

EVALUATION OF ACCESS TO LONG-TERM CARE SERVICES FOR OLD PEOPLE AGEING IN PLACE IN SLOVENIA

OVREDNOTENJE DOSTOPA DO STORITEV DOLGOTRAJNE OSKRBE LJUDI, KI SE STARAJO V DOMAČEM OKOLJU V SLOVENIJI

Valentina HLEBEC^{1,2*}

¹University of Ljubljana, Faculty of Social Sciences, Kardeljeva pl. 5, 1000 Ljubljana, Slovenia

²Faculty of Health Sciences, Zdravstvena pot 5, 1000 Ljubljana, Slovenia

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ABSTRACT

Keywords:

access, long-term care, informal carers, aging in place, regression analysis

Theory: The quality of long-term care services has an important effect on the quality of life of their users and their informal carers. By identifying gaps between provision of services and users' needs we can suggest adjustments of the long-term care services and advance their development.

Method: The data from the first Slovenian national survey of social homocare (SHC) users and their informal carers was utilised. Linear regression analysis was used to evaluate factors that affect assessments of five-dimensional concept of access.

Results: On average, affordability was rated the lowest (mean=2.9) and acceptability the highest (4.0), with availability, accessibility and accommodation (mean=3.6) in the middle. Regression analysis explains 15% of variability in affordability, while for other dimensions much less. Caregiver's needs are the most influential predictor of access, negatively influencing the rating of access (availability $B=-.127$, accommodation $B=-.113$, acceptability $B=-.120$, affordability $B=-.155$). Care recipients' needs also affect the rating of affordability ($B=-.132$). Family income negatively influences the rating of availability ($B=-.115$), accessibility ($B=-.076$) and affordability ($B=-.270$). Residents of rural areas rate availability ($B=-.070$) and affordability ($B=-.067$) less favourable.

Discussion: This study showed that affordability is rated the least favourable among components of access. Adjustment in private out-of-pocket co-payment mechanism is suggested.

IZVLEČEK

Ključne besede:

dostop, dolgotrajna oskrba, neformalni oskrbovalci, regresijska analiza, staranje doma

Teorija: Kakovost storitev dolgotrajne oskrbe vpliva na kakovost življenja uporabnikov in njihovih oskrbovalcev. Evalvacije lahko pokažejo neskladja med ponudbo storitev in potrebami uporabnikov in tako omogočijo korekcije storitev ter spodbudijo njihov razvoj.

Metoda: Podatke prve raziskave uporabnikov socialne oskrbe na domu in njihovih neformalnih oskrbovalcev smo uporabili za evalvacijo petih teoretsko definiranih razsežnosti dostopa. Uporabili smo linearno regresijsko analizo.

Rezultati: Cenovna dostopnost je bila v poprečju najslabše ocenjena (povprečje = 2,9), raven sprejemljivosti pa najvišje (4,0), razpoložljivost storitev, stopnja dostopnosti in ustreznost organiziranosti so bile v sredini (3,6). Z regresijskim modelom smo pojasnili 15-odstotno variabilnost v stopnji cenovne dostopnosti, ostale razsežnosti dostopa pa precej manj. Oskrbovančeve potrebe so bile najbolj vplivna determinanta, ki ima negativen vpliv na štiri razsežnosti dostopa (stopnja razpoložljivosti $B = -,127$, ustreznost organiziranosti $B = -,113$, raven sprejemljivosti $B = -,120$, cenovna dostopnost $B = -,155$). Na cenovno dostopnost značilno vplivajo tudi potrebe oskrbovancev ($B = -,132$). Družinski dohodki negativno vplivajo na oceno razpoložljivosti storitev ($B = -,115$), stopnjo dostopnosti ($B = -,076$) in na cenovno dostopnost ($B = -,270$). Prebivalci ruralnih območij nižje ocenjujejo stopnjo razpoložljivosti ($B = -,070$) in cenovno dostopnost ($B = -,067$).

Razprava: Pokazali smo, da je cenovna dostopnost najslabše ocenjena razsežnost dostopa. Predlagamo prilagoditev finančnih mehanizmov pri določanju višine plačila storitev.

*Corresponding author: Tel. + 386 1 58 05 284; E-mail: valentina.hlebec@fdv.uni-lj.si

1 INTRODUCTION

The purpose of this paper is to examine how informal carers of old people, ageing in place, and using an array of formal long-term services (LTC) in community in Slovenia, evaluate access to formal LTC, used by older people. To this purpose, we explore and operationalise the theoretical five-dimensional (availability, accessibility, accommodation, affordability, acceptability) model of access by Penchansky and Thomas (1, 2). Specifically, we observe perceptions of informal carers of older people, as most often they are the ones who organise and assist access to formal LTC services and are well aware of their characteristics. Their views are especially important regarding the absence of one entry point to LTC services and longstanding division of health and social protection systems in Slovenia, which is pertinent in LTC (3-6). Access to LTC is an important issue in Eastern and Central European countries (3-5), so this study will contribute to understanding the user experience in a broader geographical area. The paper is structured as follows. First, we present major characteristics of Slovenian LTC delivery; this is then followed by a description of the five-dimensional model of access and an outline of hypotheses on the basis of literature review.

The percentage of private, out-of-pocket expenditure for formal LTC services in Slovenia is ranking the fourth in Europe, as 24% of all costs for the services consists of private out-of-pocket contribution (3). LTC expenditure represents 1% of GDP and 70% of the budget is allocated to health care (7). Altogether, 6.7% of population aged 65+ receives LTC, and among them, the majority (75%) receives institutional care (3). Compared to other European countries, this is a unique situation, as in all countries for which data is available, the majority of users receive LTC at home (3). This specific composition of Slovenian LTC may be partially explained by historical reasons, as institutional care has a long tradition in Slovenia (4), and formal services for old people aging in place became available more recently (3-6). How users of Slovenian LTC services and their informal carers perceive its quality is so far known only from descriptive comparative research (3). European Quality of Life Survey (EQLS) shows that Slovenia is the third country in Europe, ranking in difficulties to the access to long-term care (3). Nearly all users of LTC services state that they encounter difficulties with access (89% - report affordability as an issue, 84% availability (waiting lists, lack of services) and 60% accessibility - distance or opening hours as a source of barriers to access). Quality of care is rated more favourable, as only 46% report quality as difficulty related to LTC services, which is about EU average. It is therefore important to explore in detail how users of formal LTC services and their informal carers perceive their quality.

The theoretical model of five dimensions of access has been proposed already in 1980s (1, 2), and often utilised in research on the quality of LTC or individual services (13-26). Access is broadly defined as fit between peoples' (users or patients) needs and expectations, and services (e.g. health or LTC) that are offered to them in their community or region (1, 2). Availability refers to the relationship between volume and types of services and resources that are offered by the system and users' needs (1, 2). We refer to formal LTC services as the system in this study. Accessibility is fit or distance between location of service and location of users (1, 2). It includes geographical distance between service provider and users' homes, and includes all resources that are needed for users to reach the facilities, such as transfer costs and time spent on the voyage (1, 2). Waiting time between the initial contact between service provider and user and the date of actual service is also included in accessibility (1, 2). Accommodation refers to the quality of the organisation of the services, such as parking spaces, appointment system (phone, in person, the Internet), opening hours, time spent in the waiting room. Satisfaction of users with accommodation shows how suitable these characteristics of service provision are and how much they are a match to expectations of users (1, 2). Affordability refers to fit between total costs of the system and users' ability to contribute to the costs either via insurances, taxes, or with direct out-of-pocket private co-payment (1, 2). Acceptability measures the fit between characteristics of service providers, such as their race, ethnicity, gender, attitude, professionalism, language, etc. (1, 2). Problems with access will influence users as well as the services in three ways, namely: the usage of the services will be lower, users will be less satisfied with services and provider practice patterns may be inadequate or less than optimal (1, 2).

Very often, the usage of services of LTC, access and barriers to access are evaluated from the point of view of users and their informal carers at the same time (13, 14, 18, 22, 23). Quite often, access is evaluated from the perspective of users of services of LTC (16, 18, 21) or informal carers (24-26) or even from the perspective of professional carers (19). Both qualitative (18-20, 22, 25, 27-30) and quantitative (15, 17, 21, 31) approaches were found in the literature, and we tried to take into account evidence from both types of studies to postulate our hypotheses about access to long-term care services for older people, ageing in place in Slovenia.

At the end of each following paragraph we outline a hypothesis, based on literature review of articles presented in this paragraph. Rural areas are characterised by lower availability and accessibility of services (15, 29, 31-33). Low awareness and lack of information about

services among potential users and their informal carers, and reluctance to use formal services were also identified among barriers (16, 29). Insufficient public transport in rural areas was found to be a significant barrier to access to health services, which is important for older people aging in place and their informal carers (32). Gaps in services provision were related to timing of the service or to the ways service was organised around an individual user (16, 29, 33). This accumulation of barriers to access to LTC in rural areas would result in systematic perception of lower access to services across all five dimensions of access also in the Slovenian context.

Inadequate attitude by formal carer or physician, her/his lack of communication skills or failure to provide information was also identified as a factor that has a negative effect on the perception of access for all dimensions of access (15, 33). Considering that the quality of LTC was rated as relatively good by EQLS, we expect favourable evaluations of quality of service provision in Slovenia, measured as acceptability and accommodation, as opposed to other dimensions.

Need of care recipient and informal carer, taking into account both illnesses and disabilities as well as psychological impairment, such as problems with memory, would increase the usage of formal services (15, 21, 31, 33). We hypothesise that informal carers with higher amount of illnesses and disabilities rate access to LTC services across all dimension of access lower than respondents with lower amount of illnesses and disabilities.

Financial constraints are an obvious barrier to the access to any kind of service that requires out-of-pocket private contribution, both in rural and urban areas, as well as taking individual or household income into account (15, 26, 29, 31-33). The type of relationship between informal carer and care recipient(s) is also important, as children are more often found to facilitate the usage of formal services than spouses (16, 26, 31, 33), and male carers more often than female carers (16, 26, 33). Education also fosters the usage of formal services (21, 31), and more educated carers may have higher expectations about service provision and service quality, and thus rate access less favourably than informal carers with lower education. We hypothesise that affordability of the LTC services rates the least favourable among all components of access, and that the evaluations will be negatively associated with higher care needs of care recipients and caregivers with lower income and higher education.

2 METHODS

2.1 Subjects and Procedure

Data for this study were drawn from the first Slovenian national survey of social homecare (SHC) users in 2013. Stratified random sampling was applied to obtain a representative sample of service users and service providers. At the same time, informal carers of users of SHC were invited to participate in the survey. 1151 informal carers participated in the survey. The partial non-response is related to self-administered paper and pencil data collection and is explained in more detail in (9). The subjects of the paper are informal carers of old people who age in place and use formal LTC services.

2.2 Instruments

In the present study, we analysed the perception of accessibility of Slovenian LTC services from the perspective of informal carers of users of formal LTC. We designed a multi-item questionnaire according to the theoretical model of access defined by Thomas and Penchansky (1, 2), and examined its multidimensionality with factor analysis (principal axis, oblimin rotation). The questionnaire measures five dimensions of access, evaluating availability, accessibility, accommodation, affordability and acceptability. Likert indexes were calculated on the basis of dimensionality shown by factor analyses, resulting in five indexes of interval measurement scale as dependent variables. Respondents were prompted to consider all LTC services used by the care recipients (i.e., health services, such as visiting the general practitioner or some other specialist, visit of community nurse or social home carer).

2.3 Hypotheses

All hypotheses were elaborated on the basis of literature review, presented in theoretical introduction. We considered findings from available quantitative and qualitative studies on access to LTC services and applied them to Slovenian LTC.

H1: Among dimensions of access, acceptability should be, on average, rated the highest and affordability the lowest.

H2: Increasing need of informal caregivers and care recipients would decrease satisfaction with access to LTC services across all dimension of access.

H3: Personal characteristics of informal caregivers will affect mostly affordability. Having difficulties to manage with family income, higher education, younger age, being partner carer as opposed to child carer would all decrease perception of access.

H4: Across all dimensions of access, informal carers from rural settlements would rate access less favourable.

2.4 Dependent and Independent Variables

The dependent variables are Likert indexes of five conceptual dimensions of access to LTC services (availability, accessibility, accommodation, affordability and acceptability on an interval scale, ranging from 1 to 5). Independent variables were selected according to theoretical and empirical studies presented in Introduction. Owing to limitations in the questionnaire, some were assessed as proxies (e.g. income). We included care recipient's (CR) subjective perception of impairments, illnesses and disabilities that limit daily life activities and problems with memory. We also included informal carers' (IC) perception of their own health, their demographic characteristics, the number of care recipients (informal caregiver may provide care to multiple care recipients) and scope and intensity of care provided to care recipients across 22 activities of daily living (personal, instrumental and advanced activities of daily living), the type of settlement and geographical distance between informal caregiver and care recipient. Ordinal variables were transformed to dummy variables, in order to estimate multiple linear regression analysis.

Model

CR_1 - existence of long-term physical or psychological impairments, illness or disability that limits care recipients in daily life activities (0 - none or one, 1 - more)

CR_2 - problems with memory (0 - none, some, 1 - considerable)

IC_3 - age

IC_4 - gender (0 - female, 1 male)

IC_5 - education (0 - vocational school or less, 1 high school or more)

IC_6 - evaluation of family income (0 - we can (easily) manage with our family income, 1 - it is (very) difficult to manage with our family income)

IC_7 - multiple care provision (the number of care recipients to whom care giver provides informal care)

IC_8 - health problems of IC (Liker scale of reported health issues by caregiver)

IC_9 - scope and intensity of care provided to care recipients across activities of daily living (sum of three Likert scales, one for each of types of activities of daily living; that is, personal, instrumental and advanced activities of daily living; thus, ranging between 3 and 15)

IC_10 - urban vs rural settlement (0 urban, 1 - rural)

IC_11 - geographical distance between care giver and care recipients (0 - the same household, 1 - less than 15 min drive, 2 - more than 15 min drive)

2.5 Data Analysis

Multiple linear regression analysis was used. We examined quality parameters for multiple linear regression analysis.

Standardised residuals were normally distributed, except for acceptability, and in order to keep all five dimensions comparable, we have chosen not to transform the acceptability scale. There were no heteroscedasticity or multicollinearity.

Model 1-5:

$$Y_i = b_0 + b_1X_{1i} + b_2X_{2i} + \dots + b_{11}X_{11i} + e$$

Y_i = access to LTC services

b_0 = intercept

b_i = regression coefficients

X_i = independent variables

e = error

3 RESULTS

Table 1. Descriptive statistics.

	N	Mean	St. Dev.	Min	Max
Availability	698	3.58	.72	1	5
Accessibility	606	3.62	.69	1.25	5
Accommodation	563	3.55	.67	1.25	5
Acceptability	646	4.02	.55	2	5
Affordability	623	2.90	.82	1	5
IC Age	1097	60.20	14.80	20	97
IC Number of care recipients	1151	.97	.73	0	5
IC Scope and intensity of informal care	1033	8.09	3.51	3	15
IC Health problems	1092	2.17	.93	1	5

IC - informal carer

Table 2. Descriptive statistics II.

		N	%
CR Long term disability	0 - None or one	994	36.7
	1 - More		63.3
CR Difficulties with memory	0 - None, some	1005	67.8
	1 - Considerable		32.2
IC Gender	0 Female	1126	62.6
	1 Male		37.4
IC Education	0 - Vocational school or less	961	30.7
	1 High school or more		69.3
IC Evaluation of family income	0 - We can (easily) manage with our family income	933	78.1
	1 - It is (very) difficult to manage with our family income		21.9
IC Settlement	0 -Urban	1039	47.6
	1 - Rural		52.4
Geographical distance between IC and CR	0 - The same household	1003	61.1
	1 - Less than 15 min drive		27.9
	2 - more than 15 min drive		11.1

IC - informal carer; CR care recipient

Evaluations of five dimensions of access considerably vary on average since the mean acceptability is very high (4.02) and affordability quite low (2.90). Informal carers of users of social home care are, on average, 60 years old, in majority they are women (62.6%), in majority they can manage with family income, in majority they have completed high school (69.3%), and they report a lower level of scope and intensity of their own health issues on average (2.17). They provide a substantial amount of informal care to care recipients who mostly reside in their

own households (61.1%). The majority of care recipients have two or more long-term physical or psychological impairments, illnesses or disabilities that limit them in daily life activities, and about 30% have severe memory problems.

Table 3. Results of multiple linear regression analysis.

Predictor variables	Availability		Accessibility		Accommodation		Acceptability		Affordability	
	b	B	b	B	b	B	b	B	b	B
Constant	3.814		3.833		3.797		.143		3.197	
CR Long term disability	.044	.029	.031	.022	-.068	-.048	.003	.002	-.226	-.132 ^c
CR Difficulties with memory	-.081	-.052	-.091	-.062	.013	.009	-.045	-.021	-.069	-.039
IC Gender	.011	.007	-.057	-.040	-.066	-.047	.024	.012	-.039	-.023
IC Age	.000	.004	.001	.012	.001	.025	.002	.023	.004	.077 ^a
IC Education	-.050	-.032	-.040	-.027	-.111	-.076	-.071	-.033	-.070	-.039
IC Evaluation of family income	-.201	-.115 ^b	-.127	-.076 ^a	-.107	-.066	-.039	-.016	-.538	-.270 ^c
IC Number of care recipients	.016	.016	-.009	-.010	.040	.044	.007	.005	.085	.076 ^a
IC Health problems	-.099	-.127 ^b	-.049	-.066	-.082	-.113 ^a	-.129	-.120 ^a	-.137	-.155 ^c
IC scope and intensity of care	.012	.057	-.004	-.022	-.004	-.019	.006	.022	.009	.036
IC settlement	-.102	-.070 ^a	.042	.031	-.036	-.027	.069	.035	-.111	-.067
Geographical distance btw IC and CR	-.041	-.039	-.063	-.063	.072	.073	.023	.016	-.015	-.012
R ²	.039		.022		.036		.017		.148	
F/p	2.229	.012	1.074	.380	1.753	.060	.899	.541	8.674	.000

b - unstandardised regression coefficients; B - standardised regression coefficients; * a ≤ 0.05; ** b ≤ 0.01; *** c ≤ 0.001; IC - informal carer; CR care recipient

Models for five dimensions of access perform differently, as the proportion of explained variance in access varies between 2 and 15 percent. The smallest amount of explained variance was found for accessibility and acceptability, whereas the biggest amount of explained variance was found for affordability.

Perception of availability of LTC services is significantly influenced by evaluation of family income, informal caregivers' health and type of settlement. Informal carers, reporting difficulties with family income, would rate LTC services as less available (unstandardised regression coefficient b=-.201). Similarly, if they reported a higher degree of their own health problems (b=-.127) and if they are living in a rural area (b=-.102), they rate the availability less favourably. Perception of accessibility is only affected by evaluation of family income. Informal carers reporting difficulties with family income would rate LTC services as less accessible (unstandardised regression coefficient b=-.127). Perception of accommodation is only affected by informal carers' health problems (b=-.082), similarly as acceptability (b=-.129). Perception of affordability is affected by a number of variables, including care recipient's health (b=-.226). Perception of affordability increases with informal caregivers' age (b=.004) and the number of care recipients (b=.085). Perception of affordability decreases with informal carers' difficulties with family income (b=-.538), informal carers' own health problems (b=-.137) and living in a rural area

(b=-.111). Among predictors, needs of care recipient and informal caregiver and evaluation of family income are among the strongest predictors of access (as suggested by standardised regression coefficients - B), followed by type of settlement, care recipients' age and number of care recipients.

4 DISCUSSION

The purpose of this study was to evaluate access to Slovenian LTC services for old people residing in community. As predicted, financial access or affordability was rated the lowest. Similarly as in other countries, affordability of the LTC services is an important issue to its users and their informal carers (15, 26, 29, 31-33). Financial resources obviously represent a persistent and universal barrier to the usage of formal LTC.

Disparities which were observed between rural and urban settlements are not surprising, as they are observed in other countries as well (15, 26, 29, 31-33, 35). Financial constraints most likely enhance lower availability of services in rural areas and higher probability of having unmet needs (35). Informal care is related to the lack of financial resources, while the usage of formal services is often related to the financial status of care recipients and their families (34).

Even though financial coverage by insurance reduces financial barriers to LTC services, organisational and geographic barriers will probably persist, similarly as suggested by previous research (15), unless they are specifically addressed by policy makers.

We are less than satisfied with the performance of our appraisal questionnaire, even though all five dimensions of access were addressed explicitly. We acknowledge the lower percentage of explained variability. Quite likely, affordability is an issue that is more important for social care, whereas availability and accessibility are issues that are more important for health segment of the LTC services in Slovenia. This assumption is based on the fact that health care part of long-term care is financed with insurance mechanism, while the social services part of the long-term care requires high out-of-pocket private contributions from users and their families.

5 CONCLUSION

As our findings show affordability as the least favourable aspect of access, we advocate for reconsidering the co-payment policy for social home care in such a way that would consider financial situation of users and their families.

Apart from general evaluations of long-term services, there is need for additional exploration of this field in Slovenia. Little is known about respite care or other services designed for informal carers in Slovenia, regardless of their beneficial effects on informal carers of LTC recipients (14, 17), and we encourage in-depth evaluations of services that are available in Slovenia. There is very little known about different experiences in accessing services of male and female family carers (27) and more research is needed to better understand their caring experiences. There is persistent encouragement for co-ordination and integration of LTC services (20, 22), as integrated services guarantee better care to end users and their informal carers.

CONFLICTS OF INTEREST

The authors declare that no conflicts of interest exist.

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ETHICAL APPROVAL

Informed consent to participate principle was applied.

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FUTURE TEACHERS' ATTITUDES AND KNOWLEDGE REGARDING THE MANAGEMENT OF THE POTENTIAL STUDENTS' LIFE-THREATENING ALLERGIC REACTIONS IN SLOVENIAN SCHOOLS

ODNOS PRIHODNIH UČITELJEV DO UKREPANJA OB POTENCIALNO ŽIVLJENJE OGROŽAJOČIH ALERGIJSKIH REAKCIJAH UČENCEV V SLOVENSkih ŠOLAH IN ZNANJE PRIHODNIH UČITELJEV O TEM

Iztok DEVETAK^{1*}, Sonja POSEGA DEVETAK², Tina VESEL³

¹University of Ljubljana, Faculty of Education, Department of Biology, Chemistry and Home Economics, Kardeljeva pl. 16, 1000 Ljubljana, Slovenia

²General and Teaching Hospital Izola, Department of Paediatrics, Polje 40, 6310 Izola, Slovenia

³University Medical Centre Ljubljana, University Children's Hospital, Department of Allergology, Rheumatology and Clinical Immunology, Bohoričeva 20, 1000 Ljubljana, Slovenia

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ABSTRACT

Introduction: Poorly developed teachers' competences for managing children's allergies can pose a significant problem for the wellbeing of children in the preschool and school environment. The purpose of this study is to explore the attitudes and theoretical understanding of the management of allergic reactions in children among future teachers.

Keywords:

allergic children, allergy and anaphylaxis management, attitude, basic knowledge, future teachers

Methods: A total of 572 future teachers participated in the study, 56% of whom were in the 1st year of undergraduate educational programmes, while 44% were in the 4th year. The participants answered the Teachers' Health Competences Development - Allergy Questionnaire.

Results: The future teachers showed positive attitudes towards learning more about different child health issues. There was an average understanding of managing allergic reactions in children (59.4%; SD=16.1% success), with no statistically significant difference regarding the duration of education, science background or the students' self-allergy. There was, however, a statistically significant difference in achievement scores between future teachers in different educational programmes ($F(3,568)=6.4$, $p \leq 0.000$). A subgroup of future teachers exposed to basic allergy education in the 1st year and tested again in the 4th year showed significantly better knowledge ($Mann-Whitney U=83.0$; $p=0.008$).

Conclusion: The duration of future education, science background and self-allergy did not influence the level of knowledge regarding the management of allergic reactions in children. A basic educational programme in allergy management had a positive effect on future teachers' knowledge of managing allergic reactions in children. Our study indicates that all future teachers should be included in specific educational programmes in order to develop adequate health competences.

IZVLEČEK

Uvod: Slabo razvite vzgojiteljeve in učiteljeve kompetence o ukrepanju pri alergijah učencev lahko pomenijo veliko težavo pri zagotavljanju varnosti otrok v vrtcih in šolah. Namen te raziskave je ugotoviti odnos prihodnjih učiteljev do ukrepanja ob alergijskih reakcijah učencev in njihovo razumevanje tega problema.

Ključne besede:

otroci z alergijo, ukrepanje ob alergiji in anafilaksiji, odnos, osnovno znanje, študenti pedagoških študijskih programov

Metode: V raziskavi je sodelovalo skupno 572 prihodnjih učiteljev, od tega 56 % študentov prvega letnika in 44 % četrtega (zadnjega) letnika dodiplomskega študija. Udeleženci so izpolnjevali vprašalnik Učiteljeve zdravstvene kompetence - alergije, ki je vseboval del o poznavanju ukrepov ob alergijskih reakcijah otrok ter postavke o odnosu do tega področja.

Rezultati: Prihodnji učitelji so pokazali pozitiven odnos do učenja o zdravstvenih temah, ki se nanašajo na šolske otroke. Rezultati kažejo povprečno razumevanje ukrepov ob alergijski reakciji pri otrocih (povprečno število doseženih točk je 59,4 %; SD = 16,1 %), vendar razlike niso statistično pomembne glede na trajanje univerzitetnega izobraževanja, obiskovanje katerega od naravoslovnih predmetov med študijem ali glede na to, ali so anketiranci sami alergiki ali ne. Obstaja pa statistično pomembna razlika v dosežkih na preizkusu znanja o ukrepanju pri alergijah med študenti glede na smer študija ($F(3,568) = 6,4$; $p \leq 0,000$). Podskupina študentov, ki so bili izpostavljeni osnovnemu izobraževanju s področja ukrepanja pri alergijskih reakcijah v prvem letniku študija in katerih znanje je bilo ponovno preverjeno v četrtem letniku, so izkazali pomembno boljše znanje od tistih, ki se o alergijskih boleznih niso dodatno izobraževali ($Mann-Whitney; U = 83,0$; $p = 0,008$).

Zaključek: Na znanje o tej problematiki nimajo vpliva trajanje univerzitetnega izobraževanja, ali so študenti na dodiplomskem študiju imeli predmet(-e) z naravoslovnimi osnovami ter ali so poročali o tem, da so tudi sami alergiki. Osnovni izobraževalni program o ukrepanju pri alergijah ima pozitivne učinke na znanje prihodnjih učiteljev o tej tematiki. Ta raziskava kaže, da je v vse dodiplomske ali podiplomske pedagoške programe treba vključiti specifično izobraževanje o zdravstvenih temah otrok zato, da bi vzgojitelji in učitelji razvili ustrezne kompetence o ukrepanju v specifičnih situacijah, povezanih z zdravstvenim stanjem otrok v predšolskem ali šolskem okolju.

*Corresponding author: Tel. + 386 1 58 92 204; E-mail: iztok.devetak@pef.uni-lj.si

1 INTRODUCTION

Allergic reactions in children are an important health issue in kindergarten and school settings (1, 2). They can manifest in multiple ways, including life-threatening anaphylaxis (3). Between 10% and 18% of children with food allergy experience various allergic reactions to food, including anaphylaxis, at school (3-5). According to data from the United Kingdom, 61% of schools have at least one child at risk of anaphylaxis (6). Food allergy, which affects 4-7% of primary school children in Europe, is the most frequent cause of anaphylaxis in children (1).

Poorly developed teachers' competences for managing children's allergies can pose a significant problem to the wellbeing of children in the preschool and school environments. Several studies (7-12), including the Europrevall study (13), have revealed a low level of preparedness for managing children at risk of anaphylaxis in kindergartens and schools. The importance of the knowledge of school personnel in recognising children's allergic reactions and providing first aid is pointed out in recommendations of the EAACI (European Academy of Allergology and Clinical Immunology) (1, 2) and others (14, 15). These documents also emphasise the importance of the continuous education of teachers and all other school personnel in managing allergic reactions in school (1, 2). However, trials of the efficiency of different models for improving the knowledge of children's caregivers regarding recognising and treating severe allergic reactions are rare (2). It has been shown that education in managing children's allergic reactions results in improved knowledge of parents and kindergarten or school employees (16-20), but there is a lack of reports on the long-term efficacy of a coordinated and achievable teaching approach (2).

In Slovenia, courses in allergy management are provided for kindergarten/school personnel, but there is no law to regulate what is expected from the teachers, although parents, public and medical personnel expect from teachers to be able to manage children's allergic reactions. The preliminary results are promising, with participants reporting enhanced theoretical ability, a willingness to undertake appropriate first-line management of anaphylaxis in children and a sense of being able to do so (21). To put the need for implementing adequate educational models for teachers and future teachers (while they are educated at university to become teachers) into perspective, it should be pointed out that, in Slovenia, in recent years, adrenaline auto injectors (AAI) have been prescribed for 260-350 children per year, with

120-150 being prescribed for the first time (22). There are currently no nurses employed in kindergartens or schools in Slovenia, and they are therefore not able to be present at the time of the allergic reaction of a child. However, according to a comprehensive school health educational programme - Preventive Health Programmes for Children and Adolescents - developed by The National Institute of Public Health (NIJZ), registered nurses employed by local health institutions can be important stakeholders and providers of various health educational programmes when they are invited to the school (23). Future teachers are important stakeholders for successful education outcomes regarding developing competences for managing allergic children before they become teachers and engage in fulltime teaching in schools. According to the available literature, no research has been done on the knowledge and attitudes of future teachers regarding managing allergic children in the international context. However, some results indicating the problems regarding future teachers in Slovene context were already presented (24). In Slovenia, education on allergic reactions is currently routinely available only to future home economics teachers, who will also be responsible for planning and providing food for children in schools (24).

The aim of this study is therefore to provide proper evaluation of the current understanding of the management of allergic reactions in children (aged from 6 to 14) among future teachers, and to understand the impact of different factors (i.e., gender, study programme, participation in an allergy educational programme and attitude towards child health topics) on future teachers' knowledge and allergy management competences.

2 METHODS

2.1 Participants

A total of 454 of 1st year and 347 of 4th (last) year of undergraduate future teachers were enrolled in the study programs in the academic year 2014/15 at the Faculty of Education, University of Ljubljana. One of the researchers identified specific courses according to future teachers' schedules, and participants were recruited to fill-in the questionnaire during the lectures. The intention was to reach as many future teachers in the specific year of study as possible. Some of the future teachers declined to participate in the study, while others were absent during a particular class while gathering data. Altogether 572 future teachers participated in the study, 319 (56%) of the participants were enrolled in the 1st year and 253 (44%) in the 4th year.

2.2 Instrument

The participants completed the Teachers' Health Competences Development - Allergy Questionnaire (THCDAQ), which was developed specifically for this study, but some items were based on a questionnaire used by Polloni et al. (9) and adapted to the Slovenian context. The questionnaire was developed by a multidisciplinary team of experts from the field of paediatric allergology and science education. The THCDAQ was piloted and the final version used in the present study comprised a total of 34 multiple-choice and open-ended items, divided into four groups. The first part of the THCDAQ comprised six items about participants' general information. The second part comprised eleven Attitude items on Child Health issues (AMCH). In the third part, there are ten knowledge items on Managing Children's Allergic Disease (MCAD), including the prevention, recognition and management of anaphylaxis, asthma and food allergy. Finally, the fourth part of the questionnaire comprises seven items that measure future teachers' Self-Perceived Allergy Management Competences (SPAMC). The Slovenian version of the THCDAQ can be obtained from the authors. The content validity of the THCDAQ was confirmed by three independent experts in paediatric allergology and science education. Specific parts of the THCDAQ showed satisfactory internal consistency (Cronbach was between .51 and .76).

The MCAD part of the questionnaire was used to determine future teachers' knowledge about allergic reactions and for each multiple-choice question participants could achieve one point and max. 10 points could be achieved. Other parts of the questionnaire were used to determine the specific groups of future teachers and comparisons regarding the MCAD scores were done, and to identify specific attitudes and competences for managing children's allergic disease.

2.3 Research Design

The THCDAQ was applied anonymously in May 2015 in groups, and all of the participants had the same conditions for completing the questionnaire. The participants were informed that the data would be used for research purposes and the main objective of the study was explained. One subsample of home economics future teachers had received two hours of education on the management of food allergies and anaphylaxis as part of their obligatory course Physiology of Nutrition, taken in the first year of undergraduate education. Some 26 months later, in their 4th year of study, these future teachers have also participated in the present study and completed the THCDAQ.

The acquired data were analysed using SPSS 22. Descriptive statistics (mean *M*, median *Md*, standard deviations *SD* and interquartile ranges *IQR*) were applied to reveal the attitude, competence and knowledge characteristics of the participants. Inferential parametric (One-Way Analysis of Variance *ANOVA* and *T*-test) and nonparametric statistics (*Mann-Whitney U* test) were used to determine the significance of the differences between specific groups of future teachers. All the differences were presented at the .05 level of significance.

3 RESULTS

3.1 Study Group Description

The response rate was 70% for 1st year, and 73% for 4th year future teachers. Considering the sample, only 7% of participants were male and 93% were female. They had an average age of 21.5 years (*SD*=2.7). 41.8% of the participants were enrolled in undergraduate programmes with a science background (i.e., two-subject future teachers of biology, chemistry, physics and home economics, as well as future primary school teachers, whose programme includes some basic biology, chemistry and physics). The others (58.2%) had no science courses. 15.6% of the participants were studying to become pre-school teachers (Group 1), 21.9% to become subject teachers (Group 2), 33% to become social pedagogues, special education or art teachers (Group 3), and 29.5% to become primary school teachers (Group 4). According to their own reports, 27.8% of the participants were allergic themselves.

3.2 Future Teachers' Attitudes towards Managing the Allergic Reaction in Children in the School Environment

The future teachers demonstrated a positive attitude towards learning more about different child health issues. Average scores above 3.5 showed that the future teachers are typically interested or very interested in obtaining knowledge about the management of allergies and anaphylaxis in the school environment (Table 1).

Table 1. Average scores in future teachers' attitudes towards learning about allergy and anaphylaxis management (on five-point scale of agreement with the specific item).

Attitude items	<i>M</i>	<i>SD</i>
I am interested in health topics, so I would like to learn more during my studies.	4.10	.774
During a severe allergic reaction, a child can die, so this medical content is very important to all kindergarten/school teachers.	4.71	.553
As a kindergarten/school teacher, I am responsible for the health of the children in my class.	4.18	.818
No courses were provided at university to acquire health competences on topics that are important for the kindergarten/school teacher.	3.68	1.01
I would like to have an opportunity to acquire health competences during my study at university.	4.36	.654

More detailed analysis showed that 85% of the future teachers were interested or very interested in learning more about health topics in general. Almost all of the future teachers (98.6%) were aware that competences in the management of allergic reactions are very important for school personnel if a child has a severe life-threatening allergic reaction, and 82.9% of them were aware that they would be responsible for the health of the children under their protection in the kindergarten and school environment. Some 65.6% of all the future teachers expressed their concern about not having an opportunity to learn about health competences during their studies. At the same time, 94.4% of the future teachers expressed a desire to have an opportunity to develop their own competences to manage at least life-threatening and common health issues that could occur while children are under their supervision as school or kindergarten personnel.

85% of the future teachers demonstrated a positive attitude towards learning more about different children's health issues and they scored significantly higher on MCAD ($M=60.3$; $SD=15.7$) than the 15% of future teachers with a lower level of interest ($M=54.4$; $SD=17.5$) ($t=-3.15$; $df=570$; $p=.002$).

Only 6 of the 570 participants have expressed the opinion that such topics are unimportant. The average scores of these 6 future teachers on MCAD ($M=58.3$; $SD=14.7$) were lower than those of the future teachers who believe the opposite ($M=59.4$; $SD=16.1$).

Only 17.1% of the future teachers were not aware of their responsibility for children's health in the classroom. The average scores on MCAD were 3.4% lower for the "not aware" group ($M=56.6$; $SD=17.7$) than for the "aware" group ($M=60.0$; $SD=15.7$), but the difference was not statistically significant ($t=-1.887$; $df=570$; $p=.060$).

The difference in the average scores on MCAD between future teachers who reported that they had not received any information about health issues during their future teacher education and those who reported that some topics had been presented to them was not significant. Similar results were obtained comparing those future teachers who do not recognise the importance of additional education on managing children's allergic reactions and those who believe that this aspect of the future teacher education programme is important.

3.3 Future Teachers' Knowledge of the Management of Allergic Reaction in Children (MCAD)

There was an average understanding of managing allergic reaction in children ($M=59.4\%$; $SD=16.1\%$ success), with no statistically significant difference regarding the duration of undergraduate education, science background or the future teachers' self-allergy reports (Figure 1).

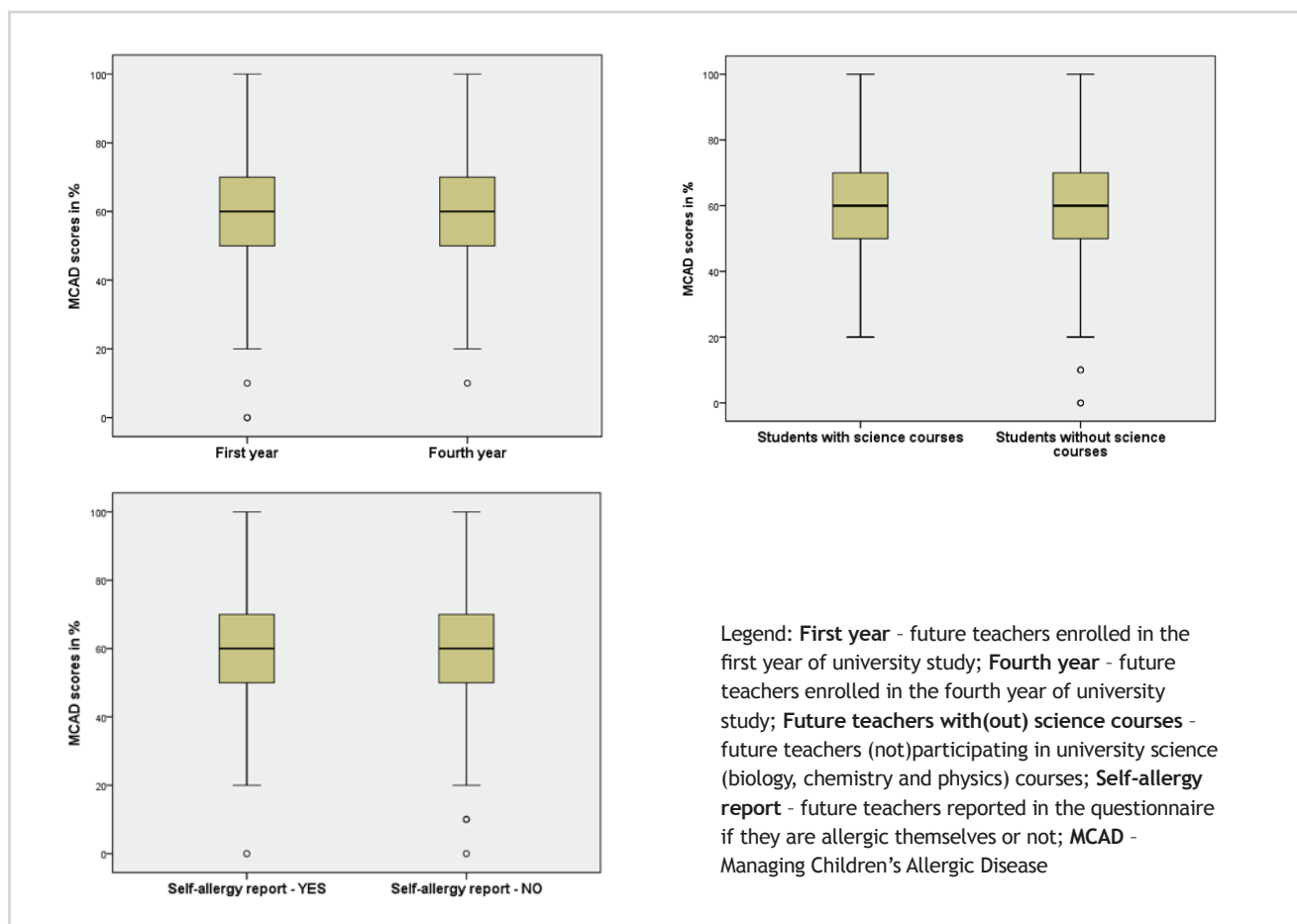


Figure 1. The differences in MCAD scores between the different groups of future teachers.

Female future teachers ($M=59.9$; $SD=15.8$) showed a statistically significantly higher level of knowledge of the management of children's allergic reactions than males ($M=53.0$; $SD=18.3$) ($t=-2.645$; $df=568$; $p=.008$).

There was a statistically significant difference in achievement scores for the four groups (see 3.1 Results section) of future teachers ($F(3,568) = 6.4$, $p \leq .000$). Post-hoc comparisons using the Tukey HSD test indicated that the mean score for Group 3 ($M=55.6$, $SD=16.4$) was significantly different from that of Group 2 ($M=63.3$, $SD=15.5$) and Group 4 ($M=60.2$, $SD=15.6$). Other differences between groups were not statistically significant.

The subsample of future teachers (Figure 2) who had taken a basic two-hour educational programme on managing children's allergies 26 months prior to this study scored significantly higher on MCAD ($Md=80.0$; $IQR: 70.0-87.5$) than those who had not ($Md=60.0$; $IQR: 50.0-70.0$; $Mann-Whitney U=83.0$; $p=.008$).

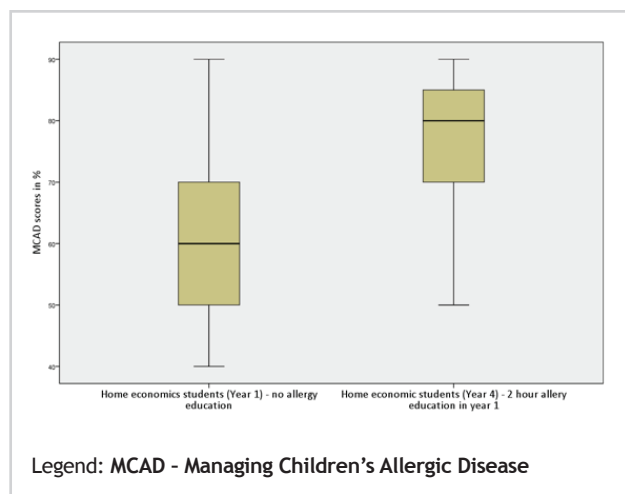


Figure 2. The differences in MCAD scores between 1st year home economics future teachers (no specific education about allergies in children) and 4th year home economics future teachers (with two-hour allergy education that was carried on in the first year of their study).

3.4 Future Teachers' Self-Perceived Competences for Managing Allergic Children in the School Environment

The results of the future teachers' self-perceived competences revealed that 43.5% of the future teachers had already heard of AAI and 47.6% of them would use it if necessary. This does not, however, mean that they know how to apply AAI to children with an anaphylactic reaction in the school environment, as only about 3.3% felt competent to help a child with an allergic reaction. It seems that future teachers are aware of the importance of their ability to help children in pre-school or school environment and that they would try to apply AAI somehow if necessary, but they do not feel generally competent in helping children with severe allergic reactions.

4 DISCUSSION

The main research problem of this study was to underline how future teachers understand the management of allergic reactions of children in school, and which variables influence their knowledge about allergic reactions and allergy management in school environment. As expected, future teachers' understanding of managing children's allergic reactions was average, as education on allergic reactions is currently only routinely available to a small group of future home economics teachers at the Faculty of Education in Ljubljana. The low level of future teachers' knowledge seemed comparable to (17), or even lower than, the level determined in certain previous studies involving in-service teachers (9, 11, 21). Female future teachers did, however, have a better knowledge

of managing children's allergic reactions than male future teachers, a result that is in line with other studies (25, 26), showing that female future teachers are more intrinsically motivated to learn biology than male future teachers, and that they demonstrate higher achievements in terms of knowledge. However, allergies can be a context that can stimulate future teachers' learning about health issues, like other medical topics (27) proved to motivate future teachers to deepen their knowledge. The highest scores regarding the management of children's allergies and anaphylaxis was in fact identified in the subject teachers group, which included future teachers with more scientific background, while the lowest average knowledge levels were observed in the group of social pedagogy, special education and art teachers, future teachers, who do not take science courses at university. Contrary to expectations, self-reported allergy did not raise the knowledge scores.

The subsample of future home economics teachers had taken an educational programme provided by one of the authors of this paper (a paediatrician with a special interest in allergology from a general hospital) in their first year of first cycle study. The programme was a 90-minute lecture with practical learning on how to use AAI similar in content as the educational programme presented in detail further on in the discussion section of this paper. It was a part of the Physiology of Nutrition course. 26 months later, (this study) future home economics teachers scored significantly higher on MCAD than those who had not taken the programme. This allergy management programme has had a positive long-term effect on the participants' knowledge of allergy and anaphylaxis management. These results are more promising than results reported in previous research involving in-service teachers or parents, which indicated that knowledge diminished gradually at six-month and one-year follow-up (16). Our findings provide additional evidence that teaching future teachers about allergic reactions in children is worthwhile. It is important to be aware that these future teachers study biology or chemistry along with home economics (the programme comprises topics/courses regarding nutrition), and that it can be assumed that they are more interested in health topics.

The future teachers showed positive attitudes towards learning more about different child health issues and most of the future teachers (85%) would like to develop health competences during their future education. This positive attitude of young, enthusiastic future teachers is undoubtedly a valuable attribute enabling them to develop health competences, as already formed in-service teachers are overwhelmed with their teaching activities in schools and may not be so willing to acquire additional knowledge and competences. It is important to emphasise that educational programmes on allergology issues should

be implemented already at the university level, in order to develop future teachers' awareness that knowledge of different health issues is very important for a competent in-service teacher.

The use of AAI is crucial in cases of anaphylaxis, wherever it occurs. Nevertheless, only 43.8% of the future teachers surveyed were willing to administer AAI to a child, with their most frequent concerns being hurting a child with a needle (55.7%), adrenaline side effects (36.9%) and legal consequences (27.5%). The fact that only about 3% of future teachers feel competent to help a child with an allergic reaction should be a huge indicator to implement adequate educational programmes about these topics into the undergraduate teachers' and teachers' education. These programmes were developed and implemented in the academic year 2015/16 for the first time. Future teachers were exposed to a 90-minute theoretical lecture supported by PowerPoint presentation about allergy, most common allergens, and basic principles of preventing and managing allergic reactions and anaphylaxis in school. Different case reports of allergic reactions in children and appropriate interventions that teachers could perform to minimise the unwanted consequences were presented. A workshop on how to use adrenalin auto-injector was carried out after the theoretical presentation. Future teachers were divided into groups of eight and each participant tried to apply AAI simulator to their peers, following the instructions given by the instructor. This education is provided by one of the authors of this paper from the University Children's Hospital in Ljubljana.

Practical topics, such as the side effects of adrenaline and its intramuscular application, should therefore be specifically addressed, as such issues might represent important obstacles to caregivers for administering adrenaline to a child in need. Furthermore, as already recommended by the EAACI (2), a broader coordinated national and EU strategy, including such areas as defining legal aspects - as pointed out by our participants, as well - should be developed. The introduction of a well-defined law on the management of anaphylaxis is an important and necessary step, as demonstrated elsewhere (28).

It is important to emphasise that developing efficient effective educational programme for teachers regarding anaphylaxis, which could be repeated also by other tutors and therefore broadly disseminated across Slovenia, should also be important from the viewpoint of public health. This is especially important because wider availability of adrenaline auto injectors in primary schools has been recently authorised by paediatricians and the National institute of Public Health in Slovenia. Therefore, adequate development of future teachers' and teachers' competences for managing children's severe allergic reactions is needed (29).

There are some limitations of this research. A small sample size of the specific group of home economics future teachers can influence the significance of the results, and they are shown as an illustration of possible positive long-term outcomes of specific medical educational programmes for teachers. It is also important to emphasise that the differences in gender can influence the management of allergic reactions in school children, and since a small group of male future teachers was available in this study, these results are informative. Both groups of participants were available only in small groups, but because the issue is important, the data were analysed, and results presented. However, further study, using bigger samples, should be conducted to confirm these results. It is also important to emphasise that for the purposes of the research problem presented in this paper, only univariate statistics were used. Multivariate analysis should be used for deeper understanding of the possible interdependences of the researched variables. Further research into teachers' health competences in managing allergic reactions in children in the school environment should concentrate on: (1) determining effective educational approaches to be implemented in future teacher and teacher training, (2) how to stimulate future teachers to develop these competences, (3) determining what influences the development of future teachers' health competences, (4) how to efficiently identify the attitudes and knowledge of kindergarten and school personnel (especially providers of non-prepared foods) regarding the management of allergic reactions in children, and (5) exploring future teachers' awareness of the impact of child's allergic reactions on his/her and teachers' quality of life.

5 CONCLUSION

It can be concluded that all future teachers should develop adequate competences to manage allergic reactions in children before they finish their university studies. The duration of undergraduate education, natural sciences background and self-allergy did not influence the level of knowledge regarding the management of allergic children. Future teachers showed an average level of knowledge about allergic child management, but they expressed a high level of positive attitude and a need to be educated about these topics. There is some evidence already that a basic educational programme in allergy management had a positive effect on future teachers' knowledge of allergic reactions management in children. However, there is a need for efficient educational programmes capable of developing adequate health competences, since kindergarten and school personnel are expected to be able to provide first aid in the kindergarten/school environment, as already suggested also by some studies (30) in the Slovenian context.

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CONFLICTS OF INTEREST

All authors declare that no conflicts of interest exist.

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ETHICAL APPROVAL

This type of research did not require an ethical approval, but it complies with Slovenian ethical regulations on pedagogical research involving potentially sensitive personal data. Participants were not being forced to participate in this research or to fill in questionnaires.

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HOSPITAL STAFF'S RISK OF DEVELOPING MUSCULOSKELETAL DISORDERS, ESPECIALLY LOW BACK PAIN

TVEGANJE DELAVCEV, ZAPOSLENIH V BOLNIŠNICI, ZA NASTANEK BOLEZNI KOSTNO-MIŠIČNEGA SISTEMA IN VEZIVNEGA TKIVA, ZLASTI ZA NASTANEK BOLEČINE V KRIŽU

Nataša DERNOVŠČEK HAFNER^{1*}, Damjana MIKLIČ MILEK¹, Metoda DODIČ FIKFAK¹

¹University Medical Centre Ljubljana, Clinical Institute of Occupational, Traffic and Sports Medicine, Poljanski nasip 58, 1525 Ljubljana, Slovenia

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ABSTRACT

Keywords:

health-related absenteeism, musculoskeletal disorders, low back pain, healthcare employees, workplace health promotion

Introduction: Health-related absenteeism impacts individuals, companies, and society. Its consequences are reflected in the cost of benefits, substitutes, and reduced productivity. Research shows that musculoskeletal disorders (MSDs) are the most common work-related health problem reported by hospital staff. This study determines the groups at the Ljubljana University Medical Centre that are most susceptible to MSDs, especially low back pain.

Methods: Using data from the Health Data Centre of the Slovenian National Public Health Institute and the medical centre, this cross-sectional study analysed absenteeism among medical centre employees. The correlation between MSD / low-back pain risk factors and incidence was determined using logistic regression. An odds ratio was calculated to determine the probability of MSDs, most especially low back pain via sex, age, occupation, and education.

Results: Sick leave at the medical centre is higher than 5%, exceeding the Slovenian healthcare sector average. MSDs, as the main reason for absence, is significantly more frequent in women, non-medical staff, and employees with a maximum secondary school education. Among the MSDs, low back pain predominates as a reason for absence and is most frequent among nurses, midwives, and employees of 20 to 44.9 years old.

Conclusion: This study offers insight into the health status of medical centre employees. The high percentage of sick leave is mainly due to musculoskeletal disorders, including low back pain. This is an important basis for further monitoring and analysis of sick leave indicators and for planning systematic and continuous workplace health-promoting measures to manage ergonomic risk factors and reduce health-related absenteeism.

IZVLEČEK

Ključne besede:

zdravstveni absentizem, boleznimi mišično-kostnega sistema in vezivnega tkiva, bolečina v križu, zdravstveni delavci, promocija zdravja pri delu

Uvod: Zdravstveni absentizem ima pomemben vpliv na posameznika, podjetje in družbo. Posledice tega se lahko na ravni podjetja kažejo predvsem v stroških nadomestil zdravljenja, nadomeščanja kadrov in v zmanjšani produktivnosti. Najvišji delež zdravstvenega absentizma je posledica bolezni mišično-kostnega sistema in vezivnega tkiva (KMB). Te bolezni so najpogostejše pri zdravstvenih delavcih. V dosedanjih raziskavah še posebej izstopa bolečina v križu pri delavcih v zdravstveni in babiški negi, medtem ko je tveganje za nastanek bolečine v križu glede na starost delavca nekonsistentno. Cilj študije je bil na podlagi podatkov bolniškega staleža narediti poglobljeno analizo zdravstvenega stanja delavcev v zdravstveni ustanovi, na podlagi katere bi lahko oblikovali, izvedli in spremljali rezultate programov promocije zdravja na delovnem mestu. Želeli smo tudi ugotoviti, katere poklicne skupine v zdravstvenem zavodu so najbolj ogrožene zaradi KMB, posebej zaradi bolečine v križu, katere starostna skupina zdravstvenih delavcev je najbolj ogrožena ter kako na bolečino v križu vpliva socialni status.

Metode: V presečni študiji smo analizirali bolniško odsotnost delavcev UKC Ljubljana. Razlike v pogostosti pojavnosti KMB, posebej bolečine v križu kot najpogostejše diagnoze, med različnimi skupinami zaposlenih smo ugotavljali s testom hi-kvadrat. Povezanost med dejavniki tveganja in pojavnostjo KMB/bolečine v križu smo ugotavljali z logistično regresijo. Verjetnost za pojavnost KMB in bolečine v križu pri delavcih glede na spol, starost, poklicno skupino in doseženo izobrazbo smo ugotavljali z razmerjem obetov (RO).

Rezultati: Analiza bolniške odsotnosti kaže, da je odstotek bolniške odsotnosti v organizaciji večji od 5. Glavni vzrok zadržanosti z dela so KMB, ki se značilneje pogosteje pojavljajo pri ženskah, v poklicni skupini nezdravstvenih delavcev ter pri delavcih z doseženo največ V. stopnjo izobrazbe. Med KMB kot vzrok za bolniško odsotnost prevladujejo bolečine v križu. Te se značilneje pogosteje pojavljajo v poklicni skupini zdravstvene in babiške nege ter pri delavcih v starostni skupini od 20 do 44,9 leta.

Zaključek: Glavni vzrok zadržanosti od dela v UKC Ljubljana so KMB, ki se najpogosteje pojavljajo pri nezdravstvenih delavcih, medtem ko je bolečina v križu najpogostejši vzrok za bolniško odsotnost delavcev v zdravstveni in babiški negi. Posebej je zaradi bolečine v križu ogrožena skupina mlajših delavcev. Ugotovitve raziskave so pomembno izhodišče za načrtovanje ukrepov promocije zdravja pri delu za obvladovanje ergonomskih dejavnikov tveganja s ciljem zmanjšanja zdravstvenega absentizma in boljšega počutja delavcev.

*Corresponding author: Tel. + 386 1 522 26 95; E-mail: natasa.dernovscekhafner@kclj.si

1 INTRODUCTION

Health-related absenteeism is a socioeconomic phenomenon that has an important effect on individuals, companies, and society in general. Factors influencing health-related absenteeism are diverse and are not linked exclusively to employee health status; they can be economic, psychological, social, and cultural (1, 2). At the individual level, the following negative effects of absence due to illness are mentioned most frequently: low personal income, limited opportunities for promotion and career development, and limited opportunities for changing jobs; in addition, absence due to illness significantly reduces work motivation and indirectly increases the chances of becoming unemployed (2-4). At the company level, the consequences of health-related absenteeism primarily show in the costs of treatment benefits and staff substitution, and in reduced productivity, which in turn can have a negative impact on the economy in general (2).

Work-related diseases are reported by 40 to 60% of the working-age population in the majority of EU countries (5). As a rule, absence due to illness is more frequent and longer among women, older employees, those exposed to more strenuous physical work, and those with low socioeconomic status (5, 6). According to an Irish study, the causes of long-term absence primarily include injuries, poor mental health, and back pain (7). In EU countries, musculoskeletal diseases (MSDs) have the highest prevalence among work-related diseases (8). A diagnosed MSD often leads to early retirement and is the prevailing risk factor for occupational disability, especially among women (9).

MSDs are also the main reason for health-related absenteeism among Slovenian employees (2, 10). In 2015, absence among the employees due to MSDs in Slovenia accounted for 2,320,498 calendar days lost. A single absence due to MSDs lasted 29 days on average and 2.82 calendar days were lost per employee due to this disease group (10).

The majority of studies exploring health-related absenteeism among health professionals focus on nurses, who usually represent the largest group of employees (11-14). Research findings also show that MSDs are the most frequent work-related health problem among hospital staff, especially nurses (11-14). In addition, MSDs and especially low back pain result in substantial financial costs, in which half of the costs related to absence from work and disability due to MSD can be ascribed to low back pain (13, 16, 17).

Based on the currently available literature, studies of MSDs and especially low back pain in healthcare occupational groups other than nurses and midwives are extremely rare (18-20). Moreover, data on the risk of low back pain by age group are not consistent (13, 17).

The aim of this study is to analyse in detail the health status of staff at the healthcare institute observed using sick-leave data in order to provide a basis for developing and implementing workplace health-promotion programs and monitoring their results. This study also examines the occupational groups at the healthcare institute observed that are most susceptible to MSDs and especially low back pain, and the age group that is at the greatest risk in this regard.

2 METHODS

This cross-sectional study analysed health-related absenteeism among Ljubljana University Medical Centre employees from January 1st to December 31st, 2014 and from January 1st to December 31st, 2015.

Anonymised and aggregated data on employee numbers and structure (sex, age, education, and occupation) were obtained from the Ljubljana University Medical Centre personnel records. Data for analysing health-related absenteeism for both years were obtained from the Health Data Portal of the Slovenian National Public Health Institute (hereinafter: the NPHI). The data on absenteeism were processed and presented using a social-medical method, which typically uses calendar days and closed cases per diagnosis during a period observed in order to calculate and present sick leave indices, such as the percentage of sick leave (% SL), the frequency index (FI), and severity (S).¹ Differences in the frequency of MSDs, especially low back pain, as the most frequent diagnosis, between various employee groups, were established using a chi-squared test. The correlation between MSD / low-back pain risk factors and incidence was determined using logistic regression. An odds ratio (OR) was calculated to determine the probability of MSD and low back pain occurrence in employees by sex, age, occupation, and education. A statistically significant difference was defined at $p < 0.05$. IBM SPSS Statistics 20.0.0 software was used for data processing.

¹The percentage of sick leave (% SL) refers to the percentage of calendar days lost per employee in 1 year. The frequency index (FI) refers to the number of sick leave cases per 100 employees, irrespective of the duration of individual sick leave. Severity (S) refers to the average number of calendar days lost per sick leave and reveals the average duration of a sick leave expressed in days.

3 RESULTS

3.1 Analysis of Employee Health at the Ljubljana University Medical Centre

On December 31st, 2014 and December 31st, 2015, the Ljubljana University Medical Centre had 7,778 and 7,884 employees respectively, or 6,168 (79.3%) / 6,246 (79.2%) women and 1,610 (20.7%) / 1,638 (20.8%) men (21, 22; Table 1).

Table 1. Occupational, age, and educational structure of Ljubljana University Medical Centre employees in 2014 and 2015.

	n (%)	
	2014	2015
Occupational structure		
Physicians and dentists	1,177 (15%)	1,212 (15%)
Nurses and midwives	3,791 (49%)	3,857 (49%)
Other health professionals	883 (11%)	884 (11%)
Non-health professionals	1,901 (24%)	1,910 (24%)
Other employees from other pay grades	26 (< 1%)	21 (< 1%)
Age structure		
<44.9 years	4,866 (63%)	4,896 (62%)
>45 years	2,912 (37%)	2,988 (38%)
Educational structure		
Up to and including secondary school degree	4,040 (52%)	3,974 (50%)
College or university degree	2,905 (37%)	3,055 (39%)
Specialisation, master's degree, PhD	833 (11%)	855 (11%)

The analysis of sick-leave indices at the Ljubljana University Medical Centre shows that in both 2014 and 2015, the percentage of sick leave was higher than 5 (2014: 5.52%; 2015: 6.10%) and exceeded that of the Slovenian healthcare sector in general (2014: 5.30%; 2015: 5.77%). The frequency index shows that every employee out of 100 was absent due to illness 1.4 times in 2014 and 1.8 times in 2015. The severity index, which shows the average duration of sick leave, was 1.6 days less compared to 2014 (Table 2).

Table 2. Comparison of sick-leave indices (% SL, FI, and S) at the Ljubljana University Medical Centre for 2014 and 2015.

	% SL	FI	S
2014	5.52	146.70	13.70
2015	6.10	184.43	12.07

% SL=percentage of sick leave, FI=frequency index, S=severity of disease in days

MSDs (%SL₂₀₁₄=1.01%; %SL₂₀₁₅=1.04%) are the main reason for the higher percentage of sick leave. Taking care of a family member is the most frequent reason for taking sick leave (FI₂₀₁₄=42.00; FI₂₀₁₅=52.49), and injuries and poisoning at work are the main reasons for the longest absence from work (S₂₀₁₄=65.47, S₂₀₁₅=68.57).

The percentage of sick leave differs by sex. MSDs account for the highest percentage of sick leave in women, whereas in men, the main reasons are non-work-related injuries and poisoning (Table 3).

Table 3. Percentage of sick leave (%SL) at the Ljubljana University Medical Centre by first five diagnoses in 2014 and 2015.

Condition	% SL			
	Women		Men	
	2014	2015	2014	2015
MSDs	1.15	1.18	0.35	0.43
Pregnancy, birth, and postnatal period	0.67	0.75	-	-
Taking care of a family member	0.67	0.72	-	-
Respiratory diseases	0.57	0.72	0.37	0.45
Non-work-related injuries and poisoning	-	-	0.48	0.43

% SL= percentage of sick leave

There were significant differences in the frequency of MSD incidence between men and women in 2014 ($\chi^2=40.55$, $p<0.0001$) and 2015 ($\chi^2=49.81$, $p<0.0001$). MSDs occurred more frequently in women than in men in both 2014 (OR=1.93; 95% CI=1.57-2.37, $p<0.0001$) and 2015 (OR=1.98; 95% CI=1.63-2.40, $p<0.0001$).

MSDs occurred more frequently in employees above 45 years of age. A comparison of the frequency of occurrence of various MSD diagnoses at the Ljubljana University Medical Centre shows that, compared to other diagnoses, low back pain (dorsalgia, diagnosis code M54) was the most common and occurred in half of all cases reported (51% in 2014 and 55% in 2015). The odds of developing low back pain among employees ranging between 20 to 44.9 years old were twice as high among employees ranging from 45 to 65 years old (Table 4).

Table 4. Odds ratio for MSDs and low back pain by age group at the Ljubljana Medical Centre, 2014-2015.

Age group	Period	OR	(95% CI)	χ^2	<i>p</i>
MSD					
45-65 years vs.	2014	2.46	2.13-2.83	163.21	<0.0001
20-44.9 years	2015	2.66	2.32-3.01	216.83	<0.0001
Low back pain					
20-44.9 years vs.	2014	1.83	1.40-2.39	19.77	<0.0001
45-65 years	2015	2.05	1.52-2.65	30.68	<0.0001

A comparison by an occupational group shows that non-health professionals² had higher odds of developing MSDs in 2014 (OR=1.89; 95% CI=1.63-2.20, $p<0.0001$) and 2015 (OR=2.28; 95% CI=1.99-2.62, $p<0.0001$) than health professionals. However, the results show that health professionals had higher odds of developing low back pain than non-health professionals in 2015 (OR=1.35; 95% CI=1.05-1.73, $p=0.02$; Table 5).

Another interesting finding is that, compared to all other occupational groups, nurses and midwives did not show a higher risk of developing MSDs in 2014 (OR=1.06; 95% CI=0.92-1.22, $p=0.38$). The same was also true in 2015 (OR=0.97; 95% CI=0.85-1.11, $p=0.66$), which cannot be said for low back pain: in 2015, the odds of nurses and midwives developing low back pain were nearly 1.5 times higher than that of other occupational groups (OR=1.41; 95% CI=1.10-1.80, $p<0.006$).

² Non-health professionals (mostly in public employee pay grade J) account for 25% of all employees at this healthcare institution and consist of various occupations: cooks, cleaning and maintenance staff, janitors, heating plant workers, electricians, plumbers, laundry staff, (administrative) secretaries, bookkeepers, accountants, IT specialists, materials managers, warehouse staff, and so on.

Table 5. Odds ratio for the occurrence of MSDs and especially low back pain in various occupational groups at the Ljubljana Medical Centre, 2014-2015.

	Period	OR	(95% CI)	χ^2	<i>p</i>
MSD occurrence					
Non-health professionals vs. health professionals	2014	1.89	1.63-2.20	72.26	<0.0001
	2015	2.28	1.99-2.62	174.71	<0.0001
Nurses and midwives vs. other employees	2014	1.06	0.92-1.22	0.76	0.38
	2015	0.97	0.85-1.11	0.19	0.66
Low back pain occurrence					
Health professionals vs. non-health professionals	2014	1.01	0.77-1.32	0.01	0.92
	2015	1.35	1.05-1.73	5.34	0.02
Nurses and midwives vs. other employees	2014	0.97	0.75-1.26	0.04	0.84
	2015	1.41	1.10-1.80	7.44	0.006

Social status certainly also affects the development of MSDs. Social status established based on educational level shows that in 2014, employees with a maximum secondary-school education had 2.4 times higher odds of developing MSDs compared to higher-educated employees (OR=2.41; 95% CI=2.07-2.80, $p<0.0001$). The same results were also obtained in 2015 (OR=2.49; 95% CI=2.16-2.86, $p<0.0001$).

Compared to higher-educated employees, those with a maximum secondary-school education were not at greater risk of developing low back pain.

4 DISCUSSION

The predominant diagnoses causing absence from work among employees at the Ljubljana University Medical Centre primarily include MSDs, which are also the main reason for health-related absenteeism among all employees in Slovenia (2, 10), in Europe (8, 16, 23), and globally (24).

Among MSDs, low back pain is the most frequent (13, 16, 17, 25-27). The occurrence of MSDs and especially low back pain has been well researched for health professionals, especially nurses (13, 17, 23, 28). Based on the available literature, exceptionally little research has been done on MSDs and especially low back pain among other health professions (18, 19, 20). Some older studies conducted at hospitals reported a high prevalence of MSDs and especially low back pain among non-health professionals, especially administrative and technical staff, who ascribed it to largely sedentary work and lifting or carrying heavy items (18, 19, 20).

Similar findings were also established in this study: the highest odds of developing MSDs were estimated for non-health professionals, who make up a very heterogeneous group at the medical centre. Their work is mostly associated with risk factors for developing MSDs, such as poor ergonomic posture, lifting, pushing, or carrying

heavy items, repeated movement, and static muscular activity (6, 23).

The findings of this study show that, compared to higher-educated employees, those with a maximum secondary-school education, who presumably have a low socioeconomic status, have higher odds of developing MSDs. Similar findings have also been established by other studies (5, 6). Namely, socioeconomic status (SES) has long been considered an exacerbating risk factor for developing MSDs that should not be ignored. In addition, SES also influences employees' capacity to deal with their health problems; employees with a lower level of education show a lower capacity in this regard (27).

This study also shows that health professionals and especially nurses and midwives have the highest odds of developing low back pain. The majority ascribe this to physical strain at work, such as providing care to moving and transporting patients, and lifting heavy loads (13, 15, 23). A Slovenian survey on health-related absenteeism also established that female health and social care employees are the most susceptible to low back pain (27).

In contrast to a 2016 survey conducted at Slovenian hospitals, which showed that it is primarily elderly employees that suffer from low back pain (17), this study reveals a higher risk of developing low back pain among younger employees: the odds of developing low back pain were twice as high among employees of 20 to 44.9 years old than among those of 45 to 64.9 years old. Similar findings were also obtained by Demšar et al. (13). Studies conducted on the general population also report the highest incidence of low back pain in the third decade of life (29). These results can at least be partly ascribed to the healthy worker effect (HWE) - a phenomenon in which employees experiencing low back pain already change jobs or retire as disabled when they are young, and so less absenteeism of this type may be observed at an older stage in life.

One of the weaknesses of this study may be the fact that it was carried out on the health staff of only one healthcare institution in Slovenia. However, it should be noted that this is an extremely large organisation with nearly 8,000 employees and therefore, it is highly likely that the findings obtained can be generalised to all health professionals employed at Slovenian hospitals. In addition, the impersonal approach, whereby the estimates were made based on anonymised and aggregated data, did not allow more complex analyses and additional inquiries about the possible causes of MSDs and especially low back pain.

A clear advantage of this study is that it includes non-health professionals employed at a hospital, who are clearly at risk in this regard. Namely, the majority of published research on MSDs in hospital staff largely describes health professionals, whereas non-health professionals have remained overlooked.

Therefore, in the future, it would make sense not only to monitor sick leave indices for all employees at the healthcare institution but also to conduct an analytical study that would also reveal as many important risk factors as possible for developing MSDs and especially low back pain among non-health professionals.

5 CONCLUSION

MSDs are the main reason for the high percentage of sick leave among Ljubljana University Medical Centre employees. They pose the greatest risk for non-health professionals, who make up an extremely heterogeneous and often overlooked group. The highest odds of developing low back pain were established for health professionals, especially nurses and midwives. The introduction of ergonomic measures in the workplace can prevent or alleviate many of these diseases. The authors of this study expect their findings to help health organisations plan systematic and ongoing workplace health promotion measures to manage the ergonomic risk factors. These measures should include setting up an ergonomic work environment (checking whether the workplace has ergonomic furniture, replacing non-ergonomic furniture with ergonomic furniture, and offering guided active breaks) and providing employee training, especially to vulnerable groups with a lower education level and a low SES, in order to reduce health-related absenteeism and improve employee wellbeing.

CONFLICTS OF INTEREST

The authors declare that no conflicts of interest exist.

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ETHICS COMMITTEE APPROVAL

The data analysed in this study were obtained from the national database maintained by the National Institute of Public Health and the database maintained by the Ljubljana University Medical Centre. The data were analysed without information about the identity of individuals. The study was conducted in accordance with the Code of Ethics of the World Medical Association (Declaration of Helsinki). All of the analyses were performed on aggregated data and did not include personal information.

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ANTICHOLINERGIC BURDEN AND MOST COMMON ANTICHOLINERGIC-ACTING MEDICINES IN OLDER GENERAL PRACTICE PATIENTS

ANTIHOLOGIČNO BREME IN NAJPOGOSTEJŠA ANTIHOLOGIČNA ZDRAVILA PRI STAREJŠIH OBISKOVALCIH AMBULANTE DRUŽINSKE MEDICINE

Eva GORUP^{1*}, Janez RIFEL¹, Marija PETEK ŠTER¹

¹University of Ljubljana, Faculty of Medicine, Department of Family Medicine, Poljanski nasip 58, 1000 Ljubljana, Slovenia

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ABSTRACT

Keywords:

anticholinergic burden, aged, general practice, inappropriate prescribing

Introduction: Anticholinergic burden in older adults has been correlated with cognitive decline, delirium, dizziness and confusion, falls and hospitalisations. Nevertheless, anticholinergic-acting medications remain commonly prescribed in up to a third of older adults in primary care population. Our aim was to study the anticholinergic burden in older adults in Slovenian ambulatory setting and explore the most commonly involved medications which could be avoided by the physicians.

Methods: A cross-sectional study was conducted in 30 general practices in Slovenia as part of a larger trial. Data on prescribed medications were collected for randomly chosen adults of over 65 years of age visiting general practice, who were taking at least one regularly prescribed medication. Anticholinergic burden was calculated using Duran's scale and Drug Burden Index.

Results: Altogether, 622 patients were included, 356 (57.2%) female, average age of 77.2 (± 6.2), with an average of 5.6 medications. At least one anticholinergic medication was present in 78 (12.5 %) patients. More than half (N=41, 52.6%) of anticholinergic prescriptions were psychotropic medications. Most common individual medications were diazepam (N=10, 1.6%), quetiapine (N=9, 1.4%) and ranitidine (N=8, 1.3%).

Conclusions: Though the prevalence of anticholinergic medications was low compared to international research, the most commonly registered anticholinergic prescriptions were medications that should be avoided according to guidelines of elderly prescriptions. It would be probably clinically feasible to further decrease the anticholinergic burden of older adults in Slovenian primary care setting by avoiding or replacing these medications with safer alternatives.

IZVLEČEK

Ključne besede:

antiholinergično breme, starostniki, ambulante družinske medicine, neprimerno predpisovanje zdravil

Uvod: Večje antiholinergično breme pri starejših odraslih je povezano s kognitivnim upadom, delirijem, zmedenostjo, padci in hospitalizacijami. Kljub temu ima predpisane antiholinergike skoraj tretjina starostnikov na primarnem nivoju. Želeli smo raziskati antiholinergično breme pri starostnikih v ambulantah družinske medicine v Sloveniji in najpogostejša zdravila z antiholinergičnim delovanjem, ki bi se jim zdravniki pri predpisovanju lahko izognili.

Metode: V presečni raziskavi smo v 30 ambulantah družinske medicine zbrali podatke o predpisanih zdravilih za naključno izbrane starostnike nad 65 let, ki so na dan raziskave zaradi kateregakoli razloga obiskali ambulanto in ki so kot redno terapijo jemali vsaj eno zdravilo. Antiholinergično breme smo izračunali s pomočjo Duranove lestvice in lestvice Drug Burden Index.

Rezultati: V raziskavo je bilo vključenih skupno 622 bolnikov, od tega 356 (57,2 %) žensk. Povprečna starost je bila 77,2 ($\pm 6,2$) leta, bolniki pa so jemali povprečno 5,6 zdravil. Vsaj eno antiholinergično zdravilo je jemalo 78 (12,5 %) bolnikov. Več kot polovica (N = 41, 52,6 %) vseh predpisanih zdravil z antiholinergičnimi učinki je bila psihotropnih. Med posameznimi zdravili so bili najpogosteje predpisani diazepam (N = 10, 1,6 %), kvetiapin (N = 9, 1,4 %) in ranitidin (N = 8, 1,3 %).

Zaključki: Prevalenca predpisovanja antiholinergičnih zdravil je bila nizka v primerjavi z mednarodnimi raziskavami, vendar pa so bila antiholinergična zdravila med najpogostejše predpisanimi zdravili, ki jih smernice o predpisovanju zdravil pri starostnikih odsvetujejo. Verjetno bi bilo mogoče še dodatno zmanjšati antiholinergično breme pri starostnikih na primarnem nivoju v Sloveniji s tem, da bi se tem zdravilom izognili ali jih zamenjali z varnejšimi alternativami.

*Corresponding author: Tel. + 386 40 744 286; E-mail: eva.gorup@gmail.com

1 INTRODUCTION

Many older adults suffer from multiple chronic diseases and are commonly prescribed with several medicines for multiple different conditions. This may lead to prescribing of multiple medicines with an anticholinergic burden, both when anticholinergics are prescribed for their anticholinergic effect, as well as for medicines which can cause anticholinergic side effects due to anticholinergic properties but are not strictly classified as anticholinergics (1).

Commonly reported peripheral side effects of anticholinergic medicines include dry mouth, dry eyes, constipation, urinary retention, blurred vision and increased heart rate, while central effects range from dizziness, sedation, confusion and delirium (1-3). Multiple studies reported the association between anticholinergic effect on cognitive function (1, 3-5), increased risk of delirium (3), dizziness and confusion (6), but also falls (1, 3, 6), hospitalisations (1, 7), and physical function (1, 5, 8), especially in vulnerable populations such as old (1) or patients with Parkinson disease (9).

Older adults are more at risk for anticholinergic side effects than young people because of increased permeability of the blood-brain barrier, decreased drug metabolism and elimination and age-related deficit in central cholinergic transmission (2). Several instruments have been developed and validated to determine the anticholinergic burden, among others are Anticholinergic Risk Scale (ARS) (6), Anticholinergic Drug Scale (ADS) (10), Anticholinergic Cognitive Burden Scale (ACB) (11) and Drug Burden Index (DBI) (12). However, there is a poor agreement between different anticholinergic scales in terms of medicines included and the results are, therefore, difficult to compare (13, 14). Several studies, using different instruments, found the prevalence of exposure to anticholinergic medicines between 9% to 55.9% (5, 14, 15). A comparison of scales in several studies showed that instruments differed in sensitivity and specificity because of their differences in identification criteria for anticholinergics. Despite this, most scores were associated with adverse clinical outcomes of interest (5, 14). The strongest predictor was DBI - Anticholinergic Component (ACH) Score (14).

Recently, Duran et al., used the existing anticholinergic risk scales to develop a list of anticholinergic medicines that occur in most scales and have confirmed anticholinergic properties as an attempt to standardise measurement of anticholinergic drug burden (16).

In most European countries, general practitioners prescribe the majority of medicines patients receive, and have a comprehensive overview of medical therapy of their patients, which contributes to a high-quality care, measured by process-quality indicators (17, 18).

However, there have been few studies about the quality of prescription in older adults, in general practice in Slovenia.

Our aim was to explore anticholinergic burden in older general practice patients in Slovenia and determine the most commonly used medicines and prescribing patterns contributing towards anticholinergic burden.

2 METHODS

2.1 Design and Setting

A cross-sectional study was conducted in 30 Slovenian general practices spread throughout the country. All statistical regions except Pomurje were represented. The study was a sub-part of the main trial that has been described elsewhere (19).

2.2 Study Population

Study population consisted of 622 older general practice patients. Participating physicians selected one working day in advance and recruited all eligible patients who visited their practice on that day. If they recruited less than 20 patients, they could select another day until they recruited 20 to 30 patients. The eligible patients who were over 65 years of age, were receiving at least one prescribed medicine in regular therapy and were cognitively able to answer questionnaires and give informed consent to the study. Patients with life expectancy of less than 1 year (in terminal stages of diseases) were excluded. One of the patient withdrew consent after initially participating in the study and was not included in the analysis.

2.3 Data Collection

Patients, who fulfilled inclusion criteria and signed informed consent, filled out a questionnaire on demographic and other health data. For the purposes of the main trial, a computer application was developed into which participating physicians entered enrolled patients' medicines.

As a basis for measuring anticholinergic burden, we used the list of anticholinergic medicines created by Duran et al., which is a uniform list of anticholinergic medicines for which either agreement on anticholinergic properties exists, or a reputed reference source confirms the anticholinergic properties. The list consists of 100 medicines which are further divided into low-potency anticholinergics and high-potency anticholinergics and assigned score 1 (low-potency) or 2 (high potency). Duran's scale was developed from seven previously-used instruments as an attempt to standardise the list of anticholinergic medicines, in response to poor agreement between different published scales (16). Further, we calculated DBI-ACH score based on medicines contained

in Duran's scale. DBI-ACH measures the exposure to anticholinergic medicines and considers the daily dosage of medicine (12).

The application checked entered medicines against medicines on Duran's list of anticholinergic scale and calculated the burden score for every patient by adding together the assigned scores for each medicine from the list. Patients with a score of at least 2 were considered to have a high anticholinergic burden.

Basic patient data was described by standard descriptive methods. All data were entered into Microsoft Excel 2007 and transferred and analysed with IBM SPSS Version 24.0 (SPSS Inc., Chicago, IL, USA).

3 RESULTS

Data was collected for 622 patients from 30 different general practices from all regions in Slovenia, while 15 patients (2.4%) refused to participate in the study. Characteristics of the population are presented in Table 1.

Table 1. Descriptive statistics.

Characteristic	
Gender N (%)	
• Male	266 (42.8%)
• Female	356 (57.2%)
Average age in years (\pmSD)	
• Range (years)	65-101
Number of prescribed medicines N (\pmSD)	5.6 (\pm 2.9)
Presence of polypharmacy (5 or more medicines)	374 (60.1%)

At least one medicine with anticholinergic properties was present in 78 patients (12.5%). Anticholinergic burden by score is presented in Table 2.

Table 2. Anticholinergic burden in patients with anticholinergic medicines (N=78).

Anticholinergic burden (score)	N (%) of patients with anticholinergic medicines
1	54 (69.2%)
2	19 (24.4%)
3	4 (5.1%)
4	1 (1.3%)

DBI was calculated for all patients receiving anticholinergic medicines. 10 patients had $DBI \geq 1$, while the rest had DBI between 0.11 and 0.94. Patients with $DBI < 1$ had an anticholinergic burden score of 1 or 2, while patients with $DBI \geq 1$ had an anticholinergic burden score between 2 to 4. The highest DBI score was 1.83, in the patient with anticholinergic burden score of 4.

Of the 100 medicines on the list, only 24 medicines occurred in our population. They are shown in Table 3.

Table 3. List of anticholinergic medicines in patients with an anticholinergic burden.

Medicine (ATC code)	N (%) of patients with anticholinergic burden N=78	% of all enrolled patients N=622	Anticholinergic burden
Psychotropic medicines (N)	41 (52.6%)	6.6%	
Diazepam (N05BA01)	10 (12.8%)	1.6%	1
Quetiapine (N05AH04)	9 (11.5%)	1.4%	1
Paroxetine (N06AB05)	7 (9.0%)	1.1%	1
Amitriptylyne (N06AA09)	6 (7.7%)	1.0%	2
Mirtazapine (N06AX11)	4 (5.1%)	0.6%	1
Citalopram (N06AB04)	4 (5.1%)	0.6%	1
Fentanyl (N02AB03)	2 (2.6%)	0.3%	1
Olanzapine (N05AH03)	2 (2.6%)	0.3%	1
Carbamazepine (N03AF01)	2 (2.6%)	0.3%	1
Fluoxetine (N06AB03)	2 (2.6%)	0.3%	1
Risperidone (N05AX08)	2 (2.6%)	0.3%	1
Promazine (N05AA03)	1 (1.3%)	0.2%	1
Clozapine (N05AH02)	1 (1.3%)	0.2%	2
Lithim (N05AN01)	1 (1.3%)	0.2%	1
Trazodone (N06AX05)	1 (1.3%)	0.2%	1
Alimentary tract and metabolism medicines (A)	11 (14.1%)	1.8%	
Ranitidine (A02BA02)	8 (10.3%)	1.3%	1
Domperidone (A03FA03)	3 (3.8%)	0.5%	1
Respiratory system and allergy medicines (R)	11 (14.1%)	1.8%	
Loratadine (R06AX13)	4 (5.1%)	0.6%	1
Cetirizine (R06AE07)	3 (3.8%)	0.5%	1
Fexofenadine (R06AX26)	2 (2.6%)	0.3%	1
Theophylline (R03DA04)	2 (2.6%)	0.3%	1
Musculo-skeletal system medicines (M)	6 (7.7%)	1.0%	
Tizanidine (M03BX02)	6 (7.7%)	1.0%	2
Genitourinary system medicines (G)	5 (6.4%)	0.8%	
Darifenacin (G04BD10)	3 (3.8%)	0.5%	2
Tolterodine (G04BD07)	2 (2.6%)	0.3%	2
Cardiovascular system medicines (C)	1 (1.3%)	0.2%	
Disopyramide (C01BA03)	1 (1.3%)	0.2%	1

The patient who scored 4 (DBI 1.83) was taking mirtazapine (score 1), darifenacin (score 2), and promazine (score 1) concurrently. Of ATC categories, most commonly prescribed medicines were psychotropic medicines, representing 12 medicines from 21 occurring in our population, and occurring in more than half of the patients that had at least one anticholinergic-acting medicine prescribed.

We also closely examined the prescription of most common medicines on our list. Prescribing doses and regimens are shown in Table 4.

Table 4. Dosing regimen for some of the most common anticholinergic medicines.

Medicine	Dose and frequency	N of cases
Diazepam	2mg daily	2
	5 mg daily	2
	5mg once to three times weekly	5
	5 mg twice monthly	1
Quetiapine	25 mg once daily	7
	100 mg once daily	1
	400 mg once daily	1
Ranitidine	150 mg once daily	8
	300 mg once daily	1
Amitriptyline	25 mg once daily	4
	25 mg two to three times daily	2

4 DISCUSSION

In our study, the prevalence of elderly general practice visitors taking anticholinergic medicines was low (12.5%). Most patients were taking only one medicine with low-potency anticholinergic effect. The most common were psychotropic medicines. Study population included patients from all parts of Slovenia apart from Pomurje and could, therefore, represent Slovenian population of older general practice visitors with chronic diseases.

A study in a cohort of community-dwelling older men showed the prevalence of exposure to anticholinergic medicine use between 13% and 39% using different instruments, while Salahudeen et al., found the prevalence of 22.8% to 55.9% depending on the scale which was used (14, 15), and Mayer et al., found prevalence of 9% to 31% in a cohort of general practice patients older than 50 years (5). Given these findings, the prevalence of anticholinergic medicines in our study was comparatively low. One of the reasons may be the instrument we used, which has been shown to have relatively high specificity in comparison to other scales (5). In addition, the elderly people participating in our study may have received different medicines, especially psychotropic ones, in comparison with a nursing home or hospitalised population.

Presence of anticholinergic medicines in elderly people is considered potentially inappropriate and may, therefore, be considered as one of the indicators of quality prescription. Additionally, one of the indicators could be the proportion of patients with a higher anticholinergic burden, which in our study was below 4% of all observed

patients for anticholinergic burden score, and even lower when the daily dosage of medicines was considered (only 1.6% patients had DBI 1 or higher). Comparing these numbers with other research is unfortunately difficult because of the poor agreement of various anticholinergic scales among themselves, which is about how great a burden individual medicine presents. Currently, there is no standard determining of still acceptable level of presence of anticholinergic medicines, such as in the case of prescribing of antibiotics (20), which makes it hard to judge how the prevalence of anticholinergics relates to the quality of care.

Despite the low prevalence, it is worrying that not only are the psychotropic medicines still the most common anticholinergic medicines present in the study population, but that the most commonly prescribed medicines are medicines that are inadvisable in elderly people according to several different sets of prescribing criteria (21, 22). This is especially important because multimorbid elderly people, who are already exposed to polypharmacy, are more likely to suffer from psychiatric disorders, like depression, anxiety or sleep disorders (23-25). Diazepam, a long-acting benzodiazepine, was present in 1.6% of patients in our study. In majority of the cases, the physicians prescribed it to be taken several times per week, not every day. However, due to a longer half-time in elderly people, this may not suffice to avoid adverse effects since the effects can linger to the next day even when taken a night before (26). In the second place was quetiapine, which raises concerns because of its common off-label use (27). It is often used for the treatment of insomnia in elderly, though evidence for such use is scarce (28) and there are concerns about adverse effects (29). Indeed, in all but two cases in our study, quetiapine was prescribed in a low dose of 25mg daily, which likely indicates just such a use. Similar concerns have been raised about other atypical antipsychotics on our list (30). Both quetiapine and risperidone are among the most commonly-used antipsychotics in Slovenia (31). In the third place, present in 1.1% of general practice patients, was paroxetine, which could be replaced by another SSRI inhibitor with weaker anticholinergic properties. Similarly, amitriptyline is not only inadvisable in elderly people, but was, in our study, also used in low doses probably ineffective for treatment of depression. Interestingly, all but one prescriptions of amitriptyline in our study were prescribed by just one physician.

Apart from psychotropic medicines, most commonly occurring in our study were medicines from ATC group A, chiefly ranitidine, and antihistaminic medicines from ATC group R. It is likely ranitidine could be replaced by a proton-pump inhibiting medicine either continuously or even as needed (32). In a similar vein, there are

antihistaminic medicines available that are not listed as having anticholinergic properties and could be exchanged for antihistaminic present on our list, thus decreasing the calculated anticholinergic burden.

Finally, less than 1% of our patients regularly received antimuscarinic medicine from ATC group G, which are commonly used to treat symptoms of urinary incontinence. Evidence does not encourage the use of these medicines in elderly, as the benefit is limited and there is concern about the side effects of medicines (33). In an Australian study, bladder instability was the most common problem that led to the prescription of a high potency anticholinergic medicine (34). In Slovenia, insurance rules demand that the first prescription of these medicines comes from urologists or gynaecologists, which may have contributed to decreased availability and therefore, lower prescription of these medicines (35).

It is likely that at least some of the anticholinergic medicines were prescribed by clinical specialists attending to the patients, for example, most atypical antipsychotics and bladder antimuscarinic medicines. In that case, general practitioners might be unwilling to change the prescription against a clinical specialist recommendation despite being aware of the possible anticholinergic side effects. However, in context of patient-oriented care, general practitioner should together with patient, weigh risks and benefits of medicines contributing towards anticholinergic burden and decide on continuing or discontinuing recommended medicines.

Altogether, we estimate that the majority of implicated medicines could probably be replaced by medicines with similar effect or from the same or similar class that is not present on Duran's anticholinergic list. This means that despite the low prevalence of anticholinergic medicines on our population, quality of prescribing in our cohort of general practice patients in regard to medicines with anticholinergic properties could be improved. However, as a caution, though anticholinergic medicines have been shown to correlate with a number of poor outcomes in elderly (falls, delirium, cognitive impairment, physical function, constipation, confusion and so on), the evidence for benefit in discontinuing anticholinergics is, as yet, scarce (36). In practice, as always, in addition to awareness of an anticholinergic burden of a particular patient's prescriptions and possibility of anticholinergic side effects, all physicians caring for older patients should use clinical judgment and trade-off of risks and benefits to guide prescribing and deprescribing in older adults.

There are some limitations to our study. We used Duran's scale, which does not consider the doses of anticholinergic medicines. The advantage of Duran's scale is the precise specification of included medicines, including ATC code. Because of this standardisation, it has been used several times since its development (5, 37). The scale has been

found to have a high specificity and to have a good correlation with a cognitive and functional decline and falls in observed population (5). Of the 100 medicines on Duran's list, however, 37 are not registered in Slovenia and could not be prescribed (33), which may have contributed to the low result. We excluded patients with severe dementia who were unable to answer the questionnaire and terminally ill patients with life expectancy of less than 1 year. Both might be the reason for the underestimation of anticholinergic burden since anticholinergic medicines are often used in these conditions. We only included older adults with at least one regularly taken medicine, so perfectly healthy elderly people who might lead to a decrease of prevalence of an anticholinergic burden were not in the study population. We did not consider the over-the-counter medicines that the patients could buy themselves; however, few medicines with anticholinergic properties are available over-the-counter in Slovenia, and as the national insurance covers medicines for a great majority of patients, the proportion of medicines bought over the counter that could influence our results is likely very small.

5 CONCLUSION

Although prevalence of anticholinergic medicines in our population was low, the examination of individual medicines indicates that it would be possible to decrease it further. The majority of anticholinergic burden was contributed by psychotropic medicines, several of which are inadvisable in elderly people and could be replaced by other medicines. Most common and likely to be possible medicines to avoid or replace by other medicines were diazepam, quetiapine, ranitidine, paroxetine and amitriptyline. General practitioners should avoid prescribing these medicines, particularly when a patient is already taking another medicine with possible anticholinergic effect and should be aware of the possibility of anticholinergic side effects in older people taking anticholinergic medicines when these cannot be avoided.

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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 reviewed and approved by Slovenian National Ethics Committee.

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WHAT CAN WE LEARN FROM EACH OTHER ABOUT UNDERGRADUATE MEDICAL EDUCATION IN GENERAL PRACTICE/FAMILY MEDICINE? KAJ SE LAHKO O DODIPLOMSKEM IZOBRAŽEVANJU NA PODROČJU DRUŽINSKE MEDICINE NAUČIMO DRUG OD DRUGEGA?

Irena ZAKARIJA-GRKOVIĆ^{1*}, Davorka VRDOLJAK¹, Venija CEROVEČKI²

¹University of Split, School of Medicine, Department of Family Medicine, Soltanska 2, 21000 Split, Croatia

²University of Zagreb, School of Medicine, Department of Family Medicine, Šalata 3, 10000 Zagreb, Croatia

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ABSTRACT

Introduction: There is a dearth of published literature on the organisation of family medicine/general practice undergraduate teaching in the former Yugoslavia.

Keywords:

general practice, family medicine, undergraduate teaching, former Yugoslavia, The Split Initiative

Methods: A semi-structured questionnaire was sent to the addresses of 19 medical schools in the region. Questions covered the structure of Departments of Family Medicine (DFM), organisation of teaching, assessment of students and their involvement in departmental activities.

Results: Thirteen medical schools responded, of which twelve have a formal DFM. Few DFM have full-time staff, with most relying upon external collaborators. Nine of 13 medical schools have family doctors teaching other subjects, covering an average of 2.4 years of the medical curriculum (range: 1-5). The total number of hours dedicated to teaching ranged from 30 - 420 (Md 180). Practice-based teaching prevails, which is conducted both in city and rural practices in over half of the respondent schools. Written exams are conducted at all but two medical schools, with the written grade contributing between 30 and 75 percent (Md=40%) of the total score. Nine medical schools have a formal method of practical skills assessment, five of which use Objective Structured Clinical Examinations. Student participation is actively sought at all but three medical schools, mainly through research.

Conclusion: Most medical schools of the former Yugoslavia recognise the importance of family medicine in undergraduate education, although considerable variations exist in the organisation of teaching. Where DFM do not exist, we hope our study will provide evidence to support their establishment and the employment of more GPs by medical schools.

IZVLEČEK

Uvod: V državah nekdanje Jugoslavije je zelo občutno pomanjkanje literature o organizaciji dodiplomskega izobraževanja na področju družinske medicine.

Ključne besede:

splošna medicina, družinska medicina, dodiplomsko poučevanje, države nekdanje Jugoslavije, Splitska iniciativa

Metode: Polstrukturiran vprašalnik smo posredovali na naslove 19 medicinskih fakultet. Vprašalnik je vseboval vprašanja o strukturi kateder za družinsko medicino, organizaciji izobraževanja, ocenjevanju študentov in njihovi vključenosti v dejavnosti kateder.

Rezultati: Odzvalo se je 13 fakultet, od tega jih ima 12 uradno katedro za družinsko medicino. Le nekaj kateder za družinsko medicino ima zaposleno osebje za polni delovni čas, večina pa se zanaša na zunanje sodelavce. Devet od 13 medicinskih fakultet zaposluje družinske zdravnike za poučevanje drugih predmetov, kar pokriva v povprečju 2,4 let medicinskega učnega načrta (razpon: 1-5). Celotno število ur, ki je posvečeno izobraževanju, se giblje med 30 in 420 (Md 180). Prevladuje izobraževanje, ki temelji na praksi, in se opravlja v mestnem okolju in na ruralnih območjih v več kot polovici fakultet, ki so se odzvale. Pisni preizkusi znanja se opravljajo na vseh fakultetah, razen dveh, pisna ocena pa prispeva k celotni oceni od 30 do 75 odstotkov (Md=40 %). Devet medicinskih fakultet uporablja uradno metodo za ocenjevanje praktičnih sposobnosti, pet od teh pa posega tudi po objektivno strukturiranem kliničnem preverjanju (Objective Structure Clinical Examination, OSCE). Aktivno sodelovanje študentov je zaželeno v vseh, razen na treh fakultetah, predvsem na raziskovalnem področju.

Zaključek: Večina medicinskih fakultet iz držav nekdanje Jugoslavije prepoznava pomembnost družinske medicine v dodiplomskem izobraževanju, čeprav obstaja veliko različic pri sami organizaciji poučevanja. Upamo, da bo naša študija prispevala k ustanavljanju kateder za družinsko medicino in k večjemu zaposlovanju splošnih zdravnikov na medicinskih fakultetah.

*Corresponding author: Tel. + 385 2 15 57 823; E-mail: irena.zakarija-grkovic@mefst.hr

1 INTRODUCTION

“Coming together is a beginning; keeping together is progress; working together is success”. These words, by Henry Ford, describe the series of events that have taken place in the countries of the former Yugoslavia among health professionals dedicated to the teaching of family medicine/general practice (FM/GP). The first Department of Family Medicine (DFM) in this part of Europe was founded in 1980 at the University of Zagreb, Croatia. This motivated other medical schools in the region to establish DFM. For almost 40 years now, they have been working towards developing family medicine into a recognised scientific, educational and professional discipline.

In order to follow and utilise the paths of cooperation already tested and developed in other medical disciplines, a group of Croatian and Slovenian teachers in FM/GP organised a continuous medical education course in October 2011, at the University of Split School of Medicine, Croatia, on the topic ‘Modern trends in teaching family medicine’. The course attracted a large number of participants and speakers from Slovenia (Ljubljana and Maribor), Bosnia and Herzegovina (Mostar), Montenegro (Podgorica) and Croatia (Zagreb, Osijek, Rijeka and Split), attesting to the need for mutual support and enlightenment among teachers of FM/GP. This was particularly relevant for those countries in the process of joining the European Union, which required them to adapt their curricula to European standards. Hence, the aim of the initiative, later named *The Split Initiative*, was to “renew our collaboration and to exchange information on the way we conduct teaching of family medicine”. (1) Given common past of the countries involved, similar languages and health systems (2), this initiative proved to be a success and has led not only to regular, annual meetings of the Split Initiative Group (Ljubljana ’13, Zagreb ’14, Podgorica ’15, Skopje ’16 and Sarajevo ’17) (3), each with its own carefully selected theme, but also to scientific collaboration, exchange of students/teachers and joint publications. (4) Most importantly, we believe this ongoing initiative has enabled its participants to regain confidence in their profession and in themselves, leading to a better-quality teaching in FM/GP and ultimately, better doctors.

An ongoing topic of interest among members of The Split Initiative is the organisation of undergraduate teaching in family medicine. Despite the similarities in the health and education systems between participant countries, numerous differences in approaches and content exist, revealing both obstacles and achievements in the pursuit of better teaching in family medicine. We felt that these similarities and differences, highlighted at our annual meetings, should be documented in a systematic and

objective manner, in the hope that, once published, they might offer our colleagues, including international readers, reference points for feedback into local and national educational boards. Our aim is to improve the position of academic FM/GP in Europe, especially in countries of South Eastern Europe where it may be less developed. Hence, a working group was appointed with the task of collecting the following data: 1) general information on DFM; 2) organisation of undergraduate teaching in FM/GP; 3) student assessment during FM/GP teaching; and 4) involvement of students in the activities of DFM.

2 METHODS

We used a cross-sectional study design, aimed at comparing the form and content of FM/GP teaching in medical schools from the region of the former Yugoslavia. A 5-page, semi-structured questionnaire with 45 questions was created for the purpose of this study and was revised several times following consultations with heads of DFM in Croatia and Slovenia and the Vice-Dean of Teaching at the University of Split School of Medicine. It consisted of four parts: 1) general information (establishment of a DFM, the structure of teaching staff, participation in the teaching of other subjects, number of enrolled students); 2) the organisation of teaching (number of lectures, seminars and practical classes, models of teaching, recommended literature, funding of field work, student obligations, dealing with absenteeism); 3) assessment (structure: written, oral, practical exam, thresholds, selecting questions, the final grade) and 4) cooperation with students (participation in meetings and activities of the department, student evaluation of teaching).

The questionnaire was sent by letter and e-mail in July 2015 to the valid addresses of 19, out of a total of 21, medical schools in the region of the former Yugoslavia (Banja Luka, Belgrade, Foča, Kragujevac, Ljubljana, Maribor, Mostar, Novi Sad, Osijek, Podgorica, Priština, Rijeka, Sarajevo, Skopje, Split, Štip, Tetovo, Tuzla and Zagreb). The questionnaire was addressed to heads of DFM or their representatives. Where there were no “heads of departments”, the questionnaire was addressed to the Dean or Vice-Dean for Teaching of the relevant medical school. Two follow-up reminder emails were sent at monthly intervals and personal contacts were utilised to facilitate the return of completed questionnaires. Data were analysed using MedCalc software (version 15) and methods of descriptive statistics.

3 RESULTS

A total of 13 out of 19 medical schools returned completed questionnaires, giving a response of 68%. We were able to obtain information on the teaching of FM/GP from the following medical schools: Belgrade (Serbia), Foča, Mostar, Sarajevo, Tuzla (Bosnia and Herzegovina), Ljubljana, Maribor (Slovenia), Osijek, Rijeka, Split, Zagreb (Croatia), Podgorica (Montenegro) and Skopje (Macedonia).

Almost all participating medical schools have a formal DFM, with the exception of The University of Belgrade, where it is in the process of being established. The first DFM was established in Zagreb, in 1980, and the most recent in Skopje, in 2010. In 11 out of 13 medical schools, FM/GP is taught as an independent subject, whereas in Osijek, it is part of the combined subject 'Family medicine, school medicine and medical sociology'. In Belgrade, it is taught during clinical rotations in the final semester of the medical course. The median number of students enrolled into the year in which FM/GP is taught is 90, ranging from 35 in Podgorica to 550 in Belgrade. The curriculum in FM/GP is available on the websites of all but three medical schools (Osijek, Foča, Tuzla).

Very few DFM have full-time staff employed by the medical school or visiting speakers (Table 1). Most departments have part-time staff employed in various arrangements, some spending only 10% of their time at the department and the rest in practice (e.g. Sarajevo), while others have a 50-50 arrangement. All medical schools, apart from Belgrade, rely upon a large number of external collaborators for teaching. Most medical schools have GPs/FM doctors teaching different subjects in multiple years, attesting to a high degree of interdepartmental and interdisciplinary collaboration. The maximum number of years covered by GP/FM staff is five (out of six), in Ljubljana, and the average is 2.4 (range: 1-5), with the final year of medicine most frequently covered. Subjects taught by GP/FM staff include 'Fundamentals of clinical practice', 'Medical informatics', 'Research in biomedicine', 'Communication skills', 'First aid', 'Breastfeeding medicine', 'Clinical skills' and 'Motivational interviewing'.

Table 1. Distribution of teaching staff at family medicine/general practice departments*.

Medical school (n=13)	Full-time staff	Part-time staff	Staff with academic/teaching title	External collaborators/practice mentors	Visiting speakers
Belgrade	0	0	0	0	2
Foča	1	1	2	4	0
Ljubljana	0	6	9	130	2
Maribor	0	1	2	100	0
Mostar	0	0	7	6	0
Osijek	1	1	0	21	0
Podgorica	0	1	1	3	1
Rijeka	0	7	0	10	0
Sarajevo	1	5	3	31	0
Skopje	0	0	2	60	0
Split	1	1	2	18	1
Tuzla	0	1	0	7	0
Zagreb	0	5	7	32	3

*Numbers only approximation, as definition of staff members in questionnaire is inadequate.

There was a considerable amount of variation in the total number of hours dedicated to the teaching of FM/GP, ranging from 30 (Skopje) to 420 (Maribor) with a median of 180 (Table 2). Practical classes (practice-based teaching) are the predominant form of teaching (M=99h; range:12-206), followed by seminars (M=27h; range: 2-60) and lectures (M=25h; range: 3-60). Seminars are mainly conducted as a combined effort of students and teaching staff, with only two medical schools (Split, Belgrade) applying the predominantly teacher led model. Practical classes are held in both city and rural GPs' offices in just over half of the medical schools, with the remainder of students spending time in city practices only. Expenses associated with practical classes (travel, accommodation, food) are covered by six out of 13 medical schools. Expectations of students during visits to GP offices include: practising clinical skills (n=12), keeping a diary (n=9), preparing a case study (n=8), spending time with the community nurse (n=7), writing letters to patients (n=4), filling out a questionnaire (n=3) and writing medical documents (n=1) (results not shown).

Table 2. Organisation of teaching in FM/GP.

Medical school (n=13)	Lectures (h)	Seminars (h)	Seminars: student led (S); teacher led (T) or both (B)	Practical classes (h)	Location of prac. classes city practice (C), rural practice (R) or both (B)	Expenses covered by medical school: yes (Y); no (N)	Total hours of teaching in FM/GP
Belgrade	20	15	T	85	C	N	120
Foča	60	10	S	120	B	N	180
Ljubljana	10	25	B	20	B	N	170
Maribor	15	60	B	120	B	Y	420
Mostar	22	44	B	114	B	Y	180
Osijek	18	40	B	130	B	Y	188
Podgorica	30	13	S	52	C	N	90
Rijeka	30	30	S	100	B	N	160
Sarajevo	45	9	B	146	C	Y	200
Skopje	3	12	S	12	C	N	30
Split	20	56	T	104	B	Y	180
Tuzla	30	2	S	206	B	Y	236
Zagreb	20	40	B	80	C	N	140

Written exams are conducted at all but two medical schools (Belgrade, Rijeka). The median cut-off mark is 60% (range: 51-70), with the written grade contributing to between 30 and 75 percent (Md=40%) of the total score in FM/GP (Table 3). In all medical schools with a written exam, multiple choice questions (MCQs) are used, with

an average of 57 questions per exam paper (range: 30-100) and 1.7 min allowed per question (range: 1-3 min.). In addition to MCQs, short answer and modified essay questions are employed by five and two universities, respectively.

Table 3. Assessment of undergraduate medical students in GP/FM: written exam.

Medical school (n=13)	Written exam Yes/No	% cut-off score	% of total score	Type of questions-MCQs	Type of questions-short answers	Type of questions-other	No. of questions/time (min.) per question
Belgrade	No	N/A [†]	N/A	N/A	N/A		N/A
Foča	Yes	60	50	Yes	Yes	MEQ*	50/1.5
Ljubljana	Yes	60	60	Yes	No		80/1.12
Maribor	Yes	60	70	Yes	No		50/1
Mostar	Yes	60	33	Yes	Yes		70/1
Osijek	Yes	60	33	Yes	Yes		60/2
Podgorica	Yes	51	30	Yes	No		30/1.5
Rijeka	No	N/A	N/A	N/A	N/A		N/A
Sarajevo	Yes	55	75	Yes	Yes	MEQ	arbitrary/3
Skopje	Yes	70	30	Yes	No		30/1.3
Split	Yes	60	30	Yes	No		30/2
Tuzla	Yes	60	66	Yes	Yes		66/3
Zagreb	Yes	60	40	Yes	No		100/1.5

*Modified Essay Question, † N/A: Not Applicable

Five out of 13 medical schools do not conduct an oral exam as part of the assessment in FM/GP (Belgrade, Maribor, Osijek, Podgorica, Tuzla). Of the remaining respondents, the majority allow students to draw questions, whereas at other medical schools, the examiner determines the question (Skopje, Zagreb), or a combination of both approaches is used (Foča, Ljubljana). Oral assessment represents between 10% and 45% of the total score in FM/GP (M=29). Table 4 shows details of the assessment

of practical skills in the FM/GP undergraduate program. Out of the 13 respondent medical schools, only three did not have a formal method of assessment of practical skills. Five medical schools run OSCEs (Ljubljana, Maribor, Mostar, Split, Tuzla). Overall, the practical exam comprises between 10% and 40% of the total score in FM/GP (M=25). No formal assessment of teaching in FM/GP is conducted at the medical school in Belgrade, given that the subject is part of clinical rotations/internship.

Table 4. Assessment of undergraduate medical students in GP/FM: practical exam.

Medical school (n=13)	Practical exam-OSCE Yes/No	Practical exam-patients Yes/No	No. of patients/student	OSCE set-up	% cut-off score	% of total score
Belgrade	No	No	N/A*	N/A	-	-
Foča	No	Yes	3	N/A	80	10
Ljubljana	Yes	No	N/A	9 stations	-	40
Maribor	Yes	No	N/A	Variable	60	15
Mostar	Yes	No	N/A	5 stations	33	33
Osijek	No	No	N/A	N/A	-	-
Podgorica	No	No	N/A	N/A	0	0
Rijeka	No	Yes	1	N/A	65	40
Sarajevo	No	Yes	1	N/A		25
Skopje	No	No	N/A	N/A	-	-
Split	Yes	No	N/A	6 stations	60	25
Tuzla	Yes	No	N/A	12 stations	60	20
Zagreb	No	Yes	20	N/A	-	20

*N/A- Not Applicable

Student participation is actively sought by GP/FM staff at all but three medical schools (Podgorica, Belgrade, Tuzla), usually in the form of participation in research (n=10) or conferences (n=7). In Split, students are invited to departmental meetings and in Zagreb, they organise additional, non-compulsory seminars in areas of interest. Students are also invited to evaluate GP/FM academic staff (results not shown) at all respondent medical schools (except for Skopje), either via official university surveys (n=11), internal departmental surveys (n=7) or both (n=6) (Belgrade, Maribor, Osijek, Rijeka, Tuzla, Zagreb).

4 DISCUSSION

The evaluation of undergraduate education in general practice/family medicine throughout Europe has shown that most universities in Europe have a GP/FM curriculum but in some European countries, it is still possible to graduate without having been exposed to GP/FM. The absence of a GP/FM curriculum is most evident in the countries of Eastern and Southern Europe (5). This study is one of the examples of successful interdepartmental and cross-national collaboration that has arisen from The Split Initiative, an annual gathering (since 2011) of teachers in FM/GP from the former Yugoslavia, aimed towards "renewing our collaboration and exchanging information on the way we conduct the teaching of family medicine" (1).

In 2012, the European Academy of Teachers in General Practice and Family Medicine (EURACT), announced a project "to establish and facilitate collaboration within the academic sphere of FM/GP" (6). We believe the results of this study will contribute to the objectives of the project, namely: 1) network and collaboration in basic medical education; 2) create a platform for the exchange of students and teachers; 3) contribute towards a teaching agenda for undergraduate education in FM/GP; 4) quality improvement of undergraduate (and post-graduate) teaching; 5) innovative approaches in undergraduate (and post-graduate) teaching and 6) supporting less developed departments/medical schools.

As expected, given that respondents are members of The Split Initiative, i.e., teachers in FM/GP, all participating universities have a GP/FM curriculum. In 11 out of 13 medical schools, FM/GP is an independent subject, whereas in the remaining universities, it is combined with other subjects or part of the final clinical rotations. It is known that countries with well-developed and strong family medicine have quality health care and better population health at lower costs (7). Family doctors are expected to solve most medical problems of the population in care, providing continuous and comprehensive health care. In light of that, teaching of family medicine is becoming

increasingly important. Mandatory family medicine clerkship and appropriate exposure to GP mentors as role models are essential for further professional development of every young doctor. Evidence shows that medical students can be encouraged to pursue GP/FM as a career if they undertake GP/FM curriculum, which is of sufficient quantity, quality and duration (8). Our findings attest to the rising importance of family medicine in the undergraduate medical curriculum.

In a descriptive study of undergraduate education in GP/FM (5), it was observed that as the length of the clinical teaching period in GP/FM increased, so did the number of level of years that are involved in the teaching of FM/GP. In our respondent medical schools, FM/GP is primarily taught during the final year of medicine, reflecting the relatively short time allocated to practice-based learning, amounting to a mean of 2.5 weeks. Brekke et al., are of the opinion that practice-based teaching (in a GP's office) should be offered for at least four weeks. Although practice-based teaching is only offered during final years of medicine in our sample, it is very encouraging to see participation between GP/FM staff with other departments within medical schools. Nine out of 13 GP/FM departments participate in teaching other subjects apart from FM/GP, including subjects seemingly unrelated such as 'Medical informatics', to traditional subjects such as 'Clinical skills' and 'Communication skills'. As stated by Švab "family medicine has a lot to offer medical schools" (9), therefore, it should be in our interest to share our knowledge and experience with as many colleagues as possible, and by doing so, expose medical students to the breadth, depth and beauty of family medicine.

All cross-sectional studies are limited by the timing of the study; hence our results may not be representative of the current situation. Another limitation of this study is the lack of definition for the term "departmental staff members". Some respondents calculated only the number of staff employed by the medical school, whereas others included clinical preceptors (practice mentors) as well. In addition, although our response rate is very good and comparable with other published studies, we still have "white spots on our map", i.e., lack information on the remaining eight medical schools in the region whom we were unable to contact or did not respond. All medical schools from Croatia, Montenegro and Slovenia were included, four out of five from Bosnia and Herzegovina, but only one out of four and one out of three are from Serbia and Macedonia, respectively, and none from Kosovo. Since this was not an individual survey but an institutional one, one would expect a response rate closer to 100%.

5 CONCLUSION

Our study reveals that the large majority of surveyed medical schools in the region of the former Yugoslavia has a formal DFM, in which family medicine is taught as an independent subject and is formally evaluated by students. This testifies to the importance of FM/GP in the education of future doctors and can be considered standard practice at medical schools. Hopefully, this will lead to the establishment of new departments of FM/GP, where they do not exist in Europe, as well as the employment of more GPs by medical schools. Additional incentives, revealed by our study, for the employment of teachers of FM/GP, are the versatility and breadth of knowledge and experience they possess, demonstrated by their involvement in the teaching of different subjects in multiple years of the undergraduate medical curriculum. The universal need for mutual support, acknowledgement and enlightenment among teachers of FM/GP is particularly relevant in countries where historically FM/GP has been less developed. We hope that this report might offer our colleagues reference points for feeding back into their local and national educational boards, with the aim of improving the position of academic FM/GP in Europe. Encouraging reports of these activities already exist (10).

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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 Ethics Committee of the University of Split School of Medicine (approval no.: 2181-198-03-04-15-0004).

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EMPATHY AND BURNOUT IN SLOVENIAN FAMILY MEDICINE DOCTORS: THE FIRST PRESENTATION OF JEFFERSON SCALE OF EMPATHY RESULTS

EMPATIJA IN IZGORELOST PRI SLOVENSKIH ZDRAVNIKIH DRUŽINSKE MEDICINE: PREDSTAVITEV PRVE UPORABE LESTVICE ZA SAMOOCENO EMPATIJE PRI ZDRAVNIKIH

Lea PENŠEK¹, Polona SELIČ^{1*}

¹University of Ljubljana, Faculty of Medicine, Department of Family Medicine,
Poljanski nasip 58, 1000 Ljubljana, Slovenia

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ABSTRACT

Background: Study aimed to assess the burnout prevalence and level of empathic attitude in family medicine doctors (FMDs) and its associations with demographic factors, working conditions and physician health, using the Jefferson Scale of Empathy - Health Professional version (JSE-HP).

Keywords:

empathy,
professional
burnout, emotional
exhaustion,
depersonalisation,
physicians,
family medicine,
workload, primary
care

Methods: Slovenian FMDs (n=316, response rate 56%) completed an online socio-demographic questionnaire, with questions on working conditions, physician health, and the Slovenian versions of the Maslach Burnout Inventory (MBI) and the JSE-HP. Univariate and multivariate analyses were used, applying linear regression to calculate associations between demographic variables, factors of empathy and burnout dimensions, P<0.05 was set as a limit of statistical significance.

Results: Of the 316 participants, aged 40±10.2 years, 57 (18%) were men. The FMDs achieved mean scores on the JSE-HP (JSE_{tot}) of 112.8±10.2 and on the MBI 27.8±11.6 for EE, 10.8±5.5 for D and 33.5±6.0 for PA. High burnout was reported in one dimension by 24.8% of participants, in two by 17.2%, and by 6% in all three dimensions. Multivariate analysis revealed a higher EE and D and lower PA in specialists as opposed to trainees. Higher EE was also identified in older physicians having longer work experience, working in a rural setting, dealing with more than 40 patients/day and having a chronic illness. The latter was also associated with higher JSE_{tot}. JSE_{tot} was negatively associated with D, while PA was positively associated with JSE_{tot} and Perspective Taking.

Conclusion: The incidence of burnout warns both physicians and decision-makers against too heavy workload, especially in older professionals.

IZVLEČEK

Ključne besede:

empatična
naravnost,
upoštevanje
zornega kota
drugega,
izgorelost,
čustvena
izčrpanost,
razosebljenost,
osebna
izpolnitev,
zdravniki,
družinska
medicina

Izhodišča: V družinski medicini empatična naravnost pri komunikaciji z bolnikom pripomore k učinkovitosti na več ravneh: poveča se zadovoljstvo bolnikov in izboljša njihovo sodelovanje ter zmanjša se izgorelost zdravnikov in izboljša njihovo počutje. Namen raziskave je bil opredeliti stopnjo izgorelosti in empatične naravnosti, odkriti socialno-demografske značilnosti in značilnosti dela, povezane z obema entitetama, ter prvič uporabiti in preveriti prevedeno in prirejeno lestvico za samooceno empatične naravnosti pri zdravnikih.

Metode: V presečni raziskavi so slovenski specializanti in specialisti družinske medicine (n = 316, 56-odstotni odziv) odgovarjali na spletni vprašalnik, ki je spraševal po socialno-demografskih značilnostih, delovnih pogojih in zdravstvenem stanju, dodani sta bili lestvici za samooceno izgorelosti MBI (angl. Maslach Burnout Inventory) in empatične naravnosti JSE-HP (angl. Jefferson Scale of Empathy - Health Professional version), za kateri so bile v procesu preverjanja s konfirmatorno faktorsko analizo določene psihometrične lastnosti. Univariatna statistična analiza je zajemala t-test za neodvisne vzorce, enofaktorsko analizo variance in Pearsonov korelacijski koeficient. Multivariatna analiza povezanosti demografskih spremenljivk in faktorjev empatije z dimenzijami izgorelosti (čustvena izčrpanost (ČI), razosebljenost (R), osebna izpolnitev (OI)) je bila izračunana z linearno regresijo. Vrednost p < 0,05 je določala mejo statistične pomembnosti.

Rezultati: Vzorec je zajemal 316 sodelujočih, od tega 57 (18 %) moških in 259 (82 %) žensk, povprečna starost je bila 40 ±10,2 let. Zdravniki so dosegli povprečno skupno vrednost na JSE-HP (JSE_{tot}) 112,8 ±10,2. Povprečne vrednosti na MBI so bile 27,8 ±11,6 za ČI, 10,8 ± 5,5 za R in 33,5 ±6,0 za OI. Največ zdravnikov je navajalo visoko izgorelost v eni dimenziji (24,8 %), 17,2 % v dveh in 6 % v vseh treh. Specialisti so v primerjavi s specializanti kazali višjo ČI (B = 0,28; p < 0,001) in R (B = 0,17; p = 0,026) ter nižjo OI (B = -0,20; p = 0,004). Višjo ČI so navajali starejši zdravniki (r = 0,213; p < 0,001), zdravniki z daljšo delovno dobo (r = 0,185; p = 0,001), zdravniki v ruralnih ambulantah (B = 0,12; p = 0,043), ki opravijo 40 obravnav na dan in več (p = 0,014), ter tisti s kronično boleznijo (p = 0,002). Slednji so dosegali višjo JSE_{tot} (p = 0,010). Pokazala se je negativna povezava JSE_{tot} z R (r = -0,224; p < 0,001) in pozitivna z OI (r = 0,372; p < 0,001). Ta se je v dodatni multivariatni analizi pokazala pozitivno povezana s kognitivno komponento empatije, z zmožnostjo upoštevanja zornega kota drugega (B = 0,35; p < 0,001).

Zaključek: Lestvica za samooceno empatije se je pokazala kot učinkovit instrument. Zlasti pri starejših in bolj obremenjenih zdravnikih je povezava med empatično naravnostjo in izgorelostjo pomembno opozorilo tako za zdravnike kot tudi za odločevalce v zdravstveni politiki. Rezultati kažejo tudi na pomen stalne krepitve veščin v medosebnih odnosih v obliki suportivnih in interaktivnih izobraževanj.

*Corresponding author: Tel. + 386 31 379 707; E-mail: polona.selic@siol.net

1 INTRODUCTION

Empathy has been recognised as an important and powerful part of communication in general practice, strengthening the physician-patient relationship (1, 2). Burnout in family medicine doctors (FMDs) at the front line of health care, disrupts this relationship (3-6). An empathic attitude is described as the capacity to understand what another person is experiencing from within their frame of reference (7). Physicians with empathic attitudes experience greater patient satisfaction and better patient compliance and adherence to treatment (8, 9). In addition, they tend to face fewer medical errors (10), have improved health outcomes (11), report fewer symptoms of burnout and have better well-being (12). The concept of empathy consists of cognitive and affective components (13), with a known moderate correlation between the concepts of sharing understanding and sharing emotion in patient-care (14).

Almost 65% of European FMDs exhibit signs of burnout (3) with various and non-specific symptoms (6). As the response to chronic emotional and interpersonal stressors at work, burnout leads to reduced job performance (15); the physicians' behaviour can have a detrimental effect on the health of patients and lead to more malpractice suits (16) and patient dissatisfaction (17). In physicians, the heavy workload and the lack of financial and organisational resources are important risk factors for burnout (15, 18), with an intense empathic attitude leading to emotional exhaustion and causing burnout syndrome (19). Some studies determined depersonalisation to be the main reason for a decrease in empathic attitude (20).

In Slovenia, burnout has only been evaluated in family medicine trainees, who scored highly (71%) in at least one burnout dimension (21). This is the first study in Slovenian family medicine focusing on the relationship between empathy and burnout and aiming to assess the extent of burnout and the level of empathic attitude in FMDs, and also to explore their associations with socio-demographic factors, working conditions and health. The Jefferson Scale of Empathy (JSE) for physicians was used as a validated self-assessment tool for the first time in Slovenia (see Additional File).

2 METHODS

2.1 Participants and Procedure

This was a cross-sectional survey of Slovenian FMDs; 565 out of 1139 FMDs in Slovenia (22) were invited twice by e-mail to complete an online survey. The invitation was sent through the e-mail distribution lists of the Slovenian syndicate of FMDs (396 specialists' e-mail addresses) and family medicine trainees (169 trainees' e-mail addresses).

The questionnaire, which had been validated previously, comprised socio-demographic and other questions concerning working conditions, health and well-being, the Slovenian version of the Maslach Burnout Inventory (MBI) (4), and the Jefferson Scale of Empathy - Health Professional version (JSE-HP) (23, 24). The data were collected from April to June 2016.

The response rate was 56%; of 316 respondents, 123 (38.9%) were family medicine trainees and 193 (61.1%) were specialists (who had finished a four-year period of specialised training), aged 40 ± 10.2 years.

2.2 Instruments

2.2.1 Socio-Demographic Characteristics Questionnaire

The participants answered demographic questions assessing gender (male/female), age (years), time working in family medicine (years), marital status (single/married/in a relationship/widowed), and children (yes/no). Further questions regarded working conditions and working environment (urban/rural) and workload (the number of patients per day (<40/40-60/>60)), emergency care duty during the regular workday (yes/no), the number of nightshifts per month (0/1-3/ ≥ 4). At the end, there were some questions that concerned the self-reported health of the physician (the number of sick leave days per year (0/1-5/ ≥ 6), having a chronic illness (yes/no)) and their self-assessment of their general health, mood and emotional state on a five-point Likert-type scale (1=poor, 5=excellent).

2.2.2 Self-Assessment of Empathic Attitude

The JSE-HP (JSE in further text) was developed by Hojat et al. to evaluate the empathic capacity of practitioners in health professions, including physicians (23, 24). It consists of 20 items, which use a 7-point Likert-type scale (1=strongly disagree, 7=strongly agree) to elicit responses, with a score range of 20-140 (24). Previous studies have suggested a three-factor structure, with the components being Perspective Taking, Standing in the Patient's Shoes and Compassionate Care (24, 25). The first two subscales address the cognitive aspect of empathic behaviour/attitude (23). The validity and reliability of the JSE were evaluated (11, 23, 24); it has been translated into 53 languages and used in more than 80 countries worldwide (26). The only Slovenian study so far used the JSE in medical students (JSE-S) and confirmed the three-factor structure of the 18-item scale (13). For our study, the JSE was translated into Slovenian and the authorisation for its implementation was obtained. Cronbach's α coefficients for JSE subscales were 0.865 for Perspective Taking, 0.722 for Standing in the Patient's Shoes, 0.784 for Compassionate Care and 0.798 for the total of 20 items.

2.2.3 Self-Assessment of Burnout

The MBI is the gold standard for assessing burnout (4), using 22 items scored on a 7-point Likert-type scale (0=Never, 6=Every day). The MBI consists of 3 subscales: Emotional Exhaustion ((EE), 9 items, score range from 0 to 54); Depersonalisation ((D), 5 items, score range from 0 to 30); and Personal Accomplishment ((PA), 8 items, score range from 0 to 48). High scores on the EE and D subscales, combined with low scores on the PA subscale, indicate high levels of burnout. Cut-offs for high burnout were determined by the upper quartile for each dimension, and were for EE>37, for D>15 and <30 for PA. Slovenian version of MBI (27) was used and Cronbach's α for EE subscale was 0.929, 0.765 for D and 0.801 for PA. The MBI has previously been tested and used several times on groups of healthcare staff, including FMDs (3, 6, 21).

2.2.4 Results of Confirmatory Factor Analysis for MBI and JSE

The confirmatory factor analysis was used to address psychometric properties and measurement invariance of MBI and JSE (28). We calculated the average variance extracted (AVE), maximum shared variance (MSV) and average shared squared variance (ASV) for the items loading on a construct. Conducted AVEs in Table 1 were all above 0.5, which represents a good conversion of MBI and JSE items (29). The resulting 3-factor structure for both MBI and JSE were confirmed as adequately fitting the data. For measurement invariance, the comparative fit index (CFI) and the root mean square error of approximation (RMSEA) were measured. Given that that CFI values were above 0.9 and RMSEA values were below 0.08, this was considered as acceptable (30, 31).

2.3 Data analysis

The sample was presented by the frequency and percentage distribution or by the values of the mean and standard deviations. Univariate statistical analysis included various statistical tests: the t-test for independent samples, the one-way analysis of variance, Pearson's correlation coefficient and Spearman's correlation coefficient. G*Power software (version 3.1.9) was used to calculate the achieved statistical power (32). Firstly, the confirmatory factor analysis was used to address psychometric properties and measurement invariance. In multivariate analysis, linear regression was used to calculate the associations between demographic variables, factors of empathy and burnout dimensions (EE, D, PA). The results of linear regression were presented by β coefficient, t value and p-value. All the analyses were performed using the SPSS version 22.0 for MS Windows (IBM Corp., Armonk, NY), with the significance set at $p < 0.05$. Additionally, multiple comparisons bias was addressed by changing the level of statistical significance ($p < 0.001$).

Table 1. Psychometric properties and measurement invariance by gender and age of the MBI and JSE scales.

Psychometric properties	AVE	MSV	ASV
MBI: Emotional Exhaustion	0.572	0.028	0.014
MBI: Depersonalisation	0.516	0.031	0.016
MBI: Personal Accomplishment	0.552	0.030	0.015
JSE: Perspective Taking	0.584	0.027	0.014
JSE: Standing in the Patient's Shoes	0.512	0.032	0.017
JSE: Compassionate Care	0.550	0.030	0.015

Measurement invariance	MBI scale		JSE scale	
	CFI	RMSEA	CFI	RMSEA
Gender: males (n=57) versus females (n=259)				
Configural invariance	0.932	0.026	0.944	0.020
Metric invariance	0.929	0.026	0.930	0.026
Scalar invariance	0.910	0.030	0.911	0.031
Age: 27-39 years (n=182) versus 40 years or above (n=134)				
Configural invariance	0.948	0.019	0.934	0.025
Metric invariance	0.940	0.021	0.930	0.026
Scalar invariance	0.920	0.027	0.918	0.027

AVE: average variance extracted, MSV: maximum shared variance, ASV: average shared squared variance

CFI: comparative fit index, RMSEA: root mean square error of approximation

3 RESULTS

Most of the responding FMDs were females (78.9% trainees and 83.9% specialists), working in this speciality for 11.2 ± 10.4 years. The majority were married or in an intimate relationship (272 (86.1%)), most of them had children (218 (69%)). At the time of the survey, more FMDs worked in urban (199 (63%)) than in rural (117 (37%)) settings. Approximately half of the participants had to provide emergency care during regular worktime (152 (48.1%)) vs. 164 (51.9%). A quarter did not work night shifts (75 (23.7%)), the same proportion reported night shifts at least 4 times per month, while one to three night shifts were reported by 166 (52.5%) respondents. Most of the participants examined at least from 40 to 60 patients per a working day (230 (72.8%)), 53 (18.7%) FMDs dealt with 60 or more patients per day and only a minority worked with less than 40 patients per day (33 (10.4%)).

Participants mainly reported no chronic illnesses (230 (72.8%)) and used either none (136 (43%)) or less than six sick leave days in a year (119 (37.7%)). Only 61 (19.3%) needed 6 or more sick leave days per year. Self-assessment of their general health was well (3.5 ± 0.9), the same for mood and emotional state (3.2 ± 0.9).

3.1 Empathic Attitude and Burnout Level in the FMDs

A mean total JSE score (JSE_{tot}) was 112.8 ± 10.2 ; mean scores of burnout dimensions were 27.8 ± 11.6 for EE, 10.8 ± 5.5 for D and 33.5 ± 6.0 for PA (Table 2). The highest proportion of physicians reported high burnout in one dimension (24.8%), 17.2% reported it in two and 6% in all three dimensions. Altogether, almost half (48%) reported high burnout in at least one dimension, while a quarter (25.2%) scored high in EE and even more in D (25.8%) and PA (26.2%).

3.2 Correlation between Socio-Demographic Factors, Working Conditions and JSE and MBI Scores

There were no statistically significant differences in the EE, D and PA scores according to gender, while older physicians and those with more work experience turned out to be more emotionally exhausted; however, the correlation was weak (Table 2). In regard to working conditions (patients per day, night shifts per month, emergency care duty), physicians who examined more than 40 patients per day had a higher EE. More characteristics are presented in Table 2.

Multivariate analysis revealed a higher EE, higher D and lower PA in specialists, compared to trainees. Physicians working in a rural environment were more emotionally exhausted than those in an urban area. A lower PA was associated with female gender, while physicians with children reported a higher PA, yet no significant correlations between marital status and burnout dimensions were identified. See Table 3.

3.3 Correlation between Physicians' Health, Empathic Attitudes (JSE_{tot}) and Burnout

Physicians with a chronic disease scored a higher JSE_{tot} and they were more emotionally exhausted. Subjective evaluations of physicians' general health, mood and emotional state were not significantly correlated with their empathic attitude, nor were the number of sick leave days. Details are in Table 2.

3.4 Correlation between Empathic Attitude and Burnout Dimensions

JSE_{tot} was weakly negatively correlated with D ($r = -0.224$, $p < 0.001$), yet the correlation between JSE_{tot} and PA was positive and of moderate strength ($r = 0.372$, $p < 0.001$). However, EE was not correlated to JSE_{tot} . Additional multivariate analysis positively associated Perspective Taking with PA (Table 3).

Table 2. Univariate analysis of JSE and MBI scores in FMDs by demographic characteristics, working conditions and health status (sick leave days per year, presence of chronic illness).

Categorical variables	n	EE			D			PA			JSE _{tot}		
		M	SD	t (p)	M	SD	t (p)	M	SD	t (p)	M	SD	t (p)
Score:	316	27.8	11.6		10.8	5.5		33.5	6.0		112.8	10.2	
Gender:		ES=0.3	P=0.5	1.686	ES=0.0	P=0.1	0.259	ES=0.3	P=0.5	1.819	ES=0.0	P=0.1	0.279
male	57	25.4	12.4	(0.093)	11.0	5.3	(0.796)	34.8	6.2	(0.070)	112.4	9.9	(0.780)
female	259	28.4	11.4		10.8	5.5		33.2	5.9		112.9	10.3	
Patients/day:		ES=0.5	P=0.7	2.481	ES=0.3	P=0.4	1.641	ES=0.1	P=0.1	0.613	ES=0.2	P=0.2	0.782
<40	33	23.1	11.0	(0.014)	9.4	5.0	(0.102)	34.1	5.3	(0.540)	114.2	8.4	(0.435)
≥40	283	28.4	11.6		11.0	5.5		33.4	6.1		112.7	10.5	
Night shifts/month:		ES=0.2	P=0.3	1.341	ES=0.2	P=0.3	1.404	ES=0.2	P=0.3	1.274	ES=0.0	P=0.1	0.292
<4	241	27.3	11.8	(0.181)	10.6	5.6	(0.161)	33.3	6.2	(0.204)	112.8	10.5	(0.771)
≥4	75	29.4	11.1		11.6	4.9		34.3	5.3		113.2	9.6	
Emergency care duty:		ES=0.2	P=0.4	1.742	ES=0.1	P=0.1	0.785	ES=0.2	P=0.4	1.812	ES=0.1	P=0.1	1.098
yes	152	29.0	11.1	(0.083)	11.1	5.4	(0.433)	34.1	5.4	(0.069)	113.5	10.2	(0.273)
no	164	26.7	12.0		10.6	5.6		32.9	6.4		112.2	10.3	
Chronic illness:				3.146			0.100			0.141			2.582
yes	86	31.3	11.4	(0.002)	10.8	5.9	(0.921)	33.4	5.8	(0.888)	115.4	9.9	(0.010)
no	230	26.6	11.5		10.9	5.3		33.5	6.1		112.0	10.2	
Continuous variables		r	p	r	p	r	p	r	p	r	p		
Age (years):		0.213 (P=0.9)	<0.001	-0.036 (P=0.1)	0.534	-0.009 (P=0.1)	0.872	0.080 (P=0.3)	0.161				
Years in current speciality:		0.185 (P=0.9)	0.001	-0.038 (P=0.1)	0.511	0.005 (P=0.1)	0.931	0.087 (P=0.3)	0.130				
Sick leave days/year: *		0.081 (P=0.3)	0.159	0.013 (P=0.1)	0.820	-0.054 (P=0.2)	0.348	0.037 (P=0.1)	0.525				

M: mean value, SD: standard deviation, t: Student's t-test, r: Pearson's correlation coefficient, df: degrees of freedom=314, ES: effect size (Cohen's d), P: achieved power

* Spearman's correlation coefficient was calculated for ordinal scale of sick leave

EE - Emotional Exhaustion, D - Depersonalisation, PA: Personal accomplishment, JSE_{tot} - total JSE score

Table 3. Multivariate analysis of associations between demographic factors, factors of empathy and individual burnout dimensions (EE, D, PA).

Categorical variables	EE			D			PA		
	B	t	p	B	t	p	B	t	p
Gender (female/male)	0.09	1.62	0.106	-0.03	-0.55	0.583	-0.12	-2.16	0.032
Working experience (specialist/trainee)	0.28	3.94	<0.001	0.17	2.24	0.026	-0.20	-2.92	0.004
Marital status (in a relationship/single)	-0.03	-0.55	0.582	-0.09	-1.51	0.133	-0.01	-0.12	0.907
Children (yes/no)	0.05	0.75	0.454	-0.03	-0.37	0.711	0.17	2.58	0.010
Working environment (rural/urban)	0.12	2.03	0.043	0.04	0.63	0.532	-0.06	-1.19	0.236
Years in current speciality	0.00	-0.01	0.995	-0.12	-1.64	0.103	0.00	0.02	0.988
Perspective Taking	0.05	0.82	0.413	-0.10	-1.53	0.127	0.35	5.80	<0.001
Standing in the Patient's Shoes	-0.04	-0.62	0.536	-0.11	-1.70	0.091	0.08	1.28	0.203
Compassionate Care	-0.07	-1.13	0.259	-0.10	-1.57	0.118	0.08	1.35	0.178
	R ² =0.129, df=9, p<0.001			R ² =0.078, df=9, p=0.006			R ² =0.224, df=9, p<0.001		

R²: Coefficient of determination

EE - Emotional Exhaustion, D - Depersonalisation, PA - Personal Accomplishment

4 DISCUSSION

This study assessed the level of empathic attitude and extent of burnout in Slovenian FMDs, and tested associations between JSEtot and individual burnout dimensions with socio-demographic factors, working conditions and physician health (Tables 2, 3). Psychometric properties of Slovenian MBI and JSE scales are also presented (Table 1), introducing the Slovenian version of JSE as validated and highly recommended instrument.

The participants reported a higher level of burnout when comparing mean values for each dimension with European FMDs (Table 2) (3, 33) and Slovenian family medicine trainees (21). A large cross-national burnout study (34) included Slovenian psychiatry trainees, but used a 16-item MBI-GS scale, which made the comparison very difficult. Another hurdle is different speciality, given that psychiatrists could exhibit even higher burnout and have different work process than FMDs. The positive association between emotional exhaustion and age and work experience (Table 2) was identified, concordant with a Slovenian study of family medicine trainees results (21). Maslach (15) discovered greater burnout in those at the beginning of their careers, but warns of survival bias. With regard to work experience, specialists reported higher burnout scores in all three dimensions, in comparison to trainees (Table 3). This is plausible, considering the situation in the Slovenian healthcare system, with specialists taking on an even higher workload, i.e., an excessive number of patients and extensive bureaucracy (35). The overall higher burnout in specialists (Table 3) could be attributed also to the sampling method.

Slovenian female FMDs reported lower personal accomplishment than males (Table 3), while in an European burnout study (3), a strong association between male gender and a high score in all three burnout dimensions was found. Parenting was associated with higher personal accomplishment scores, whereas living in an intimate partnership was not associated with any dimension of MBI (Table 3). Parenting probably shapes personality more than having a partner, in terms of hardiness, self-esteem, non-avoidant coping style, which are found to protect against burnout (15). An increased tendency to experience burnout in those who are single or not married was reported previously (15), while Park et al. reported of no correlation between MBI and marital status or parenting (36).

The correlation between workload and emotional exhaustion (Table 2), supported by the findings highlighting difficult working conditions in Slovenian primary health care, with 90% of physicians dealing with at least 40 patients and 20% with at least 60 patients per day (Table 2), is concordant with a previous Slovenian study of family medicine trainees and Croatian FMDs (21,

37). An additional burden was demonstrated in those working in rural family medicine clinics (Table 3), which is concordant with the study in which those working in rural settings scored higher on the MBI (28).

Unlike burnout, there are few studies that deal with physicians' empathy, yet research into this topic is on the rise (38). It is difficult to compare scores for empathic attitude, as different instruments and study populations were in use (39, 40). The FMDs in this study reached a JSEtot (Table 2) comparable to that of medical students (40, 41), but the scores were lower than in doctors in other studies (11, 24). These findings could be attributed to cultural, educational and organisational differences of studied populations. Some other researchers also shortened the scale to improve internal consistency (13, 36). Literature often describes greater empathy in female physicians and medical students (1, 13, 19, 24, 36, 40-42), but no correlation between gender and empathic attitude was discovered in this study (Table 2).

FMDs with a chronic illness reported higher emotional exhaustion and showed a higher empathic attitude (Table 2). Physical illness affecting burnout has not yet been adequately researched and there is a high possibility of burnout in the presence of a persistent stressor, such as chronic disease (43). The impact of chronic illness on empathic capacity was examined in some qualitative studies, showing greater empathy in those who had experienced illness themselves (44).

More empathic participants felt greater personal accomplishment (Table 2), similarly to studies of Spanish (42) and French (45) FMDs and to family medicine trainees (20); physicians with greater empathic attitudes were reported to be less emotionally exhausted (36). Cognitive component of empathy (Perspective Taking) was associated with greater personal accomplishment (Table 2), similarly to Paro et al. (46), who reported personal accomplishment to be significantly associated with decreasing personal distress and which was found to be a reliable predictor for perspective taking. Some research shows that deficits in perspective taking alone might be a risk for burnout, whereas higher perspective taking and empathic concern might be protective (19, 47).

Given that multiple comparisons bias was additionally addressed by holding alpha error rate at 5% and changing the level of statistical significance ($p < 0.001$), this emphasised the most important results of this study, i.e., a positive association between emotional exhaustion and age and working experience ($r = 0.213$, $p < 0.001$) and ($\beta = 0.28$, $p < 0.001$), respectively), and between personal accomplishment and cognitive component of empathy ($\beta = 0.35$, $p < 0.001$). That is concordant with several previous studies and strengthens the reliability of association between empathy and burnout. Contrary

to previous studies, the correlations between age and burnout in FMDs could be explained by the Slovenian health care system organisation.

In this study, organisational issues are shown to be a high risk factor for burnout (Table 2), high workload being an issue in Slovenia as well as in other developed countries (3, 15, 37). The situation in the country, with an aging population, the lack of physicians working in primary care, a decrease in interest in family medicine residencies, and shortage of time for the patient (48), suggests an urgent need for psychological help and support for FMDs, taking into consideration empathic attitude, which is associated with the feeling of personal accomplishment.

This study, being the first in Slovenia to assess burnout and empathic attitude in trainees and specialists in family medicine, and with a satisfactory response rate (56%), opens a new dimension of the physician-patient relationship and emphasises the empathic approach to family medicine. The results from this study could be the starting point for a discussion on the restructuring of curricula for both medical students and family medicine trainees, and support for the work of specialists, since FMDs work in relative isolation in their outpatient clinics and are deprived of peer support, as capacity building was shown to be empowering (49, 50). Additionally, the Slovenian version of JSE is presented and could be applied in further research.

4.1 Limitations of the Study

One of the main limitations of our research is sampling, being of convenience, with only a part of FMDs (members of syndicate and trainees) and not all FMDs were approached. Secondly, as the study was cross-sectional, the responses were analysed at a certain moment. Furthermore, self-assessment scales, such as JSE and MBI, are subjective and biased, as they are based on the respondent's self-observation. Finally, there was also a slightly larger proportion of women included in the study (82%), compared to female FMDs in Slovenia (73.5%, (51)). Therefore, further research is needed on representative, random samples that would confirm our findings, especially prospective longitudinal studies to explore the association between empathic attitude and burnout.

5 CONCLUSIONS

The associations between emotional exhaustion, workload, age and work experience, depict important issues of Slovenian family medicine. Given that the association between burnout and empathy was confirmed, the importance of learning empathic communication and peer-support-based capacity building in FMDs for the prevention of burnout have been shown. There is a need for further intervention studies in medical students and FMDs, in order to evaluate these findings, elaborate peer support interventions and enhance the quality of patient care.

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CONFLICTS OF INTEREST

The authors declare that no conflicts of interest exist.

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ETHICAL APPROVAL

Research was conducted according to ethical principles and was approved by the National Ethics Committee in 2016, reference number 0120-206-2016.

ABBREVIATIONS

JSE-HP- Jefferson Scale of Empathy-Health Professional version; MBI - Maslach Burnout Inventory; JSE_{tot} - total score on JSE-HP; FMD - family medicine doctor; EE - Emotional Exhaustion; D - Depersonalisation; PA - Personal Accomplishment.

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APPENDIX

LESTVICA ZA SAMO-OCENJEVANJE EMPATIČNE NARAVNANOSTI po Jeffersonu (JSE – HP version – Slovenian)

Navodila: Uporabite kemični svinčnik in označite stopnjo strinjanja z vsako od navedenih trditev tako, da s križcem označite številko, ki najbolj ustreza stopnji vašega strinjanja s trditvijo.

Prosimo, da uporabite navedeno 7-stopenjsko lestvico (višja številka na lestvici pomeni večjo stopnjo strinjanja s trditvijo. Označite samo eno številko pri vsaki trditvi.

	se nikakor ne strinjam				se povsem strinjam		
1. Moje razumevanje počutja bolnikov in njihovih družin ne vpliva na medicinsko ali kirurško zdravljenje.	1	2	3	4	5	6	7
2. Moji bolniki se počutijo bolje, če razumem in upoštevam njihova čustva.	1	2	3	4	5	6	7
3. Težko mi je gledati na stvari iz zornega kota bolnikov.	1	2	3	4	5	6	7
4. V odnosu med zdravnikom in bolnikom je razbiranje nebesednih sporočil enako pomembno kot besedna plat sporazumevanja.	1	2	3	4	5	6	7
5. Imam dober smisel za humor, kar po moje prispeva k boljšemu kliničnemu izidu.	1	2	3	4	5	6	7
6. Ker so ljudje različni, je zame težko gledati na stvari iz zornega kota bolnikov.	1	2	3	4	5	6	7
7. Pri pogovoru z bolniki in jemanju anamneze se trudim, da ne polagam pozornosti na njihova čustva.	1	2	3	4	5	6	7
8. Upoštevanje bolnikovih osebnih izkušenj ne vpliva na izid zdravljenja.	1	2	3	4	5	6	7
9. Pri obravnavi bolnikov si skušam predstavljati, kako je »v njihovih čevljih«.	1	2	3	4	5	6	7
10. Moji bolniki cenijo moje razumevanje njihovih čustev, kar je samo po sebi terapevtsko.	1	2	3	4	5	6	7
11. Bolezni lahko pozdravimo zgolj z medicinsko ali kirurško obravnavo; čustvene vezi z mojimi bolniki pri tem niso pomembne.	1	2	3	4	5	6	7
12. Menim, da je spraševanje bolnikov o dogajanju v njihovem življenju nepomemben dejavnik pri razumevanju njihovih telesnih težav.	1	2	3	4	5	6	7
13. Da bi lažje razumel(a), kaj bolniki mislijo in čutijo, sem pozoren(a) na njihovo nebesedno sporočanje (način govora in govornico telesa).	1	2	3	4	5	6	7
14. Verjamem, da čustva niso pomembna pri zdravljenju bolezni.	1	2	3	4	5	6	7
15. Empatija je terapevtska veščina, brez katere je moja uspešnost zdravljenja omejena.	1	2	3	4	5	6	7
16. Za moj odnos z bolniki je pomembno, da poznam njihovo čustveno stanje in dogajanje v njihovih družinah.	1	2	3	4	5	6	7
17. Zato da bi jih lahko bolje obravnaval(a), poskušam razmišljati kot moji bolniki.	1	2	3	4	5	6	7

18. Ne dovolim si, da bi name vplivale tesne osebne vezi med bolniki in njihovimi družinskimi člani.	1	2	3	4	5	6	7
19. Ne uživam v branju nestrokovne (nemedicinske) literature ali ob umetniških delih.	1	2	3	4	5	6	7
20. Prepričan(a) sem, da je empatija pomemben terapevtski dejavnik v procesu zdravljenja.	1	2	3	4	5	6	7

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Algoritem točkovanja za lestvico JSE

Vprašani mora odgovoriti na vsaj 16 (80 %) od 20 trditvev, sicer je obrazec nepopoln in ga je treba izključiti iz analize podatkov.

V primeru, da ne odgovori na 4 ali manj trditvev, se manjkajoče vrednosti nadomestijo s povprečno vrednostjo trditvev, na katere je sodelujoči odgovoril.

Točkovanje lestvice: Trditve 1, 3, 6, 7, 8, 11, 12, 14, 18 in 19 se točkujejo obratno (tj. *se popolnoma strinjam=1...se nikakor ne strinjam=7*), medtem ko se ostale trditve točkujejo skladno z Likertovo lestvico (tj. *se nikakor ne strinjam=1...se popolnoma strinjam=7*).

Skupno število točk je seštevek točk za posamezne trditve. Višja dosežena celokupna vrednost na vprašalniku kaže na večjo empatično naravnost.

POMEMBNO: Algoritem točkovanja je namenjen izključno za vrednotenje JSE obrazcev kupljenih za en sam projekt. Kopiranje ali deljenje algoritma je prepovedano.

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THE ROLE OF A SCHOOL NURSE IN THE CARE OF A CHILD WITH DIABETES MELLITUS TYPE 1 - THE PERSPECTIVES OF PATIENTS AND THEIR PARENTS: LITERATURE REVIEW

VLOGA ŠOLSKE MEDICINSKE SESTRE PRI NEGI OTROKA S SLADKORNO BOLEZNIJO TIPA 1 - VIDIKI BOLNIKOV IN NJIHOVIH STARŠEV: PREGLED LITERATURE

Anna STEFANOWICZ^{1*}, Joanna STEFANOWICZ²

¹Medical University of Gdansk, Faculty of Health Sciences with Subfaculty of Nursing and Institute of Maritime and Tropical Medicine, Subfaculty of Nursing, Department of Nursing, Department of General Nursing, Pediatric Nursing Workshop, Debinki 7, 80-211 Gdansk

²Medical University of Gdansk, Faculty of Medicine, Department of Paediatrics, Haemathology & Oncology, Debinki 7, 80-211 Gdansk

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ABSTRACT

Keywords:

diabetes mellitus type 1, children, nurses, schools

Introduction: The aim of this literature review was to explore the views of parents and children with type 1 diabetes mellitus regarding having a school nurse.

Methods: Six databases were selected for the analysis. The research strategy was based on the PICO model. The research participants were children with type 1 diabetes mellitus and/or their parents.

Results: The present review of research papers includes 12 publications. The majority of works deal with the perspectives of children with type 1 diabetes and their parents on various aspects related to the role of a school nurse in the care of a child with type 1 diabetes:

- the presence of a school nurse;
- the role of a school nurse in the prevention and treatment of hypoglycaemia, in performing the measurements of blood glucose, and in insulin therapy;
- the role of a nurse in improving metabolic control of children with type 1 diabetes;
- a nurse as an educator for children with type 1 diabetes, classmates, teachers, teacher's assistants, principals, administrators, cafeteria workers, coaches, gym teachers, bus drivers, and school office staff;
- a nurse as an organiser of the care for children with type 1 diabetes.

Conclusions: According to parents and children with type 1 diabetes mellitus, various forms of school nurse support (i.e., checking blood glucose, giving insulin, giving glucagon, treating low and high blood glucose levels, carbohydrate counting) are consistently effective and should have an impact on the condition, improvement of metabolic control, school activity and safety at school.

IZVLEČEK

Ključne besede:

sladkorna bolezen tipa 1, otroci, medicinske sestre, šole

Uvod: Namen tega sistematičnega pregleda literature je raziskati vlogo šolske medicinske sestre pri negi otrok s sladkorno boleznijo tipa 1 in pri podpori njihovih staršev.

Metode: Za analizo je bilo izbranih šest podatkovnih zbirk. Strategija raziskave je temeljila na modelu PICO. Zajeti so bili članki z opisi raziskav, v katerih so sodelovali otroci s sladkorno boleznijo tipa 1 in/ali njihovi starši.

Rezultati: Pregled literature vključuje 12 člankov. Večina se jih ukvarja s pogledom otrok s sladkorno boleznijo tipa 1 in njihovih staršev na vlogo šolske medicinske sestre pri negi otroka s sladkorno boleznijo tipa 1:

- prisotnost šolske medicinske sestre;
- vloga šolske medicinske sestre pri preprečevanju in oskrbi hipoglikemije, izvajanju merjenja glukoze v krvi in inzulinski terapiji;
- vloga šolske medicinske sestre pri izboljšanju nadzora presnove otrok s sladkorno boleznijo tipa 1;
- šolska medicinska sestra kot vzgojitelj otrok s sladkorno boleznijo tipa 1, sošolcev, učiteljev, pomočnikov učiteljev, ravnateljev, administratorjev, zaposlenih v kuhinji in jedilnici, trenerjev, učiteljev telovadbe, voznikov avtobusa in ostalega šolskega osebja;
- šolska medicinska sestra kot organizator nege otrok s sladkorno boleznijo tipa 1.

Zaključki: Po mnenju otrok s sladkorno boleznijo tipa 1 in njihovih staršev je podpora šolske medicinske sestre (tj. preverjanje vrednosti glukoze v krvi, dovajanje inzulina in glukagona, obravnava nizkih in visokih ravni glukoze, štetje ogljikovih hidratov) konsistentno učinkovita in vpliva na stanje, izboljšanje nadzora presnove, šolske dejavnosti in varnost otrok s sladkorno boleznijo tipa 1 v šoli.

*Corresponding author: Tel. + 48 58 349 19 23; E-mail: ania-stefanowicz@gumed.edu.pl

1 INTRODUCTION

Type 1 diabetes mellitus (T1DM) is one of the most common chronic incurable diseases of the developmental age in Europe (1).

The treatment of T1DM includes insulin therapy with the insulin dose individually adjusted, self-monitoring, proper nutrition, physical activity and health education (2).

Children and adolescents with T1DM should attend public educational institutions (3, 4). Therefore, properly organised diabetes care for a child with T1DM at school or preschool is very important for the proper individual and social development of the child. A school nurse is one of the people who participates in the care of children with T1DM and improves the safety of children with T1DM in school (3-5).

School nurses should ensure a sense of psychological and physical safety, prepare other children to deal with a schoolmate with T1DM, instruct them how to help during the occurrence of hypoglycaemia or hyperglycaemia, help a child with T1DM to accept the disease, and provide them with support. The good co-operation between the child, parents and school nurse is a key part of successful treatment.

The aim of this literature review was to explore the views of parents and children with T1DM on having a school nurse.

2 METHODS

This literature review was conducted from January to May 2016. Six databases were selected for the analysis: Scopus, The Cochrane Database of Systematic Reviews, PubMed, Web of Science, Science Direct Journals (Elsevier) and the Main Library of the Medical University of Gdansk.

The following terms were set as advanced search criteria: diabetes mellitus, type 1 diabetes mellitus, children, school age, school nurses, school, school environment. The time frame inclusion criteria were years from 2001 to 2015.

The research strategy was based on the PICO model (P - PATIENTS, I - an INTERVENTION, C - a COMPARISON, O - an OUTCOME), which allows the establishment of a precise clinical question (6).

In this work, the research question was as follows: What are the views of parents and children with T1DM on having a school nurse?

Thus, the following elements of the PICO process were determined as follows:

P - PATIENTS: school children with T1DM;

I - INTERVENTIONS: the presence of a nurse in the school;

C - COMPARISON: lack of nurses in the school;

O - OUTCOME: the perceptions of children with T1DM and their parents.

The terms used for the search for selected literature were specified according to the MeSH dictionary (Medical Subject Headings) included in Table 1.

Table 1. Terms used to search the literature.

POPULATIONS/ INTERVENTIONS * MeSH term / ** free text	OUTCOME * MeSH term / ** free text
diabetes mellitus*	perception*
type 1 diabetes mellitus**	perceptions of parents and children**
children**	having a school nurse**
school age**	
school nurses**	
school**	
school environment**	
OR	OR
AND	

Operators AND and OR were used. The following criteria were applied to include particular works in the study: children, type 1 diabetes mellitus, parents, nurse, school nurse, school, perceptions, articles in English, and full-text articles. The following criteria were excluded: type 2 diabetes mellitus, adults, animals, and articles in languages other than English. Works presented only in the form of abstracts were rejected.

Thirteen articles were rejected due to an inappropriate topic, character of the articles or poor quality (Table 2).

Table 2. Assessment of undergraduate medical students in GP/FM: written exam.

No	Type of work	Works that were analysed	Works that were removed from the analysis
1.	research works	<p>Driscoll KA et al. Florida (USA); SCOPUS (ELSEVIER) (3)</p> <p>Amilltegui B et al. Madrid (Spain) - PubMed (7)</p> <p>Cox ED et al. Madison (USA); ScienceDirect Journals (Elsevier) (8)</p> <p>Hayes - Bohn R et al. Canada; Web of Science (formerly Web of Knowledge) (9)</p> <p>Hellems MA & Clarke WL Virginia (USA); Web of Science (formerly Web of Knowledge) (10)</p> <p>Lehmkuhl H & Nabors L Florida (USA); Web of Science (formerly Web of Knowledge) (11)</p> <p>Nguyen T.M. et al. Houston (Texas); PubMed (12)</p> <p>Peery Al et al. East Carolina (USA); SCOPUS (13)</p> <p>Schwartz F et al. Ohio (USA); PubMed (14)</p> <p>Skelley JP et al. Alabama (USA); SCOPUS (ELSEVIER) (15)</p>	<p>Boden S et al. Warwick (UK); Web of Science (formerly Web of Knowledge) (18)</p> <p>Chien SC et al. - Chiba (Japan) and Tainan City (Taiwan); ScienceDirect Journals (Elsevier) (19)</p> <p>Ginsburg KR et al. Philadelphia (USA); Web of Science (formerly Web of Knowledge) (20)</p> <p>Guo J et al. Changsha, Hunan Province (China); PubMed (21)</p> <p>Marshall M et al. Manchester (UK); PubMed (22)</p> <p>Nabors L et al. Cincinnati (USA); Web of Science (formerly Web of Knowledge) (23)</p> <p>Pinelli L et al. Verona (Italy); SCOPUS (ELSEVIER) (24)</p> <p>Rankin D et al. Edinburgh (UK); Web of Science (formerly Web of Knowledge) (25)</p>
2.	literature reviews	<p>Edwards D et al. Bangor (UK); PubMed (16)</p> <p>Kelo M et al. Helsinki (Finland); Web of Science (formerly Web of Knowledge) (17)</p>	<p>Clar C et al. - Berlin (Germany); Cochrane Library (26)</p> <p>Marks A et al. Sydney (Australia); PubMed (27)</p> <p>Parab ChS et al. North Wollongong (Australia); Cochrane Library (28)</p>
3.	series of cases		<p>Babler E & Strickland CJ - Seattle (USA); ScienceDirect Journals (Elsevier) (29)</p> <p>Freeborn D et al. Provo (USA); ScienceDirect Journals (Elsevier) (30)</p> <p>Marshall M et al. Preston (UK); Web of Science (formerly Web of Knowledge) (31)</p> <p>Schmidt C et al. Carbondale (USA); SCOPUS (ELSEVIER) (32)</p>
4.	recommendation American Diabetes Association		<p>Jackson CC et al (USA); Web of Science (formerly Web of Knowledge) (33)</p>

The final analysis included 10 research works and 2 literature reviews.

Three studies that were found in the collections of the Main Library of the Medical University of Gdańsk (2 BA and 1 MA dissertations) were rejected. Those theses were not related to school nurses.

The PRISMA flow diagram illustrates the process of a systematic review (Figure 1) (34).

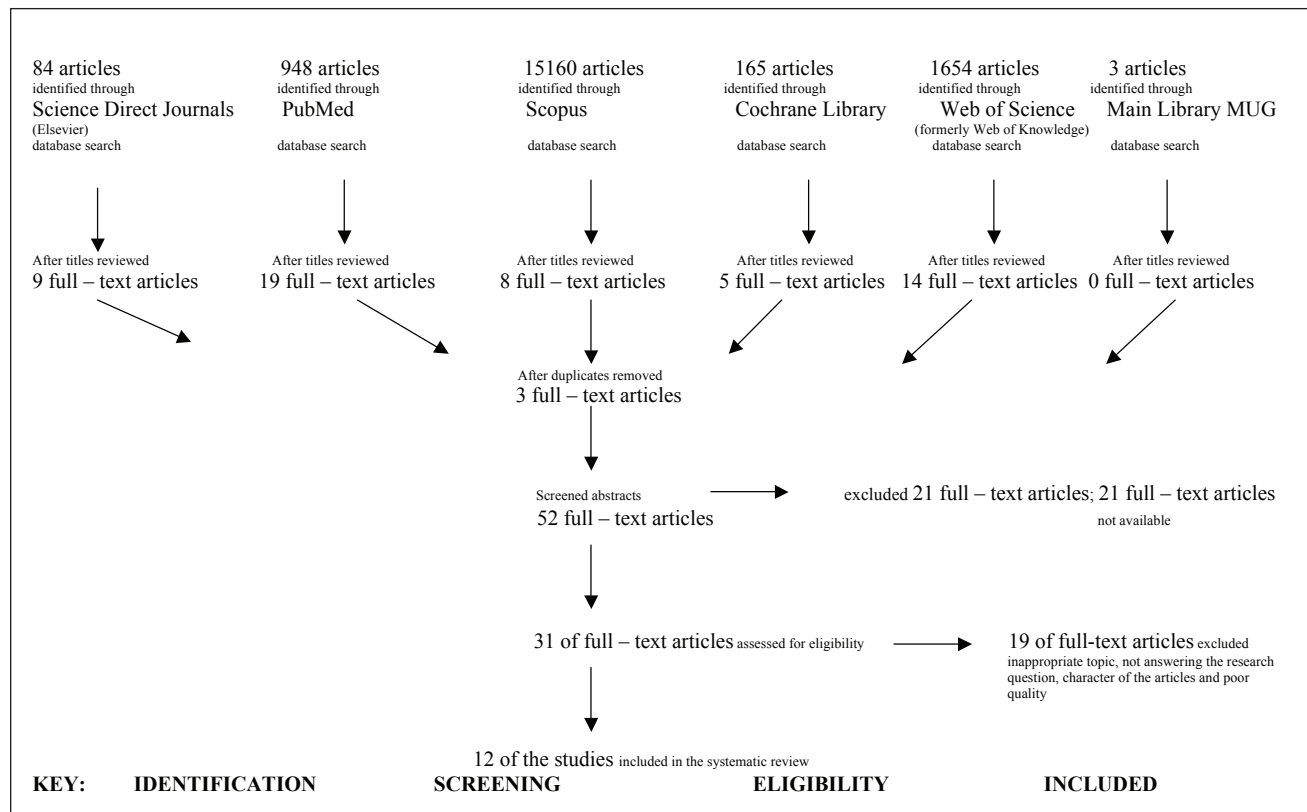


Figure 1. PRISMA Flow diagram (type 1 diabetes mellitus & perception) (34).

3 RESULTS

The presented review includes 12 publications. The majority of the studies deal with the perspectives of children with T1DM and their parents on various aspects related to the role of a school nurse in the care of a child with T1DM, including the following:

- the presence of a school nurse;
- the role of a school nurse in the prevention and treatment of hypoglycaemia, in performing measurements of blood glucose, and in insulin therapy;
- the role of a nurse in improving the metabolic control;
- a nurse as an educator for children with T1DM, classmates, teachers, teacher's assistants, principals, administrators, cafeteria workers, coaches, gym teachers, bus drivers, and school office staff;
- a nurse as an organiser of the care for children with T1DM.

The studies including the above-mentioned aspects are presented in Table 3. Table 3 also presents information about the evaluation of the work based on the principles of evidence-based medicine (35).

Table 3. The role of a school nurse in the care of a child with T1DM - the perspectives of parents and children.

No	The perspectives	Works	Grade of Evidence (35)
1.	the presence of a school nurse	Amilltegui B et al. (7)	2b
		Cox ED et al. (8)	2b
		Edwards D et al. (16)	3a
		Hayes - Bohn R et al. (9)	3b
		Hellems M A. & Clarke WL (10)	3b
		Kelo M et al. (17)	3a
		Nguyen TM et al. (12)	2b
		Schwartz F et al. (14)	3a
		Skelley JP et al. (15)	3a
2.	the role of a school nurse in the prevention and treatment of hypoglycaemia, in performing the measurements of blood glucose, in insulin therapy	Driscoll K.A et al. (3)	3a
		Hayes - Bohn R et al. (9)	3b
		Hellems MA & Clarke WL (10)	3b
		Lehmkuhl H & Nabors L (11)	3b
3.	the role of a nurse in improving metabolic control	Driscoll KA et al. (3)	3a
		Edwards D et al. (16)	3a
		Lehmkuhl H & Nabors L (11)	3b
		Nguyen TM et al. (12)	2b
4.	a nurse as an educator for children with T1DM, classmates, teachers, teacher's assistants, principals, administrators, cafeteria workers, coaches, gym teachers, bus drivers, and school office staff	Driscoll KA et al. (3)	3a
		Hayes - Bohn R et al. (9)	3b
		Lehmkuhl H & Nabors L (11)	3b
		Peery AI et al. (13)	3b
5.	a nurse as an organiser of the care for children with T1DM	Peery AI et al. (13)	3b

Level of Grade of Evidence (35):

2b - Therapy / Prevention, Aetiology / Harm: Individual cohort study (including low quality RCT; e.g., <80% follow-up)

- **Prognosis:** Retrospective cohort study or follow-up of untreated control patients in an RCT; Derivation of CDR" or validated on split-sample\$\$\$ only
- **Diagnosis:** Exploratory** cohort study with good" " " reference standards; CDR" after derivation, or validated only on split-sample\$\$\$ or databases
- **Differential diagnosis / symptom prevalence study:** Retrospective cohort study, or poor follow-up
- **Economic and decision analyses:** Analysis based on clinically sensible costs or alternatives; limited review(s) of the evidence, or single studies; and including multi-way sensitivity analyses

3a - Therapy / Prevention, Aetiology / Harm: SR (with homogeneity*) of case-control studies

- **Prognosis**
- **Diagnosis:** SR (with homogeneity*) of 3b and better studies
- **Differential diagnosis / symptom prevalence study:** SR (with homogeneity*) of 3b and better studies
- **Economic and decision analyses:** SR (with homogeneity*) of 3b and better studies

3b - Therapy / Prevention, Aetiology / Harm: Individual Case-Control Study

- **Prognosis**
- **Diagnosis:** Non-consecutive study; or without consistently applied reference standards
- **Differential diagnosis / symptom prevalence study:** Non-consecutive cohort study, or very limited population
- **Economic and decision analyses:** Analysis based on limited alternatives or costs, poor quality estimates of data, but including sensitivity analyses incorporating clinically sensible variations

The work of Amilltegui et al. is an observational survey study that aimed to identify the special needs of children with T1DM in the school setting from the parents' point of view and the difficulties associated with full integration experienced by their children, and to make an attempt to define interventions that can improve the situation of children requiring insulin therapy in the school setting. Among 320 schools participating in this study, 22% employed a nurse. As a result of this study, 499 questionnaires were collected. As many as 70% of parents believe that a nurse trained to take care of children with T1DM should be in school (7).

Cox et al. developed and standardised the PRISM survey (Problem Recognition in Illness Self-Management) for children and young people, exploring the barriers in self-

management experienced by children and young people with diabetes. This negative statement was an important finding: 'My child and I don't always trust the doctors and nurses.' 425 adolescents aged 13 years and older and parents of children aged 8 years and older participated in this study (8).

The work of Driscoll et al. evaluates parental perceptions of children's safety at school in the United States. Test results revealed that children in permissive states had significantly higher HbA1c (N=237, mean=8.8%+1.7; 73 mmol/mol) than those in non-permissive states (N=198, mean=8.1%+1.2; 65 mmol/mol; p<0.0001). A focus on the education of the whole school team increases the safety of children with diabetes in school when a school nurse is absent. The school nurses and non-nurse clinic assistants were most commonly reported as specifically providing help with blood glucose monitoring and insulin administration (3).

Edwards et al. created a systematic review examining eleven interventions and barriers to achieving optimal self-control by children and young people aged 3-25 years with T1DM in educational settings. That review included studies of the 55 views of children and their parents regarding the skills of school nurses (16).

Hayes-Bohn et al. conducted a study to verify opinions, concerns and recommendations related to the care of children with diabetes at school. In this study, semi-structured individual interviews were conducted, recorded, coded and qualitatively analysed. The study included 30 girls and their parents. The participants of the study recommend hiring full-time professional nurses (9).

Hellems and Clarke examined the safety of children with T1DM at school. The study involved 185 parents of children with T1DM attending 153 different schools in Virginia. Their survey study was conducted to determine whether the school staff helped students administer insulin and manage hypoglycaemia, and whether the care was performed in a safe manner. Among the parents, 69% claimed that full-time nurses were employed in schools, and 74% reported that their child with T1DM required assistance when administering insulin (10).

Kelo et al. created an overview of the findings including 22 works on self-care of school children with T1DM. In their conclusions, the authors emphasised that nurses must educate and assess a child's readiness to learn diabetes care (17).

Lehmkuhl and Nabors presented a pilot study evaluating children's perception of and satisfaction with the support from school nurses, teachers and classmates, and specifying the types of support expected by the children from each of these groups. The study examined

31 boys and 27 girls between the ages of 8 and 14 years participating in a summer camp, and their parents. The study found that children were satisfied with the support they received at school but would also like to receive it during after-school activities. Children who reported more satisfaction with school care and had lower metabolic control achieved even lower glycated haemoglobin levels after 6 months of observation. Children who reported greater dissatisfaction with their diabetic status had higher glycated haemoglobin levels after 6 months of observation (11).

Nguyen et al. formulated a research hypothesis that the supervision and monitoring of children with T1DM performed by school nurses in the field of blood glucose level monitoring and insulin dosage significantly improves glycated haemoglobin levels. Thirty-six children with T1DM with glycated haemoglobin above 9% qualified for this study and were randomised into the intervention group and the control group. The intervention group underwent a three-month intervention that involved teaching patients, their parents and school nurses the principles of insulin therapy and blood glucose measurements. Their average glycated haemoglobin value decreased by 1.6%, indicating that this intervention improved metabolic control (12).

The work of Peery et al. describes how parents and teachers of 69 children out of a total of 86 perceive nursing interventions concerning the self-management of type 1 diabetes. Parents claimed that their children follow the rules of self-management better when the nurse is present in the school, conducts diabetes education, supervises and takes care of children. Based on the findings of this study, school nurses should be responsible for organising the care of children with T1DM at school, and conduct diabetes education and counselling for children, their parents and teachers (13).

Schwartz et al. conducted a survey involving 130 school-aged patients with T1DM, their parents and school staff. Among the respondents, 76% claimed that the school nurse should be available at all times. The authors of this study claim that the number of nurses in schools is insufficient (14).

The aim of the study by Skelley et al. was to evaluate parental perspectives regarding the current state of care of children with diabetes in Alabama public schools. 170 parents of children with diabetes participated in this study. A school nurse is the only staff member that is allowed by law to administer medication independently. The parents expressed concern about the quality of care when a school nurse is not present (one nurse works in a few schools). Many parents believe that the constant presence of a nurse in school should improve the situation (15).

4 DISCUSSION

Current treatment methods for T1DM involve the administration of insulin at doses adjusted to the patient needs, require regular blood glucose monitoring and necessitate adherence to certain rules related to diet and lifestyle (27).

School and preschool activity is a very important part of the life of every child and young adult, including patients with diabetes. Children and adolescents with T1DM should regularly attend school and preschool just like other peers. This approach poses new challenges for the school environment consisting of teachers, supervisors, counsellors, caregivers, school nurses and schoolmates (3, 4).

The main responsibility of parents of sick children is to provide supervisors, teachers and a school nurse with information about the child's condition (2, 22).

Proper organisation of diabetes care in an educational setting requires training all school employees. It is necessary to accept the rules of self-monitoring and shared responsibility for the quality and organisation of care for a child with T1DM (3, 27).

A school nurse should be the person responsible for organising and conducting medical care for children with T1DM (7).

A child with type 1 diabetes requires specialised medical care, including diabetological educational nurses, diabetes educators, dietitians, pediatric diabetologists, children's endocrinologists, psychologists and social workers. The school nurse should work with members of the health care team (36).

The nursing care of children is provided in distinct manners depending on the country (7, 9-12, 16, 17, 21-23, 27).

According to Hellems and Clarke, 69% of parents in the USA state that there is a full-time nurse in the school attended by their child with T1DM (10). In contrast, the study by Amilltegui states that only 22% of schools in Spain employ full-time nurses (7).

In Slovenia, the care of a child with T1DM in school is based on the basic model of school medicine. The most appropriate work location of school nurses is partly in primary health centres and partly in schools (60.2%); the most appropriate employer is a primary health centre (59.4%) (36, 37).

Based on the majority of studies, according to parents and children, the presence of a nurse at school increases the safety of students with T1DM and facilitates improved metabolic control.

Nguyen et al. performed randomised clinical trial enrolling 36 children with T1DM who were randomised into the intervention group and the control group. They showed that teaching patients, their parents and school nurses the principles of insulin therapy and blood glucose measurements improve the metabolic control of children with T1DM. The disadvantage of this work was a small research group (12).

Type 1 diabetes affects children in different countries. The training of the school team is extremely needed, but expensive. The scope of the responsibilities of a school nurse varies in different countries. In most countries, one school nurse provides service in a few schools, limiting her or his daily availability.

Other works have researched medium- and low-value scientific evidence according to the principles of evidence-based medicine. The majority are non-randomised clinical studies, which differ in terms of the examined population. The studies were conducted in the following groups: ill children, their parents and school staff.

Children were examined in the works of Nguyen et al. (12).

In contrast, parents were examined by Amilltegui et al., Driscoll et al., Hellemis & Clarke, Schmidt et al. and Skelley et al. (3, 7, 10, 15, 32).

Children and their parents were examined by Cox et al., Hayes-Bohn et al. and Lehmkühl & Nabors (8, 9, 11).

In contrast, children, parents and school staff were examined by Peery et al. and Schwartz et al. (13, 14).

Studies examining a large population have greater value. In the presented studies, the number of participants ranged from 30 to 499 (7, 9).

The analysed studies utilised different research methods, most frequently questionnaire surveys and interviews. Therefore, it is difficult to conclusively compare the results of these studies.

Databases searches provided the following two reviews: Edwards et al. and Kelo et al. The authors of these works encountered similar difficulties. In no cases was it possible to perform a meta-analysis (16, 17).

Progress in the health, safety and education of a child with T1DM depends on the cooperation of parents, school staff (teachers), school nurses and health care team (24). Raising awareness of T1DM should be an important element of the education of all caregivers. The presence of a nurse at school helps children follow the rules of self-management and increases their safety at school. According to the surveyed children with diabetes and their parents, every school should hire a full-time, trained nurse who is aware of the children's needs.

Diabetes should not be the reason to exclude a child from any kind of preschool and school activity. Education and social acceptance of a patient with T1DM are essential in school (15).

The ability of children with T1DM to comply with the principles of self-monitoring at school is a key factor in their participation in all school activities (15).

5 CONCLUSIONS

According to parents and children with type 1 diabetes mellitus, various forms of support (i.e., checking blood glucose, giving insulin, giving glucagon, treating low and high blood glucose levels, carbohydrate counting) of school nurses are effective and should have an impact on the condition, improvement of metabolic control, school activity and safety at school.

CONFLICTS OF INTEREST

The authors declare that no conflicts of interest exist.

FUNDING

None.

ETHICAL APPROVAL

Review articles were studied.

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Priporočamo uporabo [videoposnetka z navodili za avtorje](#). Prispevke oddajte v elektronski obliki s pomočjo spletne aplikacije Editorial Manager, ki se nahaja na spletnem naslovu <http://www.editorialmanager.com/sjph/>. V uredništvo sprejemamo po pošti le še [izjave o avtorstvu in avtorskih pravicah](#), ki zahtevajo lastnoročni podpis. Prosimo, da jih pošljete hkrati z elektronsko oddajo prispevka na naslov: Nacionalni inštitut za javno zdravje, za revijo Zdravstveno varstvo, Trubarjeva 2, 1000 Ljubljana.

V spletno uredniško aplikacijo se prijavite kot 'avtor'. Prva prijava zahteva vnos podatkov o avtorju, vse naslednje prijave pa le še vnos podatkov za prijavo, ki jih na svoj elektronski naslov prejmete po prvi prijavi v sistem.

Po uspešni prijavi izpolnite vsa zahtevana strukturirana polja. 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 avtorji, da so raziskave na ljudeh oz. živalih opravljene v skladu z načeli Helsinško-Tokijske deklaracije oz. v skladu z etičnimi načeli.

Avtorji, ki v objavo pošiljate raziskovalno delo, opravljeno s pomočjo nekega podjetja, to navedite na koncu rokopisa v izjavi o financiranju.

Polje 'Comments' je namenjeno vašim dodatnim razlagam, navedete lahko tudi predlog recenzentov z imeni, nazivi, e-naslovi in zaposlitvijo.

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.

Jezik prispevka je angleščina. Objavljamo izvirne znanstvene članke, sistematične pregledne znanstvene članke, metodologije raziskav in vabljenе uvodnike. Pri izvirnih, metodoloških in sistematičnih preglednih znanstvenih prispevkih morajo biti naslov, izvleček in ključne besede prevedeni tudi v slovenščino.

Naslov, ključne besede in izvleček se oddajajo dvojezično v angleščini in slovenščini v strukturirana polja. Posebno polje za zapis v drugem jeziku obstaja le za izvleček, preostale podatke vnesite v obeh jezikih v ustrezno isto polje. 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).

Po vnosu strukturiranih podatkov oddajte še priponko - rokopis (od 1 Uvod naprej), ki ne sme zajemati podatkov, ki ste jih vnesli že pred tem v strukturirana polja, zlasti ne podatkov o avtorjih. Ime datoteke ne sme vključevati avtorjevih osebnih podatkov, prav tako ne imen ustanov, vključenih v pripravo rokopisa. Grafično in slikovno gradivo je kot ves rokopis v angleškem jeziku. Vključite ga v besedilo na mesto, kamor le-to sodi in ga opremite z naslovom. Oddate torej le en sam dokument, eno priponko. V Wordu uporabite možnost Postavitve strani/Številke vrstic (tako bo na robu vsake vrstice dokumenta dodana številka vrstice).

Pri oddaji sledite napotkom, ki vam jih ponuja sistem, pomagata pa si lahko tudi z 'Editorial Manager's Tutorial for Authors'.

Sistem najbolje deluje, če uporabljate zadnjo različico Acrobatata.

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

V nadaljevanju podajamo še nekaj natančnejših napotkov.

ROKOPIS

Besedila naj bodo napisana z urejevalnikom Word for Windows 97-2003. Robovi naj bodo široki najmanj 25 mm. Znanstveni članki naj imajo naslednja poglavja: uvod, metode, rezultati, razpravljanje in zaključek. Uvodniki in sistematični pregledni članki so lahko zasnovani drugače, vendar naj bo razdelitev na poglavja in podpoglavja jasno razvidna iz velikosti črk naslovov. Poglavja in podpoglavja naj bodo številčena dekadno po standardu SIST ISO 2145 in SIST ISO 690 (npr. 1, 1.1, 1.1.1 itd.).

DOLŽINA PRISPEVKOV

Zahtevana dolžina prispevka je za vabljen uvodnik od 250 do 1000 besed, za znanstveni članek (originalni, metodološki ali sistematični pregledni) pa od 2000 do 4500 besed s slikovnim gradivom in literaturo vred.

NASLOV IN AVTORSTVO

Naslov v angleškem in slovenskem jeziku naj bo kratek in natančen, opisen in ne trdilen (povedi v naslovih niso dopustne). Navedena naj bodo imena piscev z natančnimi akademskimi in strokovnimi naslovi ter popoln naslov ustanove, inštituta ali klinike, kjer je delo nastalo. Avtorji morajo izpolnjevati pogoje za avtorstvo. Prispevati morajo k zasnovi in oblikovanju oz. analizi in interpretaciji podatkov, rokopis morajo intelektualno zasnovati oz. ga kritično pregledati, strinjati se morajo s končno različico rokopisa. Samo zbiranje podatkov ne zadostuje za avtorstvo.

IZVLEČEK IN KLJUČNE BESEDE

Izvleček v angleškem in slovenskem jeziku naj bo pri znanstvenem in metodološkem članku strukturiran in naj ne bo daljši od 250 besed v angleščini in 400 besed v slovenščini, izvlečki ostalih člankov so lahko nestrukturirani. Izvleček naj vsebinsko povzema in ne le našteva bistvene vsebine dela. Izogibajte se kraticam in okrajšavam. Napisan naj bo v 3. osebi.

Izvleček znanstvenega članka naj povzema namen dela, osnovne metode, glavne izsledke in njihovo statistično pomembnost ter poglavitne sklepe (struktura IMRC - Introduction, Methods, Results, Conclusions).

Navedenih naj bo 3-10 ključnih besed, ki nam bodo v pomoč pri indeksiranju. Uporabljajte izraze iz MeSH - Medical Subject Headings, ki jih navaja Index Medicus.

KATEGORIJA PRISPEVKA

Kategorijo prispevka predlaga z vnosom v ustrezno polje avtor sam, končno odločitev pa sprejme urednik na osnovi predlogov recenzentov. Objavljamo izvirne znanstvene članke, metodološke članke, sistematične pregledne znanstvene članke in vabljeni uvodnike.

REFERENCE

Avtorjem priporočamo, da pregledajo objavljene članke na temo svojega rokopisa v predhodnih številkah naše revije (za obdobje zadnjih pet let).

Vsako navajanje trditve ali dognanj drugih morate podpreti z referenco. Reference naj bodo v besedilu navedene po vrstnem redu, tako kot se pojavljajo. Referenca naj bo navedena na koncu citirane trditve. Reference v besedilu, slikah in tabelah navedite v oklepaju z arabskimi številkami ((1), (2, 3), (4-7)). Reference, ki se pojavljajo samo v tabelah ali slikah, naj bodo oštevilčene tako, kot se bodo pojavile v besedilu. Kot referenc ne navajajte izvlečkov in osebnih dogovorov (slednje je lahko navedeno v besedilu). Seznam citirane literature dodajte na koncu prispevka. Literaturo citirajte po priloženih navodilih, ki so v skladu s tistimi, ki jih uporablja ameriška National Library of Medicine v Index Medicus. Uporabljajte numerično citiranje. Imena revij krajšajte tako, kot določa Index Medicus (popoln seznam na naslovu URL: <http://www.nlm.nih.gov>).

Navedite imena vseh avtorjev, v primeru, da je avtorjev šest ali več, navedite prvih šest avtorjev in dodajte et al.

Če ima članek/knjiga DOI številko, jo mora avtor navesti na koncu reference.

PRIMERI ZA CITIRANJE LITERATURE

primer za knjigo:

1. Anderson P, Baumberg P. Alcohol in Europe. London: Institute of Alcohol Studies, 2006.
2. Mahy BWJ. A dictionary of virology. 2nd ed. San Diego: Academic Press, 1997.

primer za poglavje iz knjige:

3. Urlep F. Razvoj osnovnega zdravstva v Sloveniji zadnjih 130 let. In: Švab I, Rotar-Pavlič D, editors. Družinska medicina. Ljubljana: Združenje zdravnikov družinske medicine, 2002:18-27.
4. Goldberg BW. Population-based health care. In: Taylor RB, editor. Family medicine. 5th ed. New York: Springer, 1999:32-6.

primer za članek iz revije:

5. Florez H, Pan Q, Ackermann RT, Marrero DG, Barrett-Connor E, Delahanty L, et al. Impact of lifestyle intervention and metformin on health-related quality of life: the diabetes prevention program randomized trial. J Gen Intern Med. 2012;27:1594-601. doi: 10.1007/s11606-012-2122-5.

primer za članek iz revije, kjer avtor ni znan:

6. Anon. Early drinking said to increase alcoholism risk. Globe. 1998;2:8-10.

primer za članek iz revije, kjer je avtor organizacija:

7. Women's Concerns Study Group. Raising concerns about family history of breast cancer in primary care consultations: prospective, population based study. Br Med J. 2001;322:27-8.

primer za članek iz suplementa revije z volumnom in s številko:

8. Shen HM, Zhang QF. Risk assessment of nickel carcinogenicity and occupational lung cancer. Environ Health Perspect. 1994;102(Suppl 2):275-82.
9. 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.

primer za članek iz zbornika referatov:

10. Sugden K, Kirk R, Barry HC, Hickner J, Ebell MH, Ettenhofer T, et al. Suicides and non-suicidal deaths in Slovenia: molecular genetic investigation. In: 9th European Symposium on Suicide and Suicidal Behaviour. Warwick: University of Oxford, 2002:76.

primer za magistrske naloge, doktorske disertacije in Prešernove nagrade:

11. Shaw EH. An exploration of the process of recovery from heroin dependence: doctoral thesis. Hull: University of Hull, 2011.

primer za elektronske vire:

12. EQ-5D, an instrument to describe and value health. Accessed January 24th, 2017 at: <https://euroqol.org/eq-5d-instruments/>.

TABELE

Tabele v angleškem jeziku naj bodo v besedilu prispevka na mestu, kamor sodijo. Tabele naj sestavljajo vrstice in stolpci, ki se sekajo v poljih. Tabele oštevilčite po vrstnem redu, vsaka tabela mora biti citirana v besedilu. Tabela naj bo opremljena s kratkim angleškim naslovom. V legendi naj bodo pojasnjene vse kratice, okrajšave in nestandardne enote, ki se pojavljajo v tabeli.

SLIKE

Slike morajo biti profesionalno izdelane. Pri pripravi slik upoštevajte, da gre za črno-beli tisk. Slikovno gradivo naj bo pripravljeno:

- črno-belo (ne v barvah!);
- brez polnih površin, namesto tega je treba izbrati šrafure (če gre za stolpce, t. i. tortice ali zemljevide);
- v linijskih grafih naj se posamezne linije prav tako ločijo med samo z različnim črtkanjem ali različnim označevanjem (s trikotniki, z zvezdicami...), ne pa z barvo;
- v grafih naj bo ozadje belo (tj. brez ozadja).

Črke, številke ali simboli na sliki morajo biti jasni, enotni in dovolj veliki, da so berljivi tudi na pomanjšani sliki. Ročno ali na pisalni stroj izpisano besedilo v sliki je nedopustno.

Vsaka slika mora biti navedena v besedilu. Besedilo k sliki naj vsebuje naslov slike in potrebno razlago vsebine. Slika naj bo razumljiva tudi brez branja ostalega besedila. Pojasniti morate vse okrajšave v sliki. Uporaba okrajšav v besedilu k sliki je nedopustna. Besedila k slikam naj bodo napisana na mestu pojavljanja v besedilu.

Fotografijam, na katerih se lahko prepozna identiteta bolnika, priložite pisno dovoljenje bolnika.

MERSKE ENOTE

Naj bodo v skladu z mednarodnim sistemom enot (SI).

KRATICE IN OKRAJŠAVE

Kraticam in okrajšavam se izogibajte, izjema so mednarodno veljavne oznake merskih enot. V naslovih in izvlečku naj ne bo kratic. 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.

UREDNIŠKO DELO

Prispelo gradivo z javnozdravstveno tematiko mednarodnega pomena posreduje uredništvo po tehnični brezhibnosti v strokovno recenzijo trem mednarodno priznanim strokovnjakom. Recenzijski postopek je dvojno slep. Po končanem uredniškem delu vrnemo prispevek korespondenčnemu avtorju, da popravke odobri in upošteva. Popravljen čistopis vrne v uredništvo po spletni aplikaciji Editorial Manager. Uredništvo dopušča obravnavo največ treh revizij. Če tretja revizija rokopisa ne upošteva vseh pripomb recenzentov, se rokopis umakne iz uredniškega postopka. Sledi jezikovna lektura, katere stroške krije založnik. Med redakcijskim postopkom je zagotovljena tajnost vsebine prispevka. Avtor dobi v pogled tudi prve, t. i. krtačne odtise, vendar na tej stopnji upoštevamo samo še popravke tiskarskih napak. Krtačne odtise je treba 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 članek odstranjen iz postopka.

Morebitne pritožbe avtorjev obravnava uredniški odbor revije.

Za objavo članka prenese avtor avtorske pravice na Nacionalni inštitut za javno zdravje kot založnika revije (podpiše Pogodbo o avtorstvu in avtorskih pravicah). Kršenje avtorskih in drugih sorodnih pravic je kaznivo.

Prispevkov ne honoriramo in tudi ne zaračunavamo stroškov uredniškega postopka.

Avtor dobi izvod tiskane revije, v kateri je objavljen njegov članek.