantly increased from 0.8 g P/kg TM to 1.2 g P/kg TM ($p=0.003$).

Table 4. Comparison of changes in nutritional status, nutritional intake and functional status in a subgroup of patients with MUST≥1 (n=77).

Nutritional status values	1st assessment	2nd assessment	3rd assessment	4th assessment	Improvement (p value*)
BM (kg)	60.9 (56.50) [14.9] (39.1, 100.0)	60.9 (56.50) [14.9] (39.1, 100.0)	63.3 (59.0) [15.4] (39.5, 102.3)	64.0 (60.0) [15.3] (40.0, 103.7)	<0.001
BMI (kg/m^2)	22.0 (20.7) [4.9] (14.5, 41.1)	22.0 (20.7) [4.9] (14.5, 41.1)	22.8 (21.3) [4.8] (14.1, 39.0)	23.1 (21.9) [4.7] (14.3, 39.0)	<0.001
FFM (kg)	41.5 (38.6) [11.4] (19.8, 73.0)	41.5 (38.6) [11.4] (19.8, 73.0)	42.7 (39.7) [11.8] (20.2, 77.2)	42.8 (39.2) [11.7] (20.4, 76.1)	<0.001
FFMI (kg/m^2)	14.8 (14.5) [3.0] (9.2, 22.5)	14.8 (14.5) [3.0] (9.2, 22.5)	15.3 (14.8) [3.0] (7.9, 23.8)	15.3 (14.8) [3.0] (8.1, 23.5)	<0.001
Nutritional intake					
Energy (kcal/kg TM)	20.7 (20.3) [7.6] (5.6, 41.0)	20.7 (20.3) [7.6] (5.6, 41.0)	28.1 (28.7) [7.7] (3.1, 46.7)	30.3 (30.0) [7.1] (13.3, 53.3)	<0.001
Energy (kcal/d)	1217 (1121) [415] (369, 2339)	1217 (1121) [415] (369, 2339)	1722 (1744) [438] (155, 3176)	1876 (1945) [377] (850, 2749)	<0.001
Protein (g/kg TM)	0.9 (0.9) [0.4] (0.1, 2.3)	0.9 (0.9) [0.4] (0.1, 2.3)	1.3 (1.3) [0.4] (0.3, 2.6)	1.4 (1.4) [0.4] (0.5, 2.5)	<0.001
Functional status					
PA (°)	4.7 (4.7) [1.0] (2.4, 7.6)	4.7 (4.7) [1.0] (2.4, 7.6)	5.0 (4.9) [1.0] (2.5, 8.8)	5.0 (4.9) [0.9] (2.8, 7.5)	<0.001
Grip strength (kg)	24 (23) [11] (1, 62)	24 (23) [11] (1, 62)	26 (24) [12] (1, 64)	26 (24) [12] (1, 64)	0.080

Note: Values are mean (median) [SD] (minimum-maximum). *Wilcoxon signed rank test.
Legend: BM=Body Mass, BMI=Body Mass Index, FFM=Fat-Free Mass, FFMI=Fat-Free Mass Index, TM=Total Body Mass, kcal/kg TM=energy intake per kilogram of total body mass, kcal/d=daily energy intake, g/kg TM=daily protein intake per kilogram of total mass, PA=Phase Angle

4 DISCUSSION

In this six-month intervention study, we demonstrated the positive outcomes resulting from the nutritional interventions delivered by a clinical dietitian to patients with chronic diseases at risk of malnutrition. These interventions followed the principles of NCPM (26, 27) and were integrated into the proposed nutrition pathway (Figure 1).

In a subgroup of patients with a MUST≥1 (77 patients), the data show significant improvements in patients' nutritional intake and nutritional status. Additionally, despite the results of grip strength measurements remaining relatively constant after six months, we found that their functional status, measured with the PA, improved significantly (Table 4). The reduction in nutritional risk was statistically significant for patients initially assessed as having moderate or high risk of malnutrition, whereas low-risk patients exhibited consistent results after the six-month period (Table 3). These findings underscore the critical role of clinical nutritional measures in improving patients' nutritional and functional status and preventing potential deterioration. To our knowledge, this is the first study that confirmed the benefit of dietetic counselling within a primary healthcare system according to systematic clinical nutritional evaluation through a model of the clinical nutritional pathway.

Our findings are also in line with the results of several studies in different clinical settings investigating the impact of nutritional interventions performed by clinical dietitians across various populations of patients with chronic diseases. Notably, the research on individual dietary counselling for cancer patients undergoing oncological treatment revealed a significant reduction in weight loss by the end of the treatment period due to the nutritional intervention (37, 38). The study further demonstrated improved fulfilment of estimated energy and protein requirements during treatment (37), and individuals in the intervention group exhibited a notably enhanced state of nutrition or anabolic status (38).

Incorporating dietitians into the team for continuous care of geriatric patients following hospital discharge has improved patients' body mass (39, 40), energy and protein intake (39). However, as with our results, there was not always a statistical improvement in patients' grip strength (39, 40). Munk et al. (41) evaluated the effects of long-term, individualized nutritional interventions in elderly patients with several chronic diseases at hospital discharge. This intervention focused on optimizing protein intake, with a highlighted emphasis on the importance of strength training. Consistent with prior research (37-40), the patients in their intervention group lost significantly less body mass and experienced a significant increase in energy and protein intake. In addition, an improvement in physical function, as measured by the chair stand, was observed in the intervention group (41).

Our findings demonstrate that personalized nutritional intervention performed by a clinical dietitian contributes positively to enhancing patients' nutritional intake, nutritional status and phase angle. Importantly, the lack of improvement in hand grip strength highlights the importance of incorporating a strength training programme for this patient cohort.

The recent systematic literature review of 94 separate studies by Baldwin et al. (42) mainly found low-certainty evidence to suggest that dietary advice given with or without ONS may improve nutritional status in adults with disease-related malnutrition or at nutritional risk. While not revealing distinct patterns regarding the optimal timing for nutritional intervention to be effective across the trajectory of patients' diseases, the review indicates the feasibility of achieving increased energy intake and weight gain through dietary advice, with or without oral nutritional supplements (ONS) (42).

The favourable outcomes of our study indicate that the selected clinical approach, within the proposed nutritional pathway, integrated essential aspects of patient nutritional care (14). This proved effective even in an environment where knowledge and awareness regarding malnutrition-related issues are lacking. The nutritional pathway enabled the implementation of clinical guidelines in clinical practice, better planning, a patient-centred approach and implementation of effective nutritional intervention for each patient included in the study.

The study results also indicate that periodical individual nutritional counselling over six months enabled the patients to have frequent enough contact with the clinical dietitian, thus maintaining their motivation and enabling them to accept responsibility for following the set nutritional goals. It can also be inferred that periodic verification of anthropometric measurements and dietary intake was an opportunity for patients to monitor the progress of their nutritional status. Thus, there was greater engagement with the proposed nutritional therapy.

5 LIMITATIONS

The sampling type was convenience, the study was not randomized, and the study included only patients at nutrition risk in two health centres in Slovenia during a specific period, so we should not generalize the results. The primary strength of the study is the high compliance with the nutritional intervention in patients who completed the study, and the major weakness is the high dropout rate of the participants during the study (n=35) and patients who died during the study (n=23) (Figure 1). We presume that the most likely reason is that this study

was conducted during the sudden onset and widespread of the COVID-19 pandemic's mandated social distancing and quarantines.

6 CONCLUSIONS

Individually oriented nutrition dietary counselling and evaluation performed by a clinical dietitian had a beneficial effect on the patient's nutritional and functional status. The improvement of nutritional status protects patient health and enables better treatment of acute and chronic diseases. Our study confirms that clinical nutrition measures are recommended to be integrated into patients' treatment as a part of precision medicine. Clinical dietitians in primary healthcare settings play a crucial role in the nutritional care of patients with chronic diseases who are at risk of malnutrition. However, clinical dietitians in Slovenia are sparsely available in primary healthcare and are mainly part of health promotion centres that focus on preventive nutrition care for children and adults. Therefore, the results of this research may significantly contribute to understanding the important role of a clinical dietitian in primary care in Slovenia. It also highlights the need for immediate systemic activities: education of clinical dietitians based on international standards, national regulation of their professional profile and their systematization as health workers.

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CONFLICTS OF INTEREST

The authors declare that no conflicts of interest exist.

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ETHICAL APPROVAL

The study was approved by the Commission for Medical Ethics of the Slovenian Ministry of Health (number 0120-472/2020/8).

AVAILABILITY OF DATA AND MATERIALS

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

LLM STATEMENT

During the preparation of this article the author(s) used the GPT-3.5 language model to:

- review and amend grammatical and spelling mistakes,
- ensure linguistic consistency and coherence,
- test and fine-tune the article's wording,

After using this model, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

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KNOWLEDGE OF HEALTHCARE WORKERS REGARDING ROAD TRAFFIC CHILD SAFETY IN SOUTH BAČKA DISTRICT, SERBIA

ZNANJE ZDRAVSTVENIH DELAVCEV O VARNOSTI OTROK V CESTNEM PROMETU V JUŽNOBAČKEM OKRAJU, SRBIJA

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ABSTRACT

Introduction: Healthcare workers (HCW) can have an important role in educating parents about child road safety, but research on the topic shows that they usually do not have adequate knowledge. Thus, the aim of our study was to analyze their knowledge in the field of child road safety.

Methods: The cross-sectional study was conducted among HCW from South Bačka district, Serbia, using a specially created questionnaire for assessing knowledge on road traffic injuries in children.

Results: The research involved the participation of 317 healthcare workers (86 physicians and 231 nurses). Healthcare workers from primary healthcare made up almost 70% of all respondents, followed by those from tertiary (21.8%) and secondary (11.3%) level institutions. The average percentage of correct answers on the knowledge test was 74.3% (mean=22.3, SD=4.0). Out of all respondents, HCWs employed in the paediatrics department had a significantly higher percentage of correct answers at 77.7% (mean=23.3, SD=3.4) compared to other health workers at 73% (mean=21.9, SD=4.1) (p=0.002). Association analysis demonstrated that HCW employed at paediatric departments on average scored 1.37 (95% CI: 0.40-2.33, p=0.006) points higher in comparison with other HCW.

Conclusion: This research demonstrated an unsatisfactory level of knowledge on child road safety by HCW, and the variability across different question domains, which underlines the need for continuous educations in order to improve their knowledge. Our results may serve in planning additional public health measures and can provide a reference for future studies.

Keywords:
Road traffic injuries
Children
Knowledge
Healthcare workers
Prevention

IZVLEČEK

Uvod: *Zdravstveni delavci imajo lahko pomembno vlogo pri izobraževanju staršev o varnosti otrok v cestnem prometu, vendar raziskave na to temo kažejo, da običajno nimajo ustreznega znanja. Tako je bil cilj naše raziskave analizirati njihovo znanje s področja varnosti otrok v cestnem prometu.*

Metode: *Presečna študija je bila izvedena med zdravstvenimi delavci iz južnobačkega okraja, Srbija, z uporabo posebej izdelanega vprašalnika za ocenjevanje znanja o prometnih poškodbah pri otrocih.*

Rezultati: *V raziskavi je sodelovalo 317 zdravstvenih delavcev (86 zdravnikov in 231 medicinskih sester). Med vsemi anketiranimi je bilo skoraj 70 % zdravstvenih delavcev na primarni ravni, sledijo pa jim zaposleni na terciarni (21,8 %) in sekundarni (11,3 %) ravni. Povprečni odstotek pravilnih odgovorov na preizkusu znanja je bil 74,3 % (povprečje = 22,3, SD = 4,0). Med vsemi anketiranci so imeli zdravstveni delavci, zaposleni na pediatričnem oddelku, značilno večji odstotek pravilnih odgovorov (77,7 %) (povprečje = 23,3, SD = 3,4) v primerjavi z drugimi zdravstvenimi delavci (73 %) (povprečje = 21,9, SD = 4,1) (p = 0,002). Asociacijska analiza je pokazala, da so zdravstveni delavci, zaposleni na pediatričnih oddelkih, v povprečju dosegli 1,37 (95 % IZ: 0,40-2,33, p = 0,006) točke višje rezultate v primerjavi z drugimi zdravstvenimi delavci.*

Zaključek: *Ta raziskava je pokazala nezadovoljivo raven znanja zdravstvenih delavcev o varnosti otrok v cestnem prometu in variabilnost med različnimi domenami vprašanj, kar poudarja potrebo po nenehnem izobraževanju za izboljšanje njihovega znanja. Naši rezultati lahko služijo pri načrtovanju dodatnih javnozdravstvenih ukrepov in so lahko referenca za prihodnje študije.*

Ključne besede:
poškodbe v cestnem prometu
otroci
znanje
zdravstveni delavci
preprečevanje

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1 INTRODUCTION

Road traffic accidents (RTA) still represent an extremely significant public health problem at the global level despite the numerous successful measures and activities implemented during the Decade of Action for Road Safety 2011-2020 (1). Progress, achieved primarily in the creation and implementation of legislation, improvement of vehicle standards and better access and care after an accident, has not succeeded in compensating for the growth of the population and the number of motor vehicles (1). If a comparison is made with the data from the previous WHO report, it can be seen that deaths as a result of traffic accidents increased from 1.25 million in 2013 to 1.36 million annually in 2018 (2, 3) that is, around 3,700 people die on the world's roads every day. It is estimated that, without appropriate actions aimed at improving traffic safety, the situation will worsen, that by 2030 traffic injuries will be the fifth leading cause of death, it is currently eight leading causes of death for (4). Proclaiming the Second Decade of Action for Road Safety 2021-2030 involves a new target to reduce road deaths and injuries by 50% by year 2030 (5).

Children represent one of the most vulnerable categories of road users, first of all because they do not have developed psychophysical abilities like adults, and they do not have enough experience or knowledge about safe participation in traffic. On the other hand, young road users do not have enough experience in driving a vehicle, and also the degree of emotional maturity, as well as the lifestyle of young people, increases the risk of traffic accidents and the severity of the consequences of traffic accidents (4, 6). It is documented that injuries in traffic accidents are the leading cause of death among young people between the ages of 5 and 29 years old, and are one of the three leading causes of death for people aged 15 to 44 years. Analysis of the age-specific mortality rates from injuries according to external causes, in both sexes, showed that in total, children (0-19 years) die mostly due to traffic accidents (4).

Road traffic injuries (RTI) in children are also an important public health issue in Serbia. When analyzing the number of children that died in road traffic accidents during the period 1997-2021 in the Republic of Serbia, a decreasing trend was reported, even though the number varied from year to year. In the last ten years, 34 children aged 0-14 years died in traffic accidents, while 16,147 children were injured. In 2021, 101 young people aged 15-30 years died in Serbia, which is 19% of the total number of people that died in traffic accidents, that is, every fifth person. In the same year, 6,587 young road users were injured, which is 33% of the total number of people injured in road traffic accidents (7, 8).

Preventive programmes and a systematic approach to solving the problems of traffic accident victims require a multidisciplinary engagement of different professionals, in which the health sector is one of the leading partners. The most successful programmes globally are those that have integrated legislative, regulatory and enforcement systems, combined with data collection and management systems, economic evaluation systems to inform investment decisions, significant technical and executive capacity, and a substantial knowledge base of social, medical and behavioural implications of road safety interventions (4, 9). The health sector is responsible for the implementation of measures of traffic safety education and training in order to acquire adequate knowledge, skills and habits necessary for safe participation in traffic through education of citizens on the health aspects of safe behaviour in traffic.

Healthcare workers (HCW) can have an important role in raising awareness and educating parents about child safety in traffic (10). A prerequisite for this is adequate knowledge of HCW themselves about traffic safety. However, research on the topic shows that health workers lack education in this area and that they usually do not have adequate knowledge of, nor do they regularly disseminate, this information (11). Healthcare professionals cite as the most common obstacles the lack of time and knowledge to advise their patients in the area of child safety in traffic (11, 12). According to data from the literature, the level of knowledge of HCW on this topic ranges from 4% (13) to around 53% (12).

Taking into account the authority that HCW have among the parents of the paediatric population for whom they provide healthcare, HCW and associates play a significant role in educating and forming the opinions of their patients and their families when it comes to various health aspects, including traffic injury prevention (14–17).
Therefore, the aim of this paper was to analyze the knowledge of HCW in the field of child safety in traffic.

2 METHODS

2.1 Study design

The research was carried out as a cross-sectional study. In the period from February to November 2022, HCW from four healthcare institutions in South Bačka district (the Primary Healthcare Centre (PHC) in Novi Sad, the Institute for Health Protection of Children and Youth of Vojvodina, Vrbas General Hospital, the Gynaecology and Obstetrics Clinic at the Clinical Centre of Vojvodina) were invited to participate in the survey. The opinion poll encompassed 317 HCW. There were 90 (28.4%) participants (doctors and nurses) from paediatric departments, and 227 (71.6%) from other departments, predominantly general medicine and surgery. In the paediatric departments,

a higher percent of nurses participated in this research (85.5%) compared to other medical departments (67.9%) ($p<0.001$). Participation in the study was voluntary and anonymous. Each HCW was informed about the purpose of the study and signed an informed consent form. The questionnaire was distributed to the HCW by a researcher, and during their regular working time the HCW completed the questionnaire on a paper form. The total number of questionnaires distributed to healthcare workers was around 1,225 in total, and after a few solicits the response rate was 25.9. The research instrument was a structured questionnaire for assessing knowledge on road traffic safety and injuries in children. The structured questionnaire was developed by the researcher based on the aim of the study and based on questions used in similar studies about RTI in children. The questionnaires contained 30 multiple choice questions. The questionnaire consisted of two parts, first covered the sociodemographic characteristics of the respondents (age, gender, level of education, years of clinical work, having underage children) and the second part comprised questions to determine level of knowledge, risk perception, preventive measures towards road traffic safety and injuries in children. Questions were coded during the analysis as one and zero based on whether the response was correct or incorrect respectively. The coded data were entered in a specially created database.

2.2 Statistical analyses

We used descriptive statistics and presented categorical variables as absolute frequencies with percentages (%) while continuous and discrete data were presented as mean with standard deviation (SD). We used a Chi-squared test (or Fisher's exact test, where appropriate) for categorical variables and Wilcoxon rank-sum or ANOVA test for discrete variables. We used univariate and multivariate linear regression analyses to identify independently associated factors with the score on the knowledge test. All statistical analyses were performed using statistical software package Stata v.16 (College Station, TX: Stata Corp LLC. 2019), and $p<0.05$ was set as the level of statistical significance.

3 RESULTS

The research involved the participation of 317 healthcare workers (86 physicians and 231 nurses) across four healthcare institutions in the South Bačka district. There were more women in the research (n=275, 86.7%) than male respondents (n=42, 13.3%), and the average age of participants was 40.2 (SD±11.7) years. The average number of years of clinical experience was 15.9 years (SD±11.6). The average years of work experience was 14.5 for doctors and 16.3 for nurses. HCW from primary healthcare made up almost 70% of all respondents, followed by those from tertiary (21.8%) and secondary (11.3%) level institutions. The majority of the participants (59.6%) did not have underage children at the time of the research. Around 87% of participants did not participate in any educational activities (courses, continuing medical education, etc.) related to traffic trauma prevention in the last three years. Also, a higher percentage of HCW from paediatric departments (20%) participated in previous educational activities related to traffic trauma prevention compared to other departments (10.1%) ($p=0.018$).

All sociodemographic and professional characteristics of the respondents are shown in Table 1.

Table 1. General characteristics of the participants based on the department's activity.

	Total (n=317)	Paediatric activity (n=90)	Total (n=317)	p-value[1]
Sex				
male	42 (13.3)	7 (7.8)	35 (15.4)	0.07
female	275 (86.7)	83 (92.2)	192 (84.6)	
Age, mean (SD)	40.2 (11.7)	40.7 (11.7)	40.1 (11.7)	0.622
Age category				
19-29 years	67 (21.1)	18 (20)	49 (21.6)	0.83
30-39 years	85 (26.8)	22 (24.5)	63 (27.8)	
40-49 years	91 (28.7)	29 (32.2)	62 (27.3)	
50-65 years	74 (23.4)	21 (23.3)	53 (23.3)	
Number of underage children				
none	189 (59.6)	52 (57.8)	137 (60.3)	0.905
one	56 (17.7)	17 (18.9)	39 (17.2)	
two or more	72 (22.7)	21 (23.3)	51 (22.5)	
Level of healthcare institution				
primary	212 (66.9)	38 (42.2)	174 (76.7)	**<0.001**
secondary	36 (11.3)	3 (3.3)	33 (14.5)	
tertiary	69 (21.8)	49 (54.5)	20 (8.8)	
Profession				
doctor	86 (27.1)	13 (14.5)	73 (32.2)	**<0.001**
nurse	188 (59.3)	56 (62.2)	132 (58.2)	
high/higher nurse	43 (13.6)	21 (23.3)	22 (9.7)	
Years of work, mean (SD)	15.9 (11.6)	17.4 (11.8)	15.2 (11.5)	0.088
Years of work category				
<1 year	17 (5.4)	3 (3.3)	14 (6.2)	0.133
1-5 years	71 (22.4)	22 (24.5)	49 (21.6)	
6-20 years	124 (39.1)	28 (31.1)	96 (42.3)	
>20 years	105 (33.1)	37 (41.1)	68 (29.9)	
Counselling about RTI prevention during work time				
yes	29 (9.2)	10 (11.1)	19 (8.4)	0.445
no	288 (90.8)	80 (88.9)	208 (91.6)	
Participation in road safety education in the past 3 years				
yes	41 (12.9)	18 (20.0)	23 (10.1)	**0.018**
no	276 (87.1)	72 (80.0)	204 (89.9)	

Legend: [1]Chi squared (Fisher's exact test) or Wilcoxon rank-sum test, where appropriate. Figures in bold are results at the significance level p<0.05. *Other medical activity includes wards: general practice, emergency medicine, gynaecology, orthopaedics, radiology, laboratory, dentistry.

In Table 2, we presented the comparison of the total score on the knowledge test between HCW employed in the paediatrics department and other HCW, based on their general characteristics. We found a significantly higher number of correct answers in HCW from paediatrics departments in comparison to other HCW for females (p<0.001), those in the age category 30-39 years old (p=0.023), as well as HCW without underage children (p=0.002), from primary healthcare institutions (p=0.042) and for nurses (p=0.007). Also, a significantly higher number of correct answers was reported in HCW from paediatrics departments with ≥6 years of work (6-20 years, p=0.024; >20 years, p=0.006) as well as from those that do not provide counseling about RTI prevention during work time (p=0.008) relative to HCW from other departments.

The average percentage of correct answers on the knowledge test was 74.3% (mean=22.3, SD=4.0). Out of all respondents, HCWs employed in the paediatrics department had a significantly higher percentage of correct answers 77.7% (mean=23.3, SD=3.4) compared to other health workers 73% (mean=21.9, SD=4.1) (p=0.002). More than 85% of HCW correctly identified road traffic injuries as a leading cause of death of children after the first year of life, with a higher percent of correct answers in those from paediatric departments (91.1%) compared to others (82.8%) (p=0.061). On the other hand, there was a statistically significant difference in the percent of correct answers in the domain child car seats are installed safely if they are in accordance with the manufacturer's instructions, between HCW from paediatric (92.2%)

Table 2. Number of correct answers based on general characteristics of the study participants.

	Total, mean (SD)	Paediatric activity, mean (SD)	Other medical activity, mean (SD)	p-value[1]
Sex				
male	21.6 (4.9)	20.9 (5.9)	21.8 (4.7)	0.72
female	22.4 (3.8)	23.5 (3.1)	22.0 (4.0)	<0.001
Age category				
19-29 years	21.5 (4.1)	21.3 (4.3)	21.6 (4.1)	0.992
30-39 years	22.7 (4.0)	24.5 (2.8)	22.1 (4.2)	0.023
40-49 years	22.6 (3.9)	23.8 (2.1)	22.1 (4.4)	0.054
50-65 years	22.2 (3.9)	23.1 (4.1)	21.8 (3.8)	0.092
Number of underage children				
none	21.7 (4.2)	22.8 (3.8)	21.3 (4.2)	0.002
one	23.6 (3.3)	24.1 (2.4)	23.5 (3.6)	0.863
two or more	22.9 (3.7)	23.9 (3.0)	22.6 (3.9)	0.167
Level of healthcare institution				
primary	21.6 (4.2)	22.6 (3.6)	21.3 (4.3)	0.042
secondary	23.4 (2.4)	24.0 (1.0)	23.4 (2.5)	0.641
tertiary	24.1 (3.1)	23.8 (3.3)	24.8 (2.6)	0.343
Profession				
doctor	22.8 (3.6)	23.9 (2.5)	22.6 (3.8)	0.288
nurse	21.9 (4.2)	23.1 (3.7)	21.5 (4.4)	0.007
high/higher nurse	23.0 (3.2)	23.5 (3.2)	22.5 (3.3)	0.135
Years of work category				
<1 year	22.3 (4.5)	22.7 (0.6)	22.2 (4.9)	0.941
1-5 years	21.7 (4.3)	22.1 (4.5)	21.6 (4.2)	0.545
6-20 years	22.9 (3.7)	24.3 (2.2)	22.5 (4.0)	0.024
>20 years	22.1 (3.9)	23.3 (3.4)	21.4 (4.0)	0.006
Counselling about RTI prevention during work time				
yes	22.4 (4.7)	24.3 (3.8)	21.4 (4.9)	0.07
no	22.3 (3.9)	23.2 (3.4)	22.0 (4.0)	0.008
Participation in road safety education in the past 3 years				
yes	22.2 (4.9)	24.6 (2.3)	20.3 (5.6)	0.013
no	22.3 (3.8)	23.0 (3.6)	22.1 (3.9)	0.035

Legend: [1]t-test or Wilcoxon rank-sum test (Fisher's exact test), where appropriate

and other departments (76.2%) (p=0.001), as well as in the domain of the correct handling of the child car seat between HCW from paediatric and other departments, 93.3% versus 84.6% (p=0.036) respectively.

Also, more than 90 percent of respondents knew that pregnant women must wear a seat belt, and that a child is safest in a rear-facing car seat. In contrast, a lack of knowledge was observed when answering the question about the age of a child up to which they must be transported in a rear-facing car seat; about a third of respondents correctly answered this question, where those employed in paediatrics scored higher relative to those from other departments (35.6% vs. 29.1, p=0.260). When it comes to using a child car seat, only 48.3% of the participants knew that in Serbia, the law stipulates that a child in a vehicle must be transported in a child car seat. However, a little more than a third of HCW (37.5%, n=119) were able to correctly answer the question when a child is big enough to wear a seat belt independently without using child car seats (being 150 cm tall and weighing 36 kg). The attitudes of HCW towards injury prevention and participation in these activities showed that 92.1% of the respondents recognize the injury of children in traffic as a public health problem, while only 27.8% consider it a part of their professional duties because they are the authority for parents. A detailed specification of correct answers on all other question domains and across participants' departments is presented in Table 3.

Table 3. Number of correct answers by study participants and across the department's main medical activity.

	Total, n (%)	Paediatric activity (n=90)	Other medical activity (n=227)	p-value[1]
Total correct answers on test, mean (SD)	22.3 (4.0)	23.3 (3.4)	21.9 (4.1)	**0.002**
How many people die every year as a result of traffic accidents in the world?	151 (47.6)	53 (58.9)	98 (43.2)	**0.012**
Leading cause of death for children and young adults aged 5-29 years in the world?	267 (84.2)	73 (81.1)	194 (85.5)	0.338
What is primary prevention of RTI?	245 (77.3)	76 (84.4)	169 (74.5)	0.055
Child seats and boosters reduce the risk of injury and death in a crash by what percentage?	234 (73.8)	67 (74.4)	167 (73.6)	0.873
Leading cause of death among children aged 1-14 years in Serbia	270 (85.2)	82 (91.1)	188 (82.8)	0.061
Minimum height for transition from booster seat belt to seat belt only	213 (67.2)	56 (62.2)	157 (69.2)	0.235
According to Serbian law, a child of what age can sit in the front seat	129 (40.7)	42 (46.7)	87 (38.3)	0.173
Whether the use of seat belts in both the front and back seats is mandatory by law	253 (79.8)	76 (84.4)	177 (78.0)	0.196
Is it prescribed by law in Serbia that in public transport we have to use a child car seat	153 (48.3)	46 (51.1)	107 (47.1)	0.523
For pregnant women it is prescribed by law that they must use a seat belt	286 (90.2)	85 (94.4)	201 (88.6)	0.111
The best possible protection for babies while riding in the car	286 (90.2)	84 (93.3)	202 (89.0)	0.24
Minimum age an infant can be forward-facing	98 (30.9)	32 (35.6)	66 (29.1)	0.26
A sign that you've outgrown the rear-facing car seat is	269 (84.9)	77 (85.6)	192 (84.6)	0.827
A properly restrained child in a car seat means	270 (85.2)	78 (86.7)	192 (84.6)	0.638
How many fingers can fit between the child's chest and harness if they are properly tight	264 (83.3)	79 (87.8)	185 (81.5)	0.177
Child car seats are installed safely if they are in accordance with the manufacturer's instructions	256 (80.8)	83 (92.2)	173 (76.2)	**0.001**
A newborn's first ride should be in a rear-facing car seat	273 (86.1)	82 (91.1)	191 (84.1)	0.106
Minimum height, weight and age to transition from car seat to booster seat	197 (62.2)	63 (70.0)	134 (59.0)	0.069
Minimum height and weight to graduate from booster seat with seat belt to seat belt only	119 (37.5)	33 (36.7)	86 (37.9)	0.84
Should we tighten the child in a car seat in a winter jacket?	248 (78.2)	67 (74.4)	181 (79.7)	0.303
Whether between the child and the car seat we can put something that is not an original part of the car seat (towel, blanket)	272 (85.8)	78 (86.7)	194 (85.5)	0.782
Each seat has a guarantee period for safe use specified by the manufacturer	229 (72.2)	71 (78.9)	158 (69.6)	0.096
Knowledge of the correct handling of the child car seat	276 (87.1)	84 (93.3)	192 (84.6)	**0.036**
Knowledge of the need to deactivate the airbag	303 (95.6)	89 (98.9	214 (94.3)	0.125
Regular use of seatbelts	269 (84.9)	79 (87.8)	190 (83.70)	0.361
Regular use of head restraints in the car	294 (92.7)	87 (96.7)	207 (91.2)	0.099
Responsibility for child RTI	292 (92.1)	84 (93.3)	208 (91.6)	0.612
Health providers are important partners in promoting the importance and proper use of child car seats	88 (27.8)	19 (21.1)	69 (30.4)	0.096
Advising parents on the importance of car seats	286 (90.2)	86 (95.6)	200 (88.1)	0.057
Source of information on proper use of car seats	286 (90.2)	86 (95.6)	200 (88.1)	0.057

Legend: [1]Chi squared (Fisher's exact test) or Wilcoxon rank-sum test, where appropriate. Figures in bold are the results at the significance level $p<0.05$.

We additionally explored the effect of years of professional activity on the level of knowledge of RTI in children. We classified participants in three categories, those with ≤5 years of active service (n=88, 27.8%), 6-20 years (n=124, 39.1%), and those with >20 years (n=105, 33.1%), and noticed that the highest mean value of the correct answers (22.9, SD±3.7) had respondents with 6-20 years of work experience. Additionally, HCW from category >20 years of professional activity scored the lowest (69.5% of correct answers) in the domain of fastening the child in a car seat in a winter jacket, compared to other categories (p=0.030). On the other hand, those from the youngest working category, with ≤5 years of active service, scored the lowest in the domain responsibility for child RTI (p=0.038).

Table 4. Univariate and multivariate analyses of association between personal characteristics of HCW and performance in the knowledge test.

				Model 1			Model 2		
	Coef.	95% CI	p-value	Coef.	95% CI	p-value	Coef.	95% CI	p-value
Sex									
male	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
female	0.81	-0.49-2.11	0.219	0.63	-0.66-1.92	0.336	0.8	-0.43-2.04	0.203
Age, mean (SD)	0.01	-0.03-0.05	0.581	0.01	-0.03-0.05	0.628	0.04	0.01-0.08	0.02
Age category									
19-29 years	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
30-39 years	1.21	-0.06-2.49	0.063	1.22	-0.04-2.49	0.057	1.19	-0.15-2.53	0.081
40-49 years	1.14	-0.12-2.40	0.075	1.07	-0.17-2.32	0.091	1.49	0.15-2.83	0.03
50-65 years	0.7	-0.62-2.01	0.3	0.67	-0.63-1.98	0.309	1.63	0.33-2.93	0.014
Number of underage children									
none	ref.	ref.	ref.	ref.	ref.	ref.	-	-	-
one	1.95	0.78-3.12	0.001	1.91	0.75-3.07	0.001	-	-	-
two or more	1.25	0.19-2.32	0.021	1.23	0.18-2.28	0.022	-	-	-
Level of healthcare institution									
primary	ref.	ref.	ref.	ref.	ref.	ref.	-	-	-
secondary	1.88	0.52-3.24	0.007	1.94	0.57-3.30	0.005	-	-	-
tertiary	2.51	1.47-3.56	<0.001	2.21	1.01-3.40	<0.001	-	-	-
Profession									
doctor	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
nurse	-0.82	-1.84-0.19	0.112	-1.03	-2.05-(-0.02)	0.046	-1.54	-2.53-(-0.55)	0.002
high/higher nurse	0.22	-1.24-1.68	0.766	-0.27	-1.74-1.21	0.723	-0.17	-1.55-1.21	0.813
Department's main activity									
Paediatric activity	1.37	0.40-2.33	0.006	-	-	-	0.4	-0.64-1.43	0.449
Other medical activity	ref.	ref.	ref.	-	-	-	ref.	ref.	ref.
Years of work	-0.01	-0.04-0.03	0.771	-0.01	-0.05-0.03	0.592	0.02	-0.02-0.06	0.331
Years of work category									
<1 year	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
1-5 years	-0.55	-2.66-1.56	0.61	-0.75	-2.83-1.34	0.481	-0.32	-2.34-1.71	0.757
6-20 years	0.59	-1.43-2.61	0.564	0.52	-1.47-2.51	0.609	1.08	-0.10-3.16	0.308
>20 years	-0.25	-2.29-1.79	0.812	-0.51	-2.53-1.51	0.619	0.65	-1.35-2.66	0.521
Counselling about RTI prevention during work time									
yes	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
no	-0.1	-1.63-1.43	0.896	-0.01	-1.52-1.50	0.99	-0.02	-1.49-1.44	0.976
Participation in road safety education in the past 3 years									
yes	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
no	0.17	-1.14-1.48	0.795	0.42	-0.88-1.73	0.524	0.52	-0.74-1.78	0.418

Legend: Model 1 - adjusted for the department's main activity. Model 2 - adjusted for level of healthcare institution and the number of underage children

When analyzing the association between personal characteristics of HCW and performance in the knowledge test we noticed that the score on the knowledge test was, on average, 1.95 (95% CI: 0.78-3.12, p=0.001) and 1.25 (95% CI: 0.19-2.32, p=0.021) points higher for those HCW with one and with two or more underage children, respectively, in comparison with those without underage children. Similarly, HCW from secondary and tertiary healthcare institutions scored 1.88 (95% CI: 0.52-3.24, p=0.007) and 2.51 (95% CI: 1.47-3.56, p<0.001) points higher compared to HCW from primary level institutions. On the other hand, HCW employed at the paediatric departments on average scored 1.37 (95% CI: 0.40-2.33, p=0.006) points higher in comparison with other HCW.

After adjustment for the department's main activity the results remained substantially the same, while when adjusting for the level of healthcare institution and the number of underage children, age was a significant predictor of the score on the knowledge test, where those of older age scored better (40-40 years old, coef: 1.49, 95% CI: 0.15-2.83, p=0.03; and 50-65 years old, coef: 1.63, 95% CI: 0.33-2.93, p=0.014) relative to their youngest colleagues (age 19-29 years old). Also, nurses on average scored 1.54 (95% CI: -2.53-(-0.55), p=0.002) points lower relative to physicians.

4 DISCUSSION

The fact is that the level of education of road users is very important for the prevention of traffic accidents, and it has also been confirmed that HCW can help reduce RTIs through the important role of communication/information in both their professional and private environments (18). The results of our research indicate insufficient knowledge, especially in several important domains among HCW regarding road traffic safety, given that the average percentage of correct answers in the test was 74.3%. Given that the results of the research indicate a lack of knowledge about the proper use of child car seats by health workers, it is necessary to prioritize the education of health workers as an important partner in health education work with parents as a priority in public health policies (19). HCWs also need "train the trainer" education to advise and teach parents the requisite knowledge and skills for the importance and safe use of child car restraints. In our study, only 13% of respondents reported that they had received education about child car seat systems in the last three years, reflecting the need for greater HCW knowledge. In the study by Tan et al. only 4.4% of respondents had previously attended teaching on child car seat systems (20).

In our study, we found that paediatric health professionals were more knowledgeable about road traffic injuries in children compared to other healthcare providers. The results of the survey conducted among healthcare workers in Croatia are in line with our results, where paediatric health professionals also had the highest score of correct answers at 60.8 (mean overall % correct) (14). The results of a study conducted in the USA suggest that healthcare providers also show a lack of knowledge about child safety in traffic, which can contribute to the suboptimal use of car safety seats when it comes to children aged 4-14 years (13). Similarly, among our respondents, healthcare professionals demonstrated insufficient knowledge regarding the safety of children in cars. Lack of knowledge is related to the questions what is the minimum age at which children can graduate from a rear-facing child safety seat to a forward-facing child safety seat, when should the child transition to a booster seat, at about what height are children generally ready to graduate from a booster seat to wearing only a-lap shoulder belt, and until what age are children safest riding in the back. Additionally, HCW in Poland also had insufficient knowledge about child restraint systems (21).

In the study by Cohen and Runyan almost all (94%) knew that injury was the leading cause of death for children aged 1 to 4 years, showing similar results to our study in which 91.1% of paediatric health professionals and 82.8% of other providers gave the correct answer (22, 23). Also, Brčina et al. reached similar results in their research, where more than 80% of HCW gave the correct answer regarding injuries as the leading cause of death of children after the age of first year (24).

The recommendations of the WHO advocated for health professionals being involved in road safety by adopting a coordinated public health and multisectoral approach, which is currently missing in Serbia. One of the best examples of how the involvement of health providers in road safety has been beneficial is Sweden, which with a death rate due to traffic trauma of 2.8 per 100,000 inhabitants, is a leader in the field of traffic safety. The experience in Sweden, which in the period from 1990 to 2015 reduced the number of traffic fatalities by 66%, shows what results can be achieved by long-term multi-year planning of a systematic approach based on evidence, with strong institutional support that includes leadership, multi-sectoral cooperation, sustainable investments and a focus on achieving road safety (25, 26)

Healthcare professionals play an important role in educating and forming the opinions of their patients and their families when it comes to various health aspects, including injury prevention (27). The results of research around the world confirm the fact that HCW are a key factor in the prevention of all types of traumas, especially

in children, and the improvement of road traffic safety among children and young people (10, 28–30). The research we conducted shows that HCW are aware of the problem, but do not recognize themselves as authorities for parents in this regard, which is contrary to the general view that HCW are the authority of the population for whom they provide healthcare. Our study indicates a gap between the attitudes of healthcare workers and their daily practice. Only 5% of the respondents in our study answered that they knew how to use car seats correctly and recognized themselves in advising parents about the safe carriage of children in a car. This low percentage of providers and their attitude can arise from a failure to recognize the importance of RTI as a health problem and lack of knowledge. Also, HCW in primary healthcare made up almost 70% of all respondents. A study by the American Medical Association also showed the importance of the role of the family physician in the recognition of risk factors and counselling in the field of road traffic safety (31).

In our study, we reported that HCW with underage children had a higher score in the knowledge test in comparison with those without underage children. This result is probably due to the fact that HCW with underage children also learned from their own experience and likely searched for RT prevention information compared to those without kids or with older children, since in the past there were very few or no such clear recommendations and regulations for child traffic safety. A recent study from Saudi Arabia demonstrated that parents with two underage children and those with higher education had better knowledge of child car safety seat regulations (32). The same study assessed the independent predictors of good knowledge and found that only age and education were among the demographic factors significantly associated with better knowledge.

In our study, the HCW employed at the paediatric departments on average scored higher points on the knowledge test in comparison with other HCW. Also, HCW from secondary and tertiary healthcare institutions scored better compared to HCW from primary level institutions. Similarly, the study from Croatia found that paediatricians had more knowledge about general injuries in children compared with other HCW (14). This is expected because HCW from paediatric departments, and especially those HCW from the secondary and tertiary level, were more informed about RT safety in children probably due to more frequently being involved in the treatment of children with RT trauma, and usually deal with more severe cases relative to HCW from the primary level. In general, paediatricians are recognized by parents as a credible source of information for injury prevention in childhood, and as such, must have updated information on laws and regulations regarding RT safety in children in order to provide quality counselling (33, 34).

Our research has some strengths and some limitations. A major strength of our study is that, to the best of our knowledge, this is the first study of its kind in our country to investigate this important topic and to collect valuable information about HCWs' knowledge regarding road traffic safety in children. Even though our sample is relatively small, we collected a large number of variables for risk factors which allowed us to explore independently associated factors with the overall score on the knowledge test. Our results may serve in planning additional public health measures and education of HCW. And finally, our study can provide a reference for future studies, and especially for pre-post interventional studies to assess the effect of specific education on RT safety in this country and in the region. On the other hand, our sample was limited and, even though we included several healthcare institutions from the primary, secondary and tertiary level, this research was conducted in just one district, thus our results should not be generalized to the national level. Also, since participation was voluntary and anonymous, the possibility remains of a selection bias, i.e., among those that are particularly interested in this topic or have (more) prior knowledge, thus we might not have included those with a low(er) level of knowledge. Thirdly, the questionnaire used was not validated prior to implementation in this study, and we cannot exclude the possibility that some questions might not be fully understood by the participants, even though we used clear language and precise terms. Fourthly, the study design did not allow us to assess changes in knowledge over time since it was assessed in a single time-point, thus further longitudinal studies are warranted to additionally explore this issue.

5 CONCLUSION

This research demonstrated an unsatisfactory level of knowledge of RTI in children by healthcare professionals, and the variability across different question domains. These results additionally underline the need for continuous medical education and promotional activities about road traffic safety in order to improve the knowledge of HCW in Serbia, and to apply the acquired knowledge and skills in everyday work with patients, at all levels of healthcare and, above all, for those who come into direct contact with the parents of children (paediatricians, gynaecologists, nurses, etc.). Future research is warranted to evaluate the effect of this education on the level of acquired knowledge of the HCW.

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CONFLICTS OF INTEREST

The authors declare that no conflicts of interest exist.

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ETHICAL APPROVAL

Ethical approval to conduct the study was obtained from the Ethics Committee of the Institute of Public Health of Vojvodina under the number 01-368/1.

AVAILABILITY OF DATA AND MATERIALS

All data and materials used in this study are available upon reasonable request.

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Ratislavová K, Horová J, Marek P. Measuring women's satisfaction with childbirth: A literature review of measurement properties.
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MEASURING WOMEN'S SATISFACTION WITH CHILDBIRTH: A LITERATURE REVIEW OF MEASUREMENT PROPERTIES

MERJENJE ZADOVOLJSTVA ŽENSK S PORODOM: PREGLED LITERATURE O LASTNOSTIH MERJENJA

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Systematic review

ABSTRACT

Introduction: Patient satisfaction is an important indicator of the quality of care provided. Evaluating women's satisfaction with childbirth is essential to improving obstetric care and ensuring a positive experience for mothers and newborns. The tools used to measure women's satisfaction with childbirth are very heterogeneous and multidimensional. Assessment tools used in practice should be tested and meet characteristics that are consistently validated.

The aim is to identify currently available instruments measuring women's satisfaction with childbirth and to evaluate their structure, content and psychometric properties.

Methods: A systematic search for sources was carried out according to the criteria set. For the included studies, psychometric properties were assessed in accordance with the principles of the guideline for completing systematic reviews of patient-reported outcome measures, COSMIN.

Results: The review included 31 studies that reported the psychometric properties of six measurement instruments (questionnaires, scales). Content validity, structural validity, internal consistency, reliability and cross-cultural validity were assessed for the included studies. The Childbirth Experience Questionnaire (CEQ/CEQ2) and Birth Satisfaction Scale - Revised (BSS-R) were the most commonly used questionnaires in the studies.

Conclusions: Thorough testing of tools measuring women's satisfaction with childbirth, and adapting them to cultural and social contexts, is still essential. It is crucial that valid and reliable questionnaires are available for midwives in practice, for use in research, to inform clinical practice and for the results to help develop the services offered.

Keywords:
Women's satisfaction with birth
Psychometric properties of assessment tools
Systematic reviews

IZVLEČEK

Uvod: *Zadovoljstvo bolnikov je pomemben kazalnik kakovosti zagotovljene oskrbe. Ocenjevanje zadovoljstva žensk s porodom je bistveno za izboljšanje porodniške oskrbe in zagotavljanje pozitivne izkušnje za matere in novorojenčke. Orodja za merjenje zadovoljstva žensk s porodom so zelo heterogena in večdimenzionalna. Orodja za ocenjevanje, ki se uporabljajo v praksi, bi morala biti preizkušena in imeti lastnosti, ki se dosledno potrjujejo.*

Cilj je opredeliti trenutno razpoložljive instrumente za merjenje zadovoljstva žensk s porodom ter oceniti njihovo strukturo, vsebino in psihometrične lastnosti.

Metode: *Opravljeno je bilo sistematično iskanje virov skladno z določenimi merili. Za vključene študije so bile ocenjene psihometrične lastnosti skladno z načeli smernic za izvajanje sistematičnih pregledov merjenja rezultatov, ki jih sporočajo bolniki COSMIN.*

Rezultati: *Pregled je zajemal 31 študij, ki so poročale o psihometričnih lastnostih šestih merilnih instrumentov (vprašalniki, lestvice). Za vključene študije so bile ocenjene veljavnost vsebine, strukturna veljavnost, notranja usklajenost, zanesljivost in medkulturna veljavnost. Najpogosteje uporabljena vprašalnika v študijah sta o porodni izkušnji (Childbirth Experience Questionnaire - CEQ/CEQ2) in revidirana lestvica zadovoljstva s porodom (Birth Satisfaction Scale - Revised - BSS-R).*

Zaključki: *Temeljito preizkušanje orodij za merjenje zadovoljstva žensk s porodom in njihovo prilagajanje kulturnim in družbenim okoljem je še vedno izjemno pomembno. Ključno je, da so na voljo veljavni in zanesljivi vprašalniki, ki se lahko uporabljajo v babiški praksi, v raziskavah, za podporo klinični praksi in za doseganje rezultatov, ki bodo prispevali k razvoju ponujenih storitev.*

Ključne besede:
zadovoljstvo žensk s porodom
psihometrične lastnosti orodij za ocenjevanje
sistematični pregledi

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1 INTRODUCTION

Maternal and child health has been a priority public health issue for decades and is internationally considered one of the best measures for assessing the quality of healthcare. Currently, health systems are moving towards high-value care tailored to each individual patient. Patient satisfaction is generally an important indicator of the quality of care provided. Based on patient satisfaction results, measures can be taken to improve services. One way in which patient satisfaction can be assessed is through the development and application of satisfaction measurement tools (1).

As in other disciplines, perinatal care can benefit from systematic evaluation of patient-reported experience measures to improve the quality of care. Assessing women's satisfaction with childbirth is a complex task that is increasingly important for healthcare providers, administrators and policy makers. It is essential to take into account women's views and experiences in order to make improvements in midwifery care and ensure a positive experience for mothers and newborns. The most common way of assessing women's satisfaction with childbirth is through the use of questionnaires (2). Questionnaires provide an effective way of obtaining information about patient experience and allow for comparison.

As birth satisfaction is a multidimensional construct, the instruments used to measure it are also very heterogeneous. The inconsistent approach to assessing women's satisfaction with childbirth complicates the possibilities of comparison, both within a health system in one country and internationally. Authors of birth satisfaction questionnaires often focus only on some aspects of satisfaction, rather than on satisfaction as a whole. Moreover, it is evident that many questionnaires used to measure satisfaction with maternity care have not been thoroughly developed or tested (3, 4).

In 2017, two systematic reviews on instruments measuring women's satisfaction with childbirth were published by Nilvér et al. (5) and Blazquez et al. (2). The authors focused on assessing instruments used to measure women's satisfaction with care during childbirth related to the construction, reliability and validity of these instruments. The first review (5) analysed and evaluated thirty-six measurement tools and the second review (2) presented seventeen tools. The recommendations arising from these two studies are broadly similar. Both review studies (5, 2) emphasise the importance of identifying and assessing women's experiences and satisfaction with childbirth. Knowing and respecting the needs of patients (birth mothers) plays a very important role in the process of improving maternal and child care. They point out that despite the fact that there is a wide range of tools available to measure women's satisfaction with their birthing experience, there is great variation in their quality. Given the large number of instruments used in the literature and the lack of complete testing of many of them, the authors of the review studies recommend that researchers should not continue to develop new instruments but should seek to thoroughly test, adapt and improve those that already exist. When different instruments are used to measure the same construct of interest, it can be difficult to compare results in systematic reviews.

The aim of the literature review is:

a) to identify currently available instruments measuring women's satisfaction with childbirth;

b) to evaluate, compare and summarise their structure, content and psychometric properties.

2 METHODS

The design of the literature review was adopted. The conduct of this literature review followed the COnsensus-based Standards for the selection of health Measurement INstruments (COSMIN) guidance for completing systematic reviews of patient-reported outcome measures (6), adapted as necessary to suit this review.

2.1 Study inclusion criteria

Construct of interest

- Women's satisfaction with childbirth

Research participants

- This review includes all studies in which women participated after childbirth, regardless of weeks of pregnancy, mode of delivery or number of children.
- Studies in which participants were partners of women or health professionals were excluded.

Types of results

- This review includes full text articles in English.

Types of studies

- This review includes validation studies.
- Included are studies that reported psychometric properties related to the development, validity and reliability of instruments (questionnaires, scales) used to measure women's satisfaction with childbirth.
- Excluded studies were: case report or series, systematic review, meta-analysis, if an instrument was being used within a randomised trial or alternative study, or if the instrument was being used as part of the validation process of an alternative instrument.
- Studies reporting instruments measuring women's satisfaction with a specific birth situation (women's satisfaction in preterm birth, after caesarean section,

etc.) not related to the phenomenon of 'satisfaction' (instruments developed solely to measure specific concepts such as fear, anxiety, self-efficacy, etc.) were excluded. Studies using unidimensional instruments were also excluded.

2.2 Methods of study selection

A systematic search for studies was conducted to identify and locate relevant sources. All screening was completed by two reviewers independently (KR and JH; midwives with >15 years' experience and also researchers with >10 years' experience) and disagreements resolved through face to face discussion. Searches were conducted in Web of Science, Medline/PubMed, EBSCOhost, Science Direct, CINAHL, Wiley, Springer and ProQuest databases. Studies published in Czech or English in the period 2018–2022 were searched: "delivery" OR "lab*r" OR "birth" OR "childbirth" AND "validation" AND "questionnaire" OR "scale" OR "instrument" AND "women's satisfaction" OR "experience" OR "perception".

The identification and selection of research studies for this review are described in the PRISMA flow chart (Figure 1).

2.3 Data analysis

The psychometric properties of the measurement instruments were assessed according to the principles of the COSMIN methodology (6). Content validity, structural validity, internal consistency, reliability and cross-cultural validity were assessed. Three reviewers (KR, JH, PM – statistician and analyst) were involved in assessing the psychometric properties of the questionnaires. Results were evaluated once by each rater and inter-rater agreement was observed; any differences were resolved by discussion. Inter-rater reliability was ensured by strict adherence to the COSMIN manual for systematic reviews of PROMs (6, p. 28-32).

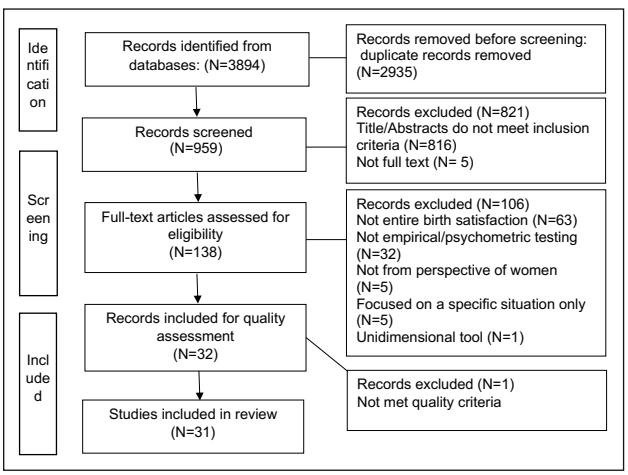

Figure 1. PRISMA flow diagram.

3 RESULTS

Thirty-one studies were included in the review (Table 1), reporting the psychometric properties of six measurement instruments (questionnaires, scales). Only one study (7) aimed to develop and validate a new measurement instrument of satisfaction with childbirth. Most researchers focused on existing instruments measuring women's satisfaction with childbirth, which is consistent with the recommendations of the authors of previous review studies (2, 5). The aim of the studies was to translate, adapt and validate the already existing instruments in a new cultural and social setting. Five original measurement tools were adapted and validated in 21 countries.

3.1 Characteristics of included instruments

All adaptations of measurement tools into a foreign language were done according to standards, most often by back-translation, expert review and pre-test (N=10–50). The structure and content of the questionnaires varied. They contain 3 to 10 different dimensions/factors and 10 to 52 items (Table 1). The items in the questionnaires were rated on a four to seven point Likert scale. The CEQ/CEQ2 questionnaire has some items rated on a visual analogue scale (12, 23).

The most frequently reported dimension was satisfaction with healthcare providers (perception of midwifery care and professional support, satisfaction with midwife, obstetrician, relationship with staff, quality of care provided). Other frequent dimensions reported were satisfaction focused on the woman herself (her emotions, perceptions of pain, feelings of safety, control, expectations, ability to participate in decision-making), support from loved ones (partner or other person present), the baby (contact, bonding) and the environment (Table 2).

Most studies have focused on women a few days to a few months postpartum, up to 5 years postpartum (37).

Table 1. Characteristics of included instruments.

Instrument/ abbreviation/origin	Authors	Country	Number of respondents	Number of domains/ items
Iranian women childbirth experience questionnaire IWCBEQ original	Hosseini Tabaghdehi et al., 2020 (7)	Iran	781	7 domains 52 items
Women's Views of Birth Labor Satisfaction Questionnaire Original **WOMBLSQ,** Smith, 2001 (8)	Pozo-Cano et al., 2020 (9)	Spain	385	9 domains 32 items
Questionnaire for Assessing Childbirth Experience Original **QACE,** Carquillat et al., 2017 (10)	Rodríguez Coll et al., 2021 (11)	Spain	268	4 domains 23 items
Childbirth Experience Questionnaire Original **CEQ,** Dencker, 2010 (12)	Abbaspoor et al., 2019 (13)	Iran	203	4 domains 21 items
	Mamuk et al., 2019 (14)	Turkey	250	4 domains 22 items
	Kazemi et al., 2020 (15)	Iran	250	4 domains 22 items
	Patabendige et al., 2020 (16)	Sri Lanka	309	4 domains 22 items
	da Silva Vieira et al., 2020 (17)	Brazil	308	4 domains 22 items
	Boie et al., 2020 (18)	Denmark	377	3 domains 22 items
	Parchaa et al., 2021 (19)	Mongolia	761	4 domains 20 items
	Kalok et al., 2022 (20)	Malaysia	246	4 domains 21 items
	Marques et al., 2022 (21)	Portugal	161	4 domains 20 items
	Zhu et al., 2019 (22)	China	1747	4 domains 19 items
Childbirth Experience Questionnaire 2 Original **CEQ2,** Dencker et al., 2020 (23)	Dencker et al., 2020 (23)	Sweden	682	4 domains 22 items
	Ghanbari-Homayi et al., 2019 (24)	Iran	500	4 domains 23 items
	Walker et al., 2019 (25)	United Kingdom	263	4 domains 22 items
Birth Satisfaction Scale-Revised Original **BSS-R,** Hollins Martin and Martin, 2014 (26)	Jefford et al., 2018 (27)	Australia	198	3 domains 10 items
	Škodová et al., 2019 (28)	Slovak Republic	506	3 domains 10 items
	Romero-Gonzalez et al., 2019 (29)	Spain	202	3 domains 10 items
	Skvirsky et al., 2020 (30)	Israel	288	3 domains 10 items
	Martin et al., 2020 (31)	Australia	445	3 domains 10 items
	Nasiri et al., 2021 (32)	Iran	212	3 domains 10 items
	Nespoli et al., 2021 (33)	Italy	297	3 domains 10 items

Instrument/ abbreviation/origin	Authors	Country	Number of respondents	Number of domains/ items
	Omani-Samani et al., 2021 (34)	Iran	396	2 domains 6 items
	Mortazavi et al., 2021 (35)	Iran	784	3 domains 10 items
	Zafar et al., 2021 (36)	Pakistan	200	3 domains 10 items
	Emmens et al., 2021 (37)	Netherlands	244	3 domains 10 items
	Radoš et al., 2022 (38)	Croatia	552	3 domains 10 items
	Anikwe et al., 2022 (39)	Nigeria	500	3 domains 9 items
	Özdemir Gökmen et al., 2022 (40)	Turkey	219	3 domains 10 items
	Ratislavová et al., 2022 (41)	Czech Republic	461	3 domains 10 items

Table 2. Dimensions of measurement instruments of women's satisfaction with childbirth.

Dimensions	BSS-R	CEQ	CEQ2	WOMBLSQ	QACE	IWCBEQ
Professional support and care	✓	✓	✓	✓	✓	✓
Partner support				✓		✓
Self-assessment		✓	✓		✓	
Personal attributes	✓					
Baby, bonding				✓		✓
Preparation,				✓		✓
expectations				✓		
Pain		✓	✓		✓	
Feeling safe	✓					✓
Fear, anxiety, distress						✓
Positive feelings, emotional well-being		✓	✓	✓	✓	✓
Sense of control, participation				✓		
Environment				✓		
Overall satisfaction with the childbirth						

3.2 Psychometric properties of measuring instruments

Content validity is the most important property of measurement tools. The content validity of measurement tools was assessed according to the COSMIN methodology (6). Clarity is one of the components of content validity. All the translated tools used in our review were pilot tested on the target population, which is a condition for inclusion of a study in the review (6). Face validity was performed for all studies. We report the assessment of the psychometric properties of each measurement tool according to the COSMIN manual for systematic reviews of PROMs (6, p. 28–29) in Table 3.

Table 3. Evaluation of psychometric properties of measuring instruments.

PROM	Study	Structural validity	Internal consistency		Cross-cultural validity	Reliability
			Total	Subscale		
IWCBEQ	(7)	?*	+	-	?	?
WOMBLSQ4	(9)	?	?	-	+	?
QACE	(11)	+	+	-	+	+
CEQ	(13)	?	+	-	+	+
	(14)	-	+	-	+	?
	(15)	+	+	-	+	+
	(16)	?*	+	-	+	+
	(17)	?	+	-	?	+
	(18)	?*	+	+	+	+
	(19)	-	+	-	+	?
	(20)	-	+	-	+	?
	(21)	?	+	-	+	-
CEQ 2	(22)	+	+	?	+	?
	(23)	+	+	+	+	?
	(24)	-	+	-	+	+
	(25)	?	?	-	+	-
BSS-R	(27)	-	+	-	+	?
	(28)	+	+	-	+	?
	(29)	-	+	-	+	?
	(30)	-	+	+	+	?
	(31)	+	+	+	+	?
	(32)	+	+	+	?	+
	(33)	+	-	-	+	?
	(34)	?*	-	-	+	?
	(35)	-	+	-	+	?
	(36)	-	-	-	+	?
	(37)	-	+	+	+	?
	(38)	+	+	+	+	?
	(39)	?*	+	?	?	?
	(40)	-	+	+	?	?
	(41)	+	+	+	+	?

Legend: "+" = sufficient, "-" = insufficient, "?" = indeterminate
?* only EFA (Exploratory Factor Analysis) is listed, not CFA (Confirmatory Factor Analysis)

4 DISCUSSION

The aim of this review was to identify, describe and evaluate instruments measuring women's satisfaction with childbirth. The World Health Organization (WHO) emphasized the importance of women's positive experience of childbirth in its recent document "Intrapartum care for a positive childbirth experience" (42). The importance of woman-centred care, whereby the quality of perinatal care is optimized through a holistic, human rights-based approach, is emphasised. Measuring women's satisfaction with childbirth requires valid, reliable and multidimensional tools (31).

The most commonly used questionnaires in research studies have been the Childbirth Experience Questionnaire (CEQ/ CEQ2) and the Birth Satisfaction Scale-Revised (BSS-R).

The CEQ2 shows excellent psychometric properties in the study by Walker et al. (25). It contains 22 items that are rated on a 4-point Likert Scale, and three items are rated on a visual analogue scale. The CEQ2 is easy to understand and easy to complete. Items in the questionnaire focus on, for example, the woman's feelings during labour, particularly her sense of security, the midwife's behaviour, memories of the birth and the opportunity for shared decision-making during labour. The results of the questionnaire differ significantly between groups of women with different birth experiences (e.g., lower satisfaction among women with operative delivery, delivery longer than 12 hours, delivery with oxytocin augmentation) (23).

The BSS-R is a valid, reliable instrument to measure women's satisfaction after childbirth, which can be easily and quickly completed by women, with only ten items rated on a 5-point Likert Scale. The content of the questionnaire focuses on, for example, feelings of anxiety and stress during childbirth, support from staff, co-decision making, sense of control, as well as the birth itself (length, injuries). In studies by Martin et al. (31), Nasiri et al. (32), Radoš et al. (38) and Ratislavová et al. (41), the scale has excellent psychometric results. Future studies need to focus on testing the stability and reliability of an instrument over time.

The BSS-R scale is currently recommended by the International Consortium for Health Outcomes Measurement (ICHOM) as the main tool for measuring women's experiences of childbirth (43). ICHOM recommends that all obstetric care providers worldwide begin to measure satisfaction with childbirth using the BSS-R to better understand how to improve the lives of their clients. The BSS-R has been used in 39 countries and 134 sites worldwide in 2020 (44). Hollins Martin and Martin founded the Birth Satisfaction Consortium, which brings together researchers and professionals who work in perinatal care research and delivery. The consortium aims to (45): Translate and validate the BSS-R for use in different populations and cultures and make these versions available for use; Collecting data from around the world on women's experiences and satisfaction with childbirth to improve the delivery of maternity care; Identifying risk (negative) and protective (positive) factors associated with the experience of childbirth in different cultural contexts; Opportunities to consult on preventive strategies to minimize the impact of psychological trauma during childbirth in different cultural contexts; Dissemination and sharing of research findings to maternity care professionals and the general public.

In terms of the limitations affecting this review, it should be noted that only studies published in English were assessed, relatively strict inclusion criteria were applied, and additional tools may have been validated during the time we were conducting the review. Therefore, some instruments may not have been identified. In the process of assessing the psychometric properties of the questionnaires, the selection of raters/reviewers should be mentioned. Evaluating the relevance, comprehensiveness and clarity of the included studies with respect to the construct of interest and the study population requires very good expertise. Assessing the validity of measurement instruments requires knowledge of statistical methods and procedures, as well as the subjective judgment of reviewers. The erudition of the reviewers is important and should always be mentioned when presenting results for individual studies (46). We assembled our review team with an awareness of the importance of the expert erudition of the reviewers.

5 CONCLUSIONS

Thorough testing of instruments measuring women's satisfaction with childbirth, and adapting them to cultural and social contexts, is essential. Our study highlights two important and high-quality instruments that have been adapted and translated into a number of languages. This allows us to assess the quality of care provided in different countries, but also to identify cultural differences and the impact of different healthcare delivery systems on women's satisfaction with childbirth. Research suggests that monitoring women's satisfaction with childbirth gives women the opportunity to engage in perinatal care, contributes to improving the quality of care provided, and may play a role in avoiding litigation and maintaining competitive advantages for healthcare facilities whose clients are satisfied (47). It is essential that valid and reliable questionnaires are available for midwives in practice, for use in research, to inform clinical sites, and that the results help to develop the services offered.

CONFLICTS OF INTEREST

The authors have no conflict of interest to declare.

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ETHICAL APPROVAL

Not applicable as the article is not based on any human data.

AVAILABILITY OF DATA AND MATERIALS

Data sharing is not applicable to this article as no datasets were generated or analysed during the current study.

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SLOVENIAN JOURNAL OF PUBLIC HEALTH
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October 2023

These instructions are in accordance with the ICMJE recommendations for the conduct, reporting, editing and publication of scholarly work in medical journals. Complete instructions can be found in the following PDF: http://www.icmje.org/icmje-recommendations.pdf.

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The Slovenian Journal of Public Health has been published since 1962 by the National Institute of Public Health in Slovenia. Since 2003, the journal has been a peer-reviewed scientific journal with English abstracts, and since 2014, an international scientific public health journal in English only. The journal's mission is to promote new achievements in the broad field of public health in Slovenia and Central and South-East Europe. The Slovenian Journal of Public Health publishes internationally oriented articles and encourages an interdisciplinary approach to public health. The journal is a source for exchanging new public health concepts and solutions among researchers. The journal mainly publishes original scientific articles, and on occasion also systematic reviews, methodological articles, and invited editorials. It is published four times a year, with up to 35 articles each year, and has an average annual rejection rate of around 80%. The journal is indexed in major international databases, such as PubMed, Web of Science, and Scopus, and has had an impact factor since 2011, ranging from 0.16 to 1.6. As an open-access journal it is available online on De Gruyter, Sciendo https://sciendo.com/journal/SJPH. The manuscripts are peer-reviewed by three international reviewers, and the process is double-blinded, fair and constructive.

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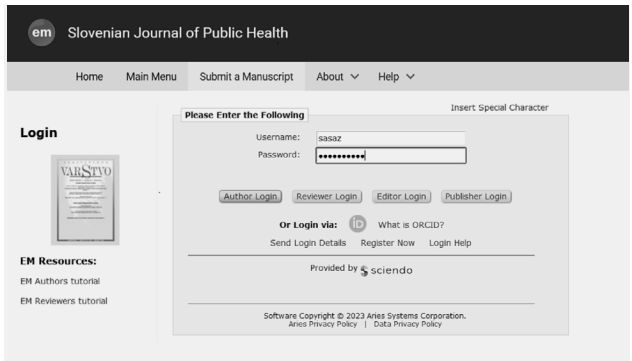

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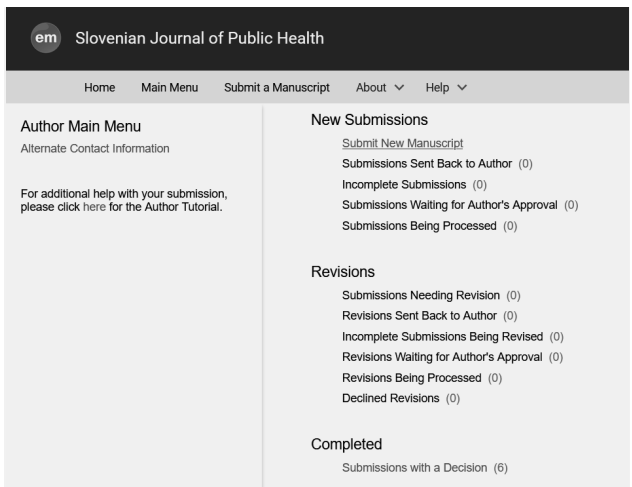

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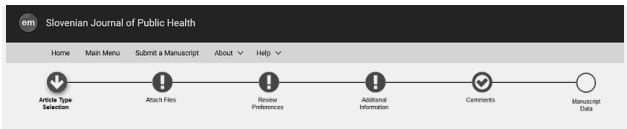

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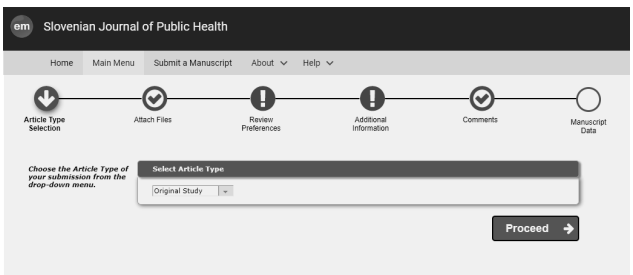

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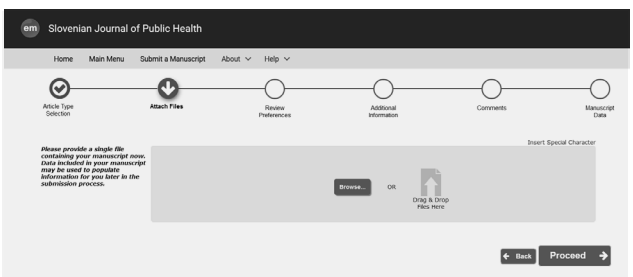

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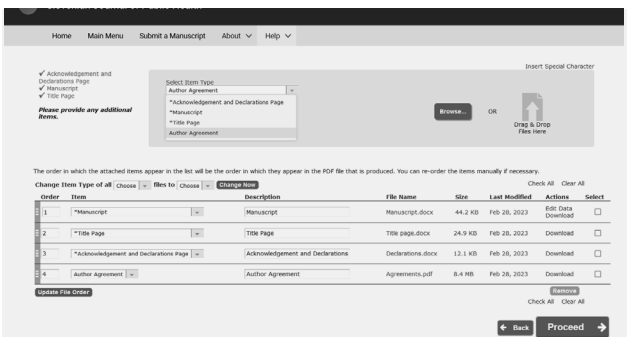

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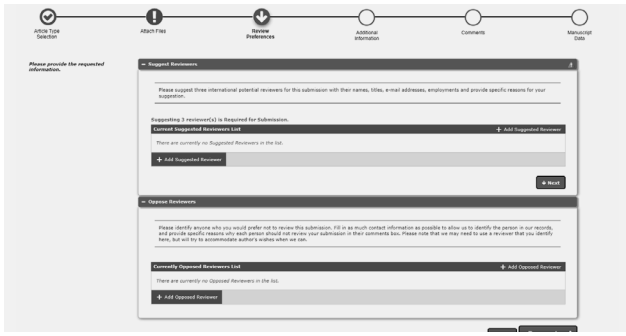

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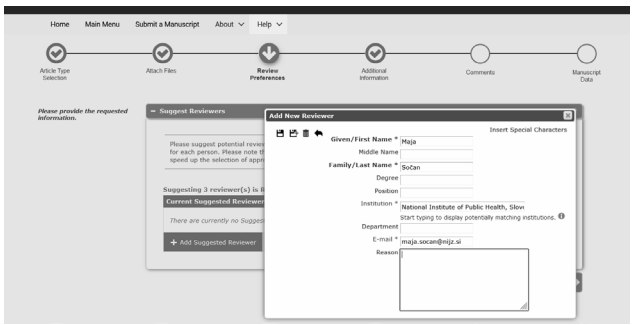

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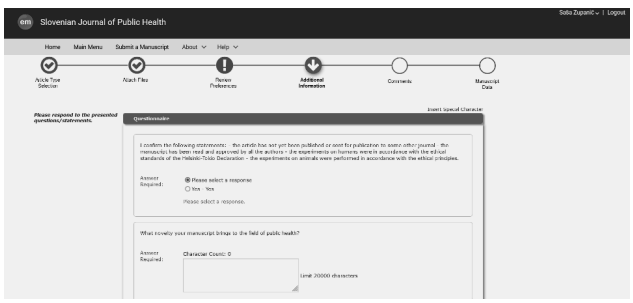

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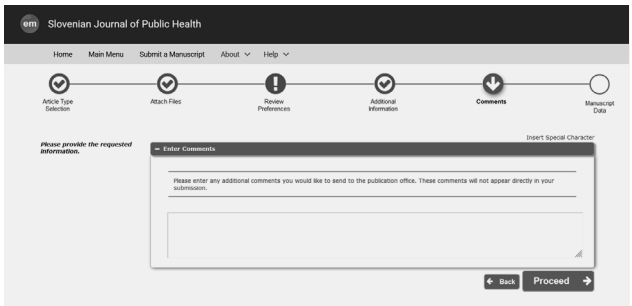

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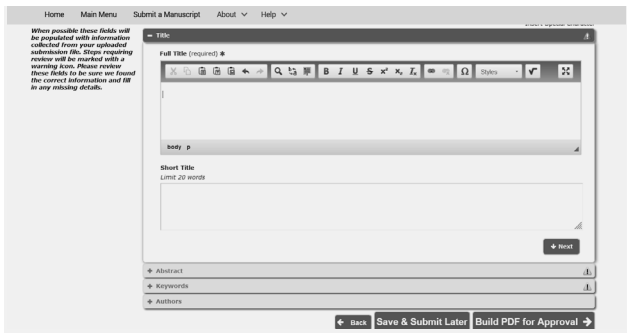

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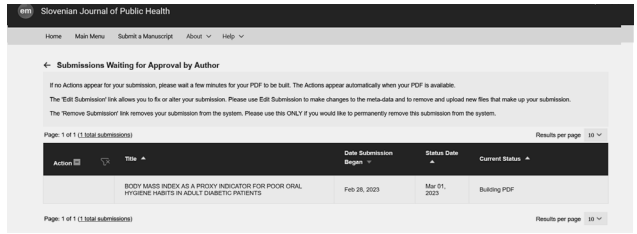

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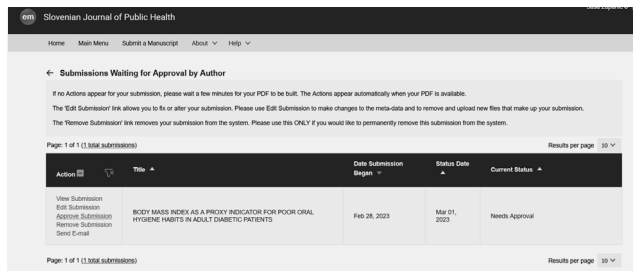

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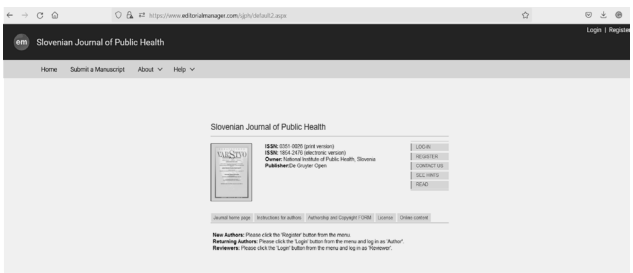

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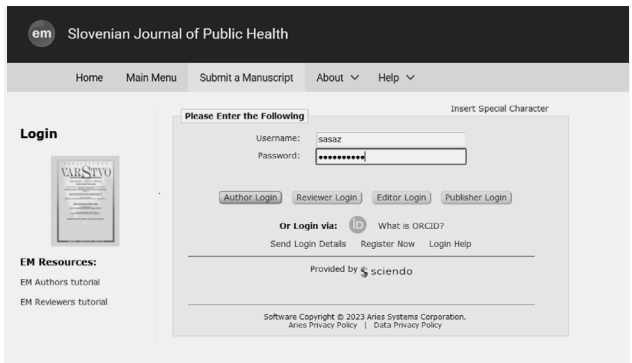
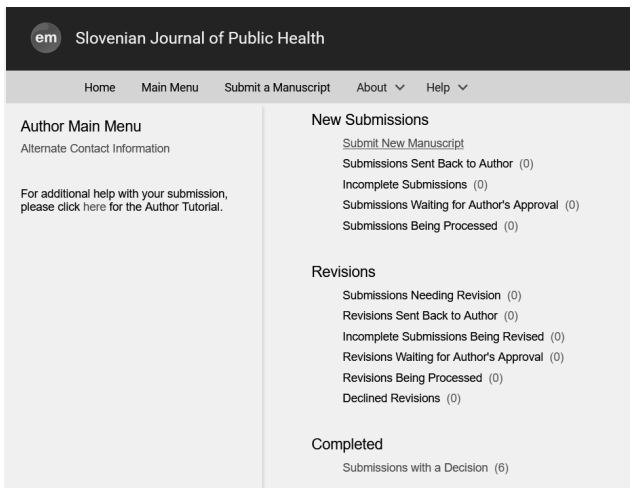


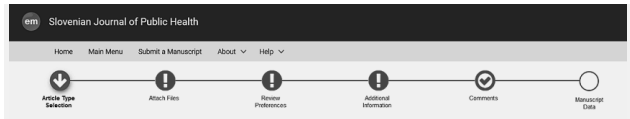
ODDAJA NOVEGA ROKOPISA

Po uspešni prijavi se pojavi ta meni. Za oddajo novega rokopisa kliknete na Submit New Manuscript.



VNOS PODATKOV

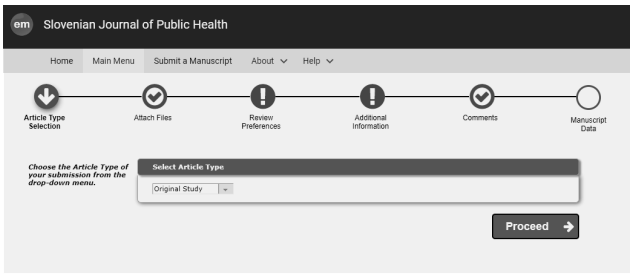
Oddaja rokopisa zahteva zaporeden vnos več podatkov, ki si jih bomo ogledali v nadaljevanju: Article Type Selection, Attach Files, Review Preferences, Additional Information, Comments in Manuscript Data.



KATEGORIJA ROKOPISA (Article Type Selection)

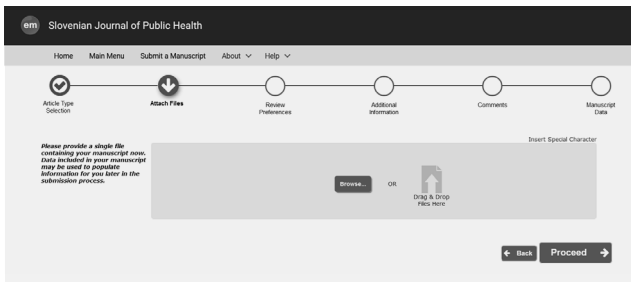
Kategorijo rokopisa določite z izborom vrste rokopisa.

Objavljamo izvirne znanstvene članke in metodološke članke (izberete Original Study), sistematične pregledne znanstvene članke (izberete Systematic Review) in vabljene uvodnike (izberete Invited Editorial). Po izboru kliknete na gumb Proceed.

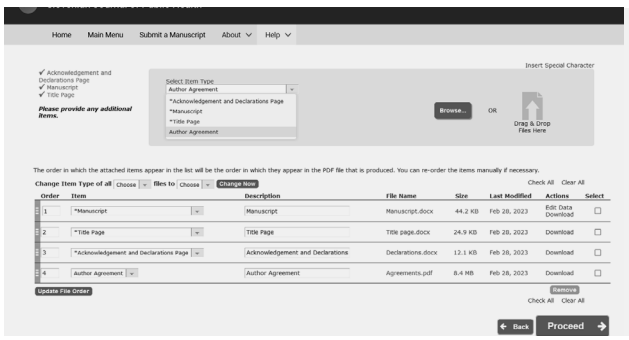


PRIPONKE (Attach Files)

Sledi vnos priponk: rokopisa, naslovne strani, izjav z morebitno zahvalo in avtorskih pogodb. Obvezno oddate tri Wordove priponke: Manuscript, Title Page, Acknowledgement and Declaration Page. Podpisane pogodbe Authorship and Copyright Transfer Agreements za vse soavtorje združite v en PDF dokument. Oddaja v tej fazi je zaželena, a ni obvezna. Podpisane pogodbe so pogoj za objavo članka. V uredništvo jih lahko oddate tudi naknadno po sprejemu članka v objavo po e-pošti zdrav.var@nijz.si.

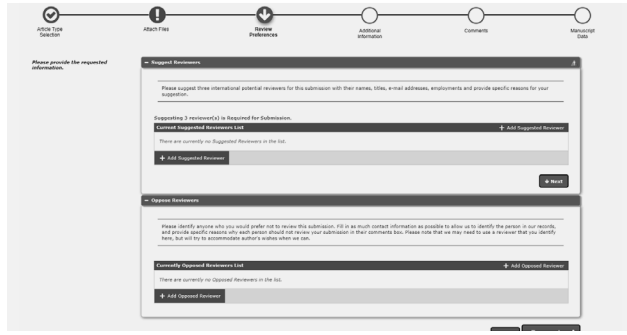


S klikom na gumb Browse vstopite v svoj računalnik in naložite rokopis. Enako naredite za naslovno stran, izjave z morebitno zahvalo in avtorske pogodbe. Nato kliknite na gumb Proceed.

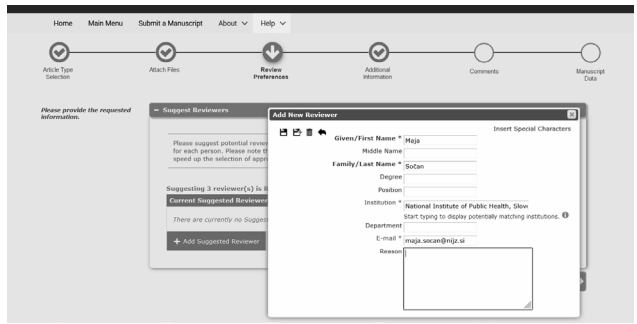


RECENZENTI (Review Preferences)

Vnesite prosim predlog treh mednarodno priznanih recenzentov. Pribeležite lahko tudi do dva neželena recenzenta.

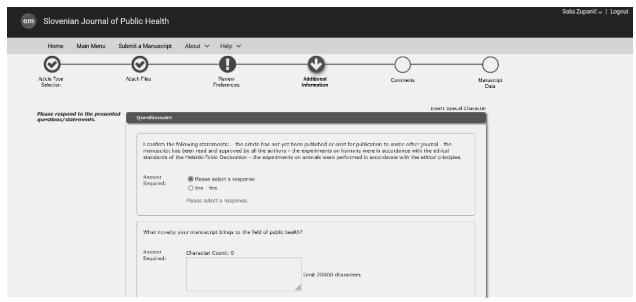


Nujni podatki so ime, priimek, zaposlitev in e-naslov. Razlog za izbor je zaželen podatek.



DODATNE INFORMACIJE (Additional Information)

Ta del je namenjen potrditvi dodatnih izjav avtorjev in opisu novosti vašega rokopisa.

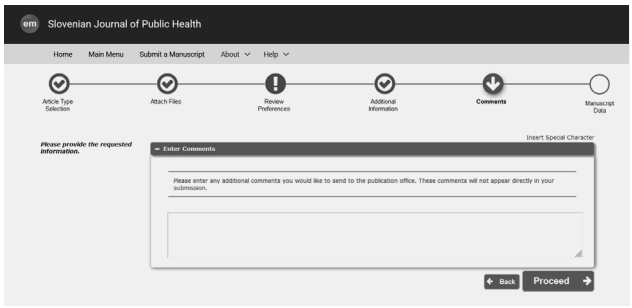


Potrdite izjavo, da vaš prispevek še ni bil objavljen ali poslan v objavo kakšni drugi reviji, da so prispevek prebrali in se z njim strinjajo vsi soavtorji, in da so raziskave na ljudeh oz. živalih opravljene v skladu z načeli Helsinško-Tokijske deklaracije oz. v skladu z etičnimi načeli.

V drugo okno zapišite novosti, ki jih vaš rokopis prinaša področju javnega zdravja.

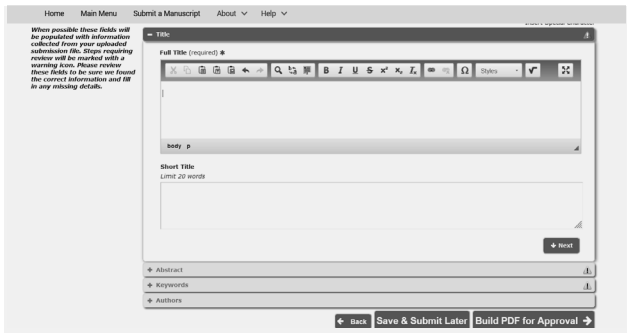
KOMENTARJI (Comments)

Polje Comments je namenjeno vnosu komentarjev, ki bi jih avtorji želeli dodatno posredovati uredništvu revije.



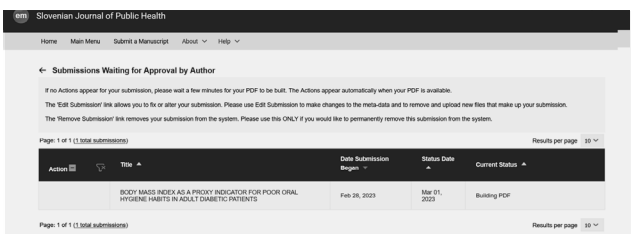
METAPODATKI (Manuscript Data)

Metapodatki so naslov, izvleček, ključne besede in avtorstvo. Naslov, izvleček in ključne besede se oddajajo dvojezično v angleščini in v slovenščini (ne velja za tuje avtorje) v strukturirana polja. Posebno polje za zapis v drugem jeziku obstaja le za izvleček, preostale podatke vnesite v obeh jezikih v ustrezno isto polje v drugo vrstico. Prvi izvleček je vselej v angleškem jeziku (do 250 besed - sistem vam besede sproti šteje), drugi pa v slovenskem jeziku (razširjen izvleček - do 400 besed). Zapišite še 4 do 6 ključnih besed v množini in v obeh jezikih; če se le da, naj bodo usklajene s tezavrom MeSH. Podatke o avtorju in soavtorjih vnesite kar se da natančno in popolno. Naveden naj bo korespondenčni avtor (s polnim naslovom, telefonsko številko in elektronskim naslovom), ki bo skrbel za komunikacijo z uredništvom in ostalimi avtorji.

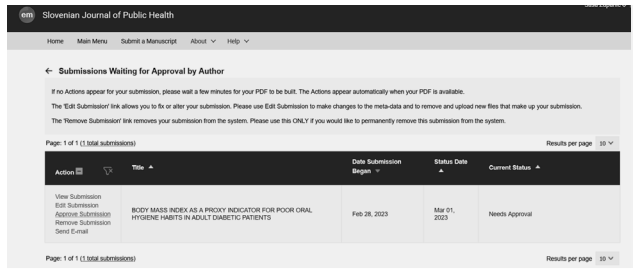


PDF ROKOPISA

Zadnji korak pri oddaji rokopisa je izgradnja PDF rokopisa.



Postopek malo traja, zato počakajte, da sistem PDF zgradi, PDF odprite, preglejte in potrdite s klikom na gumb Approve Submission.



Tako ste rokopis oddali v uredništvo, sledi uredniški postopek. Hvala, da ste za oddajo svojega rokopisa izbrali revijo Zdravstveno varstvo. V primeru težav se prosim obrnite na uredništvo.

NATANČEN OPIS ZAHTEV ZA VSE PRIPONKE

ROKOPIS

Jezik rokopisa je angleščina. Ime datoteke z rokopisom ne sme zajemati avtorjevih osebnih podatkov, prav tako ne imen ustanov, vključenih v pripravo rokopisa. Besedila naj bodo napisana z urejevalnikom besedil Word for Windows. Robovi naj bodo široki 25 mm, izberite črke Ariel in velikost črk 12. V Wordu uporabite možnost Postavitev strani/Številke vrstic/Zaporedno (tako bo na robu vsake vrstice rokopisa dodana številka vrstice, na katero se lahko referirajo recenzenti pri pisanju recenzij).

Rokopis naj ima naslednja poglavja: uvod, metode, rezultati, razprava, zaključek in reference. Vabljeni uvodniki so lahko zasnovani drugače, vendar naj bo razdelitev na poglavja in podpoglavja jasno razvidna iz odebelitve črk v naslovih. Poglavja in podpoglavja naj bodo številčena dekadno po standardu SIST ISO 2145 in SIST ISO 690 (npr. 1, 1.1, 1.1.1 itd.).

Kraticam in okrajšavam se izogibajte, izjema so mednarodno veljavne oznake merskih enot. Na mestu, kjer se kratica prvič pojavi v besedilu, naj bo izraz, ki ga nadomešča, polno izpisan, v nadaljnjem besedilu uporabljano kratico navajajte v oklepaju.

Grafično in slikovno gradivo vključite v besedilo na mesto, kamor le-to sodi in ga opremite z naslovi in legendami, v katerih pojasnite okrajšave. Uporabite črno-bele prikaze, ozadje naj bo vselej belo. Črke, številke ali simboli na slikah naj bodo jasni, enotni in dovolj veliki, da so berljivi tudi na pomanjšanem prikazu.

Merske enote naj bodo v skladu z mednarodnim sistemom enot (SI).

Zahtevana dolžina rokopisa je za vabljeni uvodnik od 250 do 2000 besed, za ostale vrste rokopisov pa od 2000 do 4500 besed s slikovnim gradivom in literaturo vred. Revizija sme obsegati 5000 besed.

Reference: Zdravstveno varstvo uporablja Vancouverski numerični stil citiranja in navajanja literature, ki je v biomedicini splošno v uporabi. Urejeni citati si v seznamu literature na koncu rokopisa sledijo zaporedno, kot so zapisani v besedilu rokopisa. V to zaporedje vključite tudi citate, ki se pojavljajo v tabelah, njihovih legendah ali v slikovnem gradivu. Za citiranje in navajanje literature ne uporabljajte opomb pod črto. Izogibajte se citiranju osebnih pogovorov, neobjavljenih podatkov in rokopisov, ki so v uredniškem postopku.

Citiranje v besedilu: Vsako navajanje trditev ali dognanj drugih avtorjev morate podpreti s citatom. Številka reference naj bo navedena v običajni velikosti na koncu citirane trditve v okroglih oklepajih. Uporbljajte arabske številke, navedete lahko tudi stran citata:

Adam et al. state that the data is 'unreliable' (1, p. 122).
This argument is increasingly relevant to the topic (2, 3) …
Several studies (1, 4-8, 12) …

Seznam literature: Numerično urejen seznam literature poimenujte z besedo "References" in ga postavite na konec rokopisa. Avtorje beležite s priimkom in kraticami imena, med posameznimi avtorji postavite vejico.

Navedite imena vseh avtorjev; v primeru, da je avtorjev šest ali več, navedite prvih šest avtorjev in dodajte kratico et al. Naslov in podnaslov pišite z malimi začetnicami z izjemo prve besede in lastnih imen. Uporabljajte običajno pisavo in se izogibajte ležeči pisavi ali zapisu v navednicah. Naslove revij krajšajte tako kot baza Medline/PubMed. Popoln seznam kratic revij najdete na naslovu National Library of Medicine's List of Journals Indexed for Medline. Naslovov revij, katerih kratic v seznamu ni, ne krajšajte. Če ima objava DOI številko, jo navedite na koncu reference. Primeri navajanja najbolj pogosto uporabljanih vrst objav:

Članek v reviji

Vodička S, Zelko E. Remote consultations in general practice: A systematic review. Zdr Varst. 2022 Sep 28;61(4):224-230. doi: 10.2478/sjph-2022-0030.

de Villiers TJ. The role of menopausal hormone therapy in the management of osteoporosis. Climacteric. 2015;18 Suppl 2:19-21. doi: 10.3109/13697137.2015.1099806.

Knjiga

Wilkinson IB, Raine T, Wiles K, Goodhart A, Hall C, O'Neill H, et al. Oxford handbook of clinical medicine. 10th ed. Oxford: Oxford University Press; 2017. 123 p.

Kaplan SJ. Post-hospital home health care: the elderly's access and utilization [dissertation]. St. Louis (MO): Washington University; 1995.

Poglavje v knjigi

Goldberg BW. Population-based health care. In: Taylor RB, Robin S, editors. Family medicine. 5th ed. Cambridge: Cambridge University Press; 1999. p. 32-36.

Spletna stran

Cancer Research UK. Current research into breast cancer [Internet]. 2020 [cited 2022 Dec 14]. Available from: https://www.cancerresearchuk.org/our-research/our-research-by-cancer-type/our-research-into-breast-cancer/current-breast-cancer-research

McNeil DG. Vaccines against HIV, malaria and tuberculosis unlikely, study says. New York Times. 2018 Sep 7. [cited 2018 Nov 14]. Available from: https://www.nytimes.com/2018/09/07/health/vaccines-hiv-malaria-tuberculosis.html

Primere navajanja redkeje uporabljanih vrst objav lahko najdete na spletni strani NLM knjižnice. Uredništvo pred objavo članka v reviji Zdravstveno varstvo seznam literature pregleda in ga po potrebi popravi v skladu z navodili. Za navajanje literature lahko uporabljate urejevalnike referenc, pri čemer izberete Vancouverski stil citiranja. Avtorjem priporočamo, da ob pripravi rokopisa pregledajo slovensko literaturo na temo svojega rokopisa, objavljeno v obdobju zadnjih petih let.

NASLOVNA STRAN

Naslovna stran naj zajema sledeče podatke: title / naslov, avtorji, zaposlitve, ORCID številke avtorjev, e-poštni naslov korespondenčnega avtorja, abstract / izvleček, keywords / ključne besede.

Naslov v angleškem in slovenskem jeziku naj bo informativen in natančen, opisen in ne trdilen (povedi v naslovih niso dopustne). V naslovu naj ne bo kratic.

Imena avtorjev naj bodo navedena v želenem zaporedju, dodani naj bodo popolni naslovi ustanov, kjer so avtorji zaposleni. Avtorji morajo izpolnjevati pogoje za avtorstvo. Prispevati morajo k zasnovi in oblikovanju oz. analizi in interpretaciji podatkov, rokopis morajo intelektualno zasnovati in ga kritično pregledati, strinjati se morajo s končno različico rokopisa. Zgolj zbiranje podatkov ne zadostuje za avtorstvo. Deljeno prvo avtorstvo je dovoljeno za največ dva avtorja. Dopišite ORCID številke avtorjev in e-poštni naslov korespondenčnega avtorja.

Izvleček v angleškem in slovenskem jeziku naj bo strukturiran v IMRC strukturi in naj ne bo daljši od 250 besed v angleščini in 400 besed v slovenščini. Izvleček pri vabljenih uvodnikih je lahko nestrukturiran. Izvleček naj vsebinsko povzema in ne le našteva bistvene vsebine rokopisa. Napisan naj bo v 3. osebi. Izogibajte se kraticam in okrajšavam.

Navedenih naj bo med 3 in 6 ključnih besed, ki bodo v pomoč pri indeksiranju.

ZAHVALA IN IZJAVE

Zahvala se naj nahaja na prvem mestu v dokumentu. Vsebuje naj zahvalo vsem sodelujočim pri rokopisu, ki niso prejeli avtorstva rokopisa.

Dokument naj nato zajema še sledeče izjave:

CONFLICTS OF INTEREST

(The authors declare that no conflicts of interest exist.)

FUNDING

(The study was financed by ...)

ETHICAL APPROVAL

(Received from the… ali opis etičnega vidika raziskave)

AVAILABILITY OF DATA AND MATERIALS

(All data and materials used in this study were collected from publicly available sources and are available upon reasonable request.
ali
Data sharing is not applicable to this article as no datasets were generated or analysed during the current study.)

LLM STATEMENT

(V LLM izjavi morajo avtorji obvezno navesti morebitno uporabo generativnih jezikovnih modelov (kot je ChatGTP) za izboljšanje jezika in berljivosti rokopisa. Primer: During the preparation of this work the author(s) used [NAME TOOL /SERVICE] in order to [REASON]. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.)

PREPRINT STATEMENT

Shranjevanje preprintov v priznanih repozitorijih preprintov, kot so bioRxiv, medRxiv in drugi akademski repozitoriji preprintov, je dovoljeno pred oddajo rokopisa v SJPH, vendar ne smejo biti objavljeni ali oddani v postopek še kje drugje.
Avtorji morajo v Izjavi o preprintih navesti obstoj preprinta. Navedite ime strežnika preprintov in DOI ali URL preprinta. Primer: The preprint has been deposited in a preprint server Research Square, and is available from https://www.researchsquare.com/article/rs-2351315/v2.
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Za SJPH javni komentarji o preprintih niso sprejemljivi kot recenzije.
Po sprejemu rokopisa v objavo v naši reviji in pred samo objavo morajo avtorji povezati preprint s sprejetim člankom z DOI številko.
Priporočljivo je, da avtorji citirajo končno objavljeno različico dela, ne preprinta.

Raziskave na ljudeh (vključno s človeškimi materiali in osebnimi podatki) morajo biti izpeljane v skladu s Helsinško deklaracijo in potrjene s strani nacionalne etične komisije. V izjavi o etiki morajo avtorji podati izjavo o etiki raziskav na ljudeh, ki mora vsebovati ime etične komisije in referenčno številko obravnave. Poročanje o raziskavah na ljudeh brez potrdila etične komisije zahteva dodatno razlago v poglavju o metodah dela. Na zahtevo Uredništva je avtor dolžan predložiti vso dokumentacijo o obravnavi raziskovalne etike njegovega rokopisa. Uredništvo si pridržuje pravico, da kontaktira etično komisijo.

Prav tako morajo avtorji, ki poročajo o ljudeh ali posredujejo javnosti njihovo slikovno gradivo, pridobiti dovoljenja vseh sodelujočih, da se z vključitvijo v raziskavo strinjajo (v primeru otrok so to starši ali skrbniki). Izjavo o pridobitvi teh dovoljenj morajo avtorji podati v poglavju o metodah dela. Uredništvo si pridržuje pravico vpogleda v to dokumentacijo.

Raziskave na živalih morajo biti izpeljane v skladu z navodili “Animal Research: Reporting in Vivo Experiments”-(ARRIVE) in potrjene s strani nacionalne etične komisije. V poglavju o metodah dela in med izjavami morajo avtorji podati izjavo o etiki raziskav na živalih z veljavno številko dovoljenja.

V izjavah morajo biti zapisani morebitni finančni ali drugi interesi farmacevtske industrije ali proizvajalcev opreme ter inštitucij, povezanih z rokopisom.

Primere priponk najdete na spletni strani revije.

UREDNIŠKO DELO

Prispele rokopise z javnozdravstveno tematiko mednarodnega pomena posreduje uredništvo po tehnični brezhibnosti in plagiatorskem pregledu s programom Crossref Ithenticate (če uredništvo ugotovi, da je rokopis plagiat, se rokopis takoj izloči iz uredniškega postopka) v pregled dvema urednikoma. Če je rokopis ocenjen kot vreden recenzentskega postopka, ga uredništvo pošlje v recenzijo trem mednarodno priznanim recenzentom, vsej eden mora biti iz tujine. Recenzijski postopek je dvojno slep. Po končanem recenzentskem postopku vrnemo rokopis korespondenčnemu avtorju, da popravke upošteva. Revizijo rokopisa vrne avtor v aplikacijo Editorial Manager. Uredništvo dopušča obravnavo največ treh revizij. Če tretja revizija rokopisa ne upošteva vseh pripomb recenzentov, se rokopis umakne iz uredniškega postopka. Po sprejemu rokopisa sledi jezikovna lektura. Med redakcijskim postopkom je zagotovljena tajnost vsebine rokopisa. Avtor dobi v pogled tudi prve, t. i. krtačne odtise, vendar na tej stopnji upoštevamo le še popravke tiskarskih napak. Krtačne odtise je potrebno vrniti v treh dneh, sicer menimo, da avtor nima pripomb.

V uredništvu se trudimo za čim hitrejši uredniški postopek. Avtorji se morajo držati rokov, ki jih dobijo v dopisih, sicer se lahko zgodi, da bo rokopis umaknjen iz postopka.

Morebitne pritožbe avtorjev obravnava uredniški odbor revije.

Za objavo članka prenesejo avtorji avtorske pravice na založnika, torej na Nacionalni inštitut za javno zdravje in podpišejo Pogodbe o avtorstvu in prenosu avtorskih pravic. Kršenje avtorskih in drugih sorodnih pravic je kaznivo.

Člankov in recenzij ne honoriramo. Stroškov obravnave rokopisov in objave člankov avtorjem ne zaračunavamo.

Revija Zdravstveno varstvo je na spletu prosto dostopna. Avtorji prejmejo tudi avtorske izvode tiskane revije, v kateri je objavljen njihov članek.

Če pri oddajanju rokopisa naletite na nepremostljive težave, se za pomoč prosim obrnite na naslov uredništva zdrav.var@nijz.si.

VARSTVO

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