

HEALTH-RELATED QUALITY OF LIFE IN CHILDREN AND ADOLESCENTS WITH CEREBRAL PALSY

Z ZDRAVJEM POVEZANA KAKOVOST ŽIVLJENJA OTROK IN NAJSTNIKOV S CEREBRALNO PARALIZO

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ABSTRACT

Keywords:
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proxy-reports

Introduction. In a cross-sectional cohort study, health-related quality of life of Slovenian children and adolescents with cerebral palsy was examined, and factors associated with it have been identified.

Methods. Caregivers of 122 children and adolescents with cerebral palsy were addressed to fill out proxy versions of HRQoL questionnaires (DISABKIDS generic and cerebral palsy module). Children and adolescents without cognitive deficit were asked to fill out the self-report versions.

Results. Ninety-one families of 43 children (the mean age is 10 years, 6 months, SD 1.2; 26 males and 17 females) and 48 adolescents (the mean age is 14 years, SD 0.9; 23 males and 25 females) completed proxy-reports. Forty-eight individuals were able to self-report (26 children and 22 adolescents). Health-related quality of life was perceived as good. Self-reporting participants scored higher than their caregivers (mean score 75.6, SD 15.9 versus mean 72.3, SD 17.9; $p=0.048$). Adolescents scored lower than children in all domains (mean score 69.4, SD 19.4 versus mean 80.8, SD 10.0; $p=0.01$). Higher age ($p<0.001$), pain ($p<0.001$) and disturbed sleep ($p=0.002$) were strong predictors of worse health-related quality of life. Social Inclusion and Independence domains received the lowest scores.

Conclusions. Slovenian children and adolescents with cerebral palsy have a good health-related quality of life, with Social Inclusion and Independence being the weakest domains. Children reported higher scores than adolescents or their caretakers. Pain was the strongest predictor of poor health-related quality of life.

IZVLEČEK

Ključne besede:
cerebralna paraliza,
otroci, najstniki,
kakovost življenja

Uvod. V luči vse večjega trenda k celostnemu pristopu obravnave otrok s cerebralno paralizo se poleg dobrega poznavanja in vrednotenja otrokove oviranosti med glavna orodja, ki so v pomoč pri načrtovanju obravnave, uvrščajo vprašalniki za oceno z zdravjem povezane kakovosti življenja. Cilja raziskave sta bila pridobiti vpogled v z zdravjem povezano kakovost življenja pri skupini slovenskih otrok s cerebralno paralizo in najti morebitne povezave z njihovimi demografskimi in kliničnimi podatki.

Metode. V okviru presečne kohortne raziskave je bilo iz Slovenskega registra otrok s cerebralno paralizo naključno izbranih 122 družin. Skrbniki otrok so bili pozvani k sodelovanju z izpolnitvijo proxy različice vprašalnika o z zdravjem povezani kakovosti življenja. Otroci brez kognitivne okvare so bili naprošeni, naj izpolnijo različico vprašalnika, namenjeno samoocenjevanju.

Rezultati. Pri oceni z zdravjem povezane kakovosti življenja je sodelovalo 91 družin. Skrbniki 43 otrok in 48 najstnikov so izpolnili svoje različice vprašalnikov (proxy različica). Osemindeset otrok in najstnikov brez kognitivne okvare je samih izpolnilo vprašalnik (self različica). Ocenjena z zdravjem povezana kakovost življenja je bila dobra. Otroci so jo ocenili boljše kot najstniki (povprečno 80,8, SD 10,0 proti povprečno 69,4, SD 19,4; $p=0,01$). Preiskovanci so jo ocenili boljše kot njihovi skrbniki (povprečno 75,6, SD 15,9 proti povprečno 72,3, SD 17,9; $p=0,048$). Višja starost ($p<0,001$), prisotnost bolečine ($p<0,001$) in motnje spanja ($p=0,002$) so bili močni napovedni dejavniki za slabšo z zdravjem povezano kakovost življenja. Socialna vključenost in samostojnost sta bili najslabše ocenjeni domeni. Vprašalnik DISABKIDS se je izkazal za dobro orodje za oceno z zdravjem povezane kakovosti življenja otrok s cerebralno paralizo.

Sklep. Slovenski otroci s cerebralno paralizo ocenjujejo svojo z zdravjem povezano kakovost življenja kot dobro. Otroci jo ocenjujejo boljše kot najstniki ali njihovi skrbniki. Bolečina je najmočnejši napovedni dejavnik slabše z zdravjem povezane kakovosti življenja.

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1 INTRODUCTION

Cerebral palsy (CP) is a diverse condition with various levels of reduced motor function, often accompanied with cognitive deficit, epilepsy, vision or hearing impairment, orogastrintestinal malfunction and skeletal problems (1). All CP definitions share the fact that the injury to the immature brain results in a life-long disability (2-4). Current therapeutic interventions, focused on alleviating physical dysfunctions, can only offer limited relief and can cause additional pain (4, 5). Psychological problems and needs of CP patients are much less obvious and are usually poorly understood and tended by healthcare practitioners. Evidence shows that CP patients do not primarily search for physical improvement as much as they crave for social inclusion (5, 6).

QoL is a broad concept defined by the World Health Organization as "individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" (7). Health-Related Quality of Life (HRQoL) represents the QoL in the view of an individual's health status (8). When managing chronic conditions, such as CP, it is an important marker of the efficacy of clinical interventions. It is, however, a complex, hard-to-define term and controversies exist about its detailed definition and appropriate measuring tools (8).

Studies that examined HRQoL of children and adolescents with CP showed scores similar to aged-matched general population with the exceptions in social participation and motor functioning (5, 6, 9, 10). In longitudinal studies, HRQoL in childhood correlated well with HRQoL in adolescence (5). Pain, parenting stress and psychological problems were identified as predictors of worse HRQoL (5, 10, 11). Although motor impairment influenced functioning and participation, it affected psychosocial wellbeing to a much lesser extent (9).

Not all existing HRQoL measuring tools actually measure HRQoL (a subjective perspective), but rather an objective interaction between body structure, function and participation (12). The weakness of many HRQoL measures is the lack of indicators that measure wellbeing (positive emotions and satisfaction about daily activities, relations and life overall), while being oriented towards asking how often patients feel sad and unsatisfied with their involvement in daily tasks (13).

We chose DISABKIDS questionnaires for their recognition as good HRQoL measuring tools (12). Generic and various disease specific modules enable a comparison between children with different chronic conditions (14, 15). A good correlation with KIDSCREEN measures (developed by the same group of professionals) offers an opportunity for comparing QoL of aged-matched general population. DISABKIDS questionnaires show good linkage with the International Classification of Functioning, Disability and Health (ICF) (16).

The objective of our study was to assess HRQoL of Slovenian paediatric patients with CP, identify possible underlying factors that are associated with it, and find potential differences in scoring between caregivers and children.

2 METHODS

2.1 Participants

At the time of data collection in July 2014, the Slovenian National Cerebral Palsy Registry (SRCP) included 371 children of all ages. They were registered through neurodevelopmental paediatricians in regional outpatient clinics covering around 90% of Slovenian paediatric CP population. Out of original 150 children aged 8-16 years, randomly selected from the SRCP, contact data for 122 families were available; 91 caregivers (of 43 children aged 6-12 years and 48 adolescents aged 13-16 years) were willing to cooperate. Children with tested IQ score >70 or attending regular school were considered cognitively able to self-report, and 48 of them (26 children and 22 adolescents) agreed to do so.

2.2 The Procedure

The caregivers of 122 children with CP were contacted by telephone at one or (in the case of first call non-responders) at two occasions by a single physician. Study aims were explained to them and caregivers were invited to participate. Questionnaires were sent to 103 caregivers who accepted the invitation, together with written instructions and informed consent form.

2.3 Measures

DISABKIDS instruments were used to assess HRQoL. DISABKIDS Chronic Generic Measure - long version (DCGM-37) - contains 3 domains (Mental, Social and Physical) that

are further divided in order to measure the following 6 dimensions: Independence, Emotion, Social inclusion, Social exclusion, Limitation, and Treatment. All items are Likert-scaled and transformed to a scale from 0 to 100, where higher scores indicate a better HRQoL. According to field testing, the instrument shows sound psychometric properties with satisfactory reliability, construct validity, convergent and discriminant validity (15). It is available in self-reported and proxy versions, and it was designed for children aged 8-16 years. DISABKIDS Cerebral Palsy Module (DCSM-CPM) and DISABKIDS Epilepsy Module (DCSM-EM) both address two dimensions, namely: Impact (10 items) and Communication (2 items) for DCSM-CPM, and Impact and Social (both 5 items) for DCSM-EM.

All six questionnaires (self-reported and proxy versions) underwent the translation and validation procedure with the guidance of European DISABKIDS Group and DISABKIDS manual, and were approved for the use in the study (17). Paediatric Quality of Life Inventory 4.0 (PedsQL) Generic Core Scales was used for comparison, as it has already been validated in the Slovenian language. Its concept is very similar to DCGM-37 and consists of 23 items encompassing: Physical functioning, Emotional functioning, Social functioning and School functioning (18).

The assessment bundle included: DCGM-37, DCSM-CPM, DCSM-EM (in cases of comorbid epilepsy) and PedsQL. In order to gain information about clinical usefulness of selected HRQoL measures, we added 5 additional questions asking for personal opinion about the questionnaires. All questionnaires were sent in proxy versions and, if applicable, in self-reported versions.

2.4 Statistical Analyses

Items from all questionnaires were scored according to DISABKIDS manual (17). Raw scores were converted into values on a 0-100 scale. A score was calculated if at least 80% of items were answered. Overall scores were calculated as a sum of all separate scores. Each score was expressed as mean and standard deviation (SD).

The effect of various factors on different dimensions and the final score was evaluated by independent samples t-test or one-way ANOVA, as the distribution of results was close to normal. Linear regression model was constructed to determine the most important factors influencing HRQoL. The differences were expressed as mean difference and 95% confidence interval (CI). A value

of $p < 0.05$ was considered statistically significant.

The partial and final scores of self-reports and proxy-reports were compared using Pearson's Product Moment Correlation coefficient (Pearson's r).

The partial and final scores of self-reports and proxy-reports were also compared to subscales and the total score of PedsQL measure, where Pearson's r was used again.

All the analyses were conducted with the SPSS (Statistical Package for Social Sciences Program) version 20.0.

3 RESULTS

Out of 122 parents of children with CP invited to partake in the study, 91 were willing to participate (the response rate was 75%). The main reason for refusal came from parents of children with very mild disability, as they considered their children healthy (not having cerebral palsy) and were concerned that the questionnaire would disturb them. In the initial sample, there were 60 families with cognitively intact children, among which 48 were willing to self-report (the response rate was 80%). The remaining 43 families with more severely affected children filled out only the proxy-reports. DISABKIDS final scores (transformed to a scale of 1-100) by different modules, items and demographic properties are presented in Table 1.

Table 1. DISABKIDS final scores (transformed to a scale of 1-100) by different modules, items and demographic properties.

SELF - REPORTS		ALL		CHILDREN		ADOLESCENTS		MALES		FEMALES	
Transformed scores (0-100; mean, SD)		valid items	score	valid items	score	valid items	score	valid items	score	valid items	score
DCGM-37-S	Independence	48	70.4,SD 20.1	26	75.6,SD 15.7	22	64.2,SD 23.1	23	69.4,SD 22.8	25	71.3,SD 17.6
	Physical	48	74.6,SD 18.9	26	80.3,SD 11.9	22	68.0,SD 23.5	23	74.5,SD 21.2	25	76.9,SD 12.9
	Emotion	48	85.3,SD 17.7	26	91.1,SD 9.8	22	78.6,SD 22.4	23	85.2,SD 20.5	25	71.5,SD 34.9
	Exclusion	48	80.2,SD 17.0	26	84.9,SD 10.5	22	74.6,SD 21.3	23	78.3,SD 17.7	25	69.5,SD 16.2
	Inclusion	48	65.7,SD 19.5	26	70.4,SD 16.9	22	60.2,SD 21.3	23	61.6,SD 22.2	25	82.0,SD 16.5
	Medication	14	78.6,SD 26.8	7	83.2,SD 12.4	7	74.0,SD 36.9	9	82.5,SD 22.6	5	85.4,SD 15.3
	General	48	75.6,SD 16.0	26	80.8,SD 10.0	22	69.4,SD 19.5	23	74.2,SD 19.0	25	74.8,SD 17.2
DCSM-CPM-S	Impact	44	76.1,SD 15.0	23	79.3,SD 10.4	21	72.6,SD 18.4	20	74.5,SD 18.3	24	77.5,SD 11.8
	Communication	44	92.3,SD 20.6	23	98.9,SD 3.6	21	85.1,SD 28.1	20	90.0,SD 25.2	24	94.3,SD 16.1
	Total	44	78.8,SD 14.7	23	82.6,SD 8.7	21	74.7,SD 18.7	20	77.1,SD 18.7	24	80.3,SD 10.6
PROXY - REPORTS		ALL		CHILDREN		ADOLESCENTS		MALES		FEMALES	
Transformed scores (0-100; mean, SD)		valid items	score	valid items	score	valid items	score	valid items	score	valid items	score
DCGM-37-S	Independence	83	58.1,SD 24.4	37	67.8,SD 20.8	46	50.3,SD 24.5	50	54.8,SD 24.6	33	63.1,SD 23.7
	Physical	83	66.2,SD 21.2	37	71.2,SD 17.1	46	62.1,SD 23.3	50	63.38,SD 22.5	33	70.4,SD 17.7
	Emotion	80	78.3,SD 20.4	36	82.7,SD 16.8	45	74.7,SD 22.5	47	77.9,SD 22.5	33	78.9,SD 17.3
	Exclusion	82	76.5,SD 19.9	36	82.5,SD 13.7	46	71.7,SD 22.8	49	73.6,SD 21.9	33	80.8,SD 15.8
	Inclusion	83	53.2,SD 24.5	36	65.2,SD 19.2	47	44.0,SD 24.3	49	49.9,SD 24.8	34	58.0,SD 23.7
	Medication	34	79.8,SD 21.0	15	79.8,SD 24.8	19	79.8,SD 18.3	23	78.7,SD 21.7	11	82.1,SD 20.5
	General	82	66.9,SD 18.2	36	75.1,SD 12.5	46	60.5,SD 19.5	49	64.8,SD 19.2	33	70.1,SD 16.3
DCSM-CPM-S	Impact	72	71.0,SD 17.3	33	74.5,SD 15.6	39	68.1,SD 18.3	20	72.1,SD 16.0	22	76.9,SD 11.1
	Communication	74	78.0,SD 29.2	33	87.9,SD 21.9	41	70.1,SD 32.0	20	88.1,SD 24.5	24	95.8,SD 12.6
	Total	74	72.6,SD 16.9	33	76.8,SD 13.6	41	69.2,SD 18.6	20	74.8,SD 14.9	24	80.9,SD 9.3

Abbreviations: DISABKIDS Chronic Generic Measure Self / Proxy (DCGM-37-S/-P); DISABKIDS Condition Specific Module - Cerebral Palsy Module Self / Proxy (DCSM-CPM-S/-P)

3.1 Sample Characteristics

The mean age of all participants with CP was 12 years and 4 months (SD 2.02); 43 (48%) were children (the mean age is 10 years, 6 months, SD 1.2) and 48 (53%) adolescents (the mean age is 14 years, SD 0.9). The sample consisted of 53 (58%) males and 38 (42%) females.

Among 48 self-reporting participants, there were 26 (54%) children (the mean age is 10 years 8 months, SD 1.1) and 22 (46%) adolescents (the mean age is 13 years, 11 months, SD 0.8). Gender distribution across the self-reported sample was balanced with 23 (48%) males and 25 (52%) females.

Compared to the data in the SRCP registry, the study sample shows similar gender, CP type and GMFCS distribution, and was therefore found to be representative of the population of Slovenian paediatric patients with CP (19).

All characteristics of children concerning their demographic parameters, level of impairment, comorbidities, therapeutic interventions and family social status are listed in Table 2 and Table 3.

Table 2. Demographic and health-related data of 91 participants.

	All participants - proxy reports			Self-reported participants		
	Children (8-12 y) N 43 (47.3%)	Adolesc. (13-17 y) N 48 (52.7%)	All N 91	Children (8-12 y) N 26 (54.2%)	Adolesc. (13-17 y) N 22 (45.8%)	All N 48
Age (mean)	10 y 6 mo, SD 1.2	14 y, SD 0.9	12 y 4 mo, SD 2.02	10 y 8 mo, SD 1.1	13 y 11mo, SD 0.8	12 y 2 mo, SD 1.9
Gender						
male	26 (23.3%)	27 (56.3%)	53 (58.2%)	13 (50.0%)	10 (45.5%)	23 (47.9%)
female	17 (39.5%)	21 (43.8%)	38 (41.8%)	13 (50.0%)	12 (54.5%)	25 (52.1%)
CP classification						
spastic	35 (81.4%) uni 14 (33%)	43 (89.6%) uni 11 (23%)	78 (85.7%) uni 25 (27%)	24 (92.3%) uni 13 (50%)	22 (100%) uni 7 (32%)	46 (95.8%) uni 20 (42%)
dyskinetic dystonia	7 (16.3%)	4 (8.3%)	11 (12.1%)	2 (7.6%)	/	2 (4.2%)
dys.choreoathetosis	/	1 (2.1%)	1 (1.1%)	/	/	/
ataxic	1 (2.3%)	/	1 (1.1%)	/	/	/
GMFCS						
I	18 (41.9%)	11 (22.9%)	29 (31.9%)	16 (61.5%)	8 (36.4%)	24 (50%)
II	10 (23.2%)	10 (20.8%)	20 (22.0%)	7 (26.9%)	7 (31.8%)	14 (29.2%)
III	3 (7.0%)	8 (16.7%)	11 (12.1%)	1 (3.8%)	4 (18.2%)	5 (10.4%)
IV	7 (16.3%)	8 (16.7%)	15 (16.5%)	2 (7.7%)	3 (13.6%)	5 (10.4%)
V	5 (11.6%)	11 (22.9%)	16 (17.6%)	/	/	/
IQ						
> 70	25 (58.1%)	21 (43.8%)	48 (52.7%)	26 (100%)	22 (100%)	48 (100%)
50-70	7 (16.3%)	10 (20.8%)	15 (16.5%)	/	/	/
20-50	7 (16.3%)	11 (22.9%)	18 (19.8%)	/	/	/
< 20	4 (9.3%)	6 (12.5%)	10 (11.0%)	/	/	/
Epilepsy	15 (34.9%)	17 (35.4%)	32 (35.2%)	3 (11.5%)	3 (13.6%)	6 (12.5%)
Speech disorder	19 (44.2%)	22 (45.8%)	41 (45.1%)	7 (26.9%)	6 (27.3%)	13 (27.1%)
Attention disorder	14 (32.6%)	11 (22.9%)	25 (27.5%)	10 (38.5%)	5 (22.7%)	15 (31.3%)
Visual impairment	15 (34.9%)	19 (39.6%)	34 (37.4%)	7 (26.9%)	9 (40.9%)	16 (33.3%)
- severe	2 (4.7%)	2 (4.2%)	4 (4.4%)	1 (3.8%)	/	1 (2.1%)
Hearing impairment	4 (9.3%)	3 (6.3%)	7 (7.7%)	1 (3.8%)	1 (4.5%)	2 (4.2%)
- severe	2 (4.7%)	1 (2.1%)	3 (3.3%)	1 (3.8%)	1 (4.5%)	2 (4.2%)
Reporting pain	7 (16.3%)	14 (29.2%)	21 (23.1%)	2 (7.7%)	5 (22.7%)	7 (14.6%)
Disrupted sleep	8 (18.6%)	12 (25.0%)	20 (22.0%)	2 (7.7%)	1 (4.5%)	3 (6.3%)
Gastrostomy	1 (2.3%)	/	1 (1.1%)	/	/	/
Reduced bone density	4 (9.3%)	5 (10.4%)	9 (10.0%)	/	/	/

Abbreviations: the number of cases (N); years (y); months (mo); unilateral (uni); Gross Motor Function Classification Scale (GMFCS); intelligence quotient (IQ)

Table 3. Implemented interventions and socio-economic data of 91 participants.

	All participants - proxy reports									Self-reported participants																																												
	Children (8-12 y) N 43 (47.3%)			Adolesc. (13-17 y) N 48 (52.7%)			All N 91			Children (8-12 y) N 26 (54.2%)			Adolesc. (13-17 y) N 22 (45.8%)			All N 48																																						
Interventions:	3.9 per person (min 1, max 11)									/	/	/	/	/	/	/	/	/																																				
Neurodevelopmental th.	91 (100%)									/	/	/	/	/	/	/	/	/																																				
- age at onset	65 (71%) < 6 months, 77 (85%) < 12 months									/	/	/	/	/	/	/	/	/																																				
Physiotherapy	69 (75.8%)									/	/	/	/	/	/	/	/	/																																				
Occupational therapy	48 (52.7%)									/	/	/	/	/	/	/	/	/																																				
Speech-language therapy	31 (43.1%)									/	/	/	/	/	/	/	/	/																																				
Special pedagogy	25 (27.5%)									/	/	/	/	/	/	/	/	/																																				
Hypo therapy	20 (21.9%)									/	/	/	/	/	/	/	/	/																																				
Hydrotherapy	17 (18.7%)									/	/	/	/	/	/	/	/	/																																				
Psychological therapy	11 (12.1%)									/	/	/	/	/	/	/	/	/																																				
Social pedagogy	9 (9.8%)									/	/	/	/	/	/	/	/	/																																				
Complementary methods	7 (7.7%)									/	/	/	/	/	/	/	/	/																																				
Orthopedic therapy	3 (3.3%)									/	/	/	/	/	/	/	/	/																																				
Typhlopädagogie	2 (2.2%)									/	/	/	/	/	/	/	/	/																																				
Surdopädagogie	2 (2.2%)									/	/	/	/	/	/	/	/	/																																				
Education (stage):	no data	1	2	3	4	5	6	7	8	no data	1	2	3	4	5	6	7	8																																				
- mother (N)	12	1	3	6	28	13	10	17	1	9	0	1	3	14	7	3	11	0																																				
(%)	13	1	3	7	31	14	11	19	1	19	0	2	6	29	15	6	23	0																																				
- father (N)	13	0	5	9	30	16	4	13	1	8	0	2	5	14	11	1	7	0																																				
(%)	14	0	6	10	33	18	4	14	1	17	0	4	10	29	23	2	15	0																																				
Unemployment:																																																						
- mother	13 (30.2%)									20 (41.7%)									33 (36.3%)									7 (26.9%)									6 (27.3%)									13 (27.1%)								
- mother (part time)	6 (14.0%)									2 (4.2%)									8 (8.8%)									2 (7.7%)									1 (4.5%)									3 (6.3%)								
- father	4 (9.3%)									5 (10.4%)									9 (9.9%)									/									1 (4.5%)									1 (2.1%)								
- both	2 (4.7%)									3 (6.3%)									5 (5.5%)									/									1 (4.5%)									1 (2.1%)								
Financial support																																																						
- lost income substitute	8 (18.6%)									20 (41.7%)									28 (30.8%)									1 (3.8%)									5 (22.7%)									6 (12.5%)								
- child care support	25 (58.1%)									36 (75.0%)									61 (67.0%)									10 (38.5%)									11 (50.0%)									21 (43.8%)								
Child residence																																																						
- home	41 (95.3%)									45 (93.8%)									86 (94.5%)									26 (100%)									22 (100%)									48 (100%)								
- day care centre	1 (2.3%)									1 (2.1%)									2 (2.2%)									/									/									/								
- 24h centre	1 (2.3%)									2 (4.2%)									3 (3.3%)									/									/									/								
Schooling:																																																						
- regular	25 (58.1%)									22 (45.8%)									47 (51.6%)									25 (96.2%)									22 (100%)									47 (97.9%)								
- adjusted program	18 (41.9%)									26 (54.2%)									44 (48.4%)									1 (3.8%)									/									1 (2.1%)								

Abbreviations: the number of cases (N); years (y)

3.2 Proxy-Reports

Caregivers rated their children's HRQoL as 'good' (DCGM-37 mean total transformed score 66.9, SD 18.2). The worse scored domains were Social Inclusion (mean 53.2, SD 24.5) and Independence (mean 58.1, SD 24.4). The highest rated were Emotion (mean 78.3, SD 20.4) and Medication (mean 79.8, SD 21.0). HRQoL of children was scored higher than HRQoL of adolescents (mean 75.1, SD 12.5 versus mean 60.5, SD 19.5; mean difference 14.64, 95% CI 7.21 - 22.07; $p < 0.001$). The largest differences were for Independence (mean 67.79, SD 20.84 versus 50.34, SD 24.54; mean difference 17.45, 95% CI 7.36 - 27.54; $p = 0.001$), Social Inclusion (mean 65.23, SD 19.17 versus 44.02, SD 24.34; mean difference 21.21, 95% CI 11.40 - 31.02; $p < 0.001$) and Social Exclusion domains (mean 82.52, SD 13.65 versus 71.74, SD 22.76; mean difference 10.78, 95% CI 2.23 - 19.34; $p = 0.014$). There were some missing data for each item, and 5 items had a missing data rate equal to 10% or more. In nine questionnaires, scoring was not possible due to too many missing values (>20% of unanswered items).

Seventy-nine DCSM-CPM completed proxy reports with a mean total transformed score 72.6, SD 16.9. The subscale Communication (mean 78.0, SD 29.2) was scored higher than Impact (mean 71.0, SD 17.3). Caregivers of adolescents scored lower (mean 69.2, SD 18.6) compared to caregivers of children (mean 76.8, SD 13.6), but the difference was borderline statistically important ($p = 0.050$).

Nineteen DCSM-EM proxy reports were valid and gave the total transformed score of mean 89.3, SD 14.3.

3.3 Self-Reports

Among DCGM-37 self-reporters, HRQoL was perceived as 'good' (the mean total transformed score is 75.6, SD 15.9). The worse scored subscales were, as in proxy-reports, Social inclusion (mean 65.7, SD 19.5) and Independence (mean 70.4, SD 20.1). The highest score was given to the sub-scale Emotion (mean 85.3, SD 17.7). Children rated their HRQoL better than adolescents (mean 80.8, SD 10.0 versus mean 69.4, SD 19.4; mean difference 11.37, 95% CI 2.57 - 20.17; $p = 0.01$). Between subscales, the biggest difference was seen in Emotion (mean 91.07, SD 9.76 versus mean 78.57, SD 22.43; mean difference 11.37, 95% CI 2.57 - 20.17, $p = 0.01$), Physical (mean 80.29, SD 11.82 versus mean 67.99, SD 23.48; mean difference 12.30, 95% CI 1.74 - 22.85, $p = 0.02$) and Social exclusion domains (mean 84.94, SD 10.54 versus mean 74.62, SD 21.28; mean difference 10.31, 95% CI 0.78 - 19.84; $p = 0.035$). There were no missed items in the sample.

Twenty-three children and 21 adolescents filled out DCSM-CPM self-reports. The mean transformed total score of all 44 reports was 78.8, SD 14.7. The Communication

domain scored higher (92.3, SD 20.6) than Impact (76.1, SD 15.0). No differences were observed among children and adolescents in DCSM-CPM reports ($p = 0.14$).

Only 6 children and adolescents able to self-report had concomitant epilepsy. They scored their HRQoL through DCSM-EM as very good (80.4, SD 24.1).

3.4 Proxy and Self-Reports Comparison

The correlation between DCGM-37 proxy and self-reports was good (Pearson $r = 0.80$ for total scores and $r = 0.59 - 0.80$ for separate domains, where only Social Inclusion and Social Exclusion domains resulted in $r < 0.70$). The absolute difference between proxy and self-reported scores was significant, self-reporting participants rating their HRQoL higher than caregivers (mean 75.6, SD 15.9 versus mean 72.3, SD 17.9; the mean difference 3.23, 95% CI 0.03 - 6.43; $p = 0.048$).

The same was found for DCSM-CPM measure with the total transformed score $r = 0.76$ and $r = 0.73$ and $r = 0.81$ for Impact and Communication subscales. There was no difference between proxy and self-reported DCSM-CPM scores ($p = 0.97$).

3.5 PedsQL Reports

The mean total score of 78 PedsQL - proxy measures - was 61.5, SD 21.4, and of 41 PedsQL self-reported measures 75.6, SD 19.6. The correlation between DISABKIDS and PedsQL total transformed scores was very good (Pearson $r = 0.81$ for self-reports and $r = 0.86$ for proxy reports). Domains measuring similar concepts showed high correlation as well: $r = 0.70$ for physical domains (self) and $r = 0.81$ for physical domains (proxy), $r = 0.74$ for emotional domains (self) and $r = 0.64$ for emotional domains (proxy) and $r = 0.75$ for social domains (self) and $r = 0.80$ social domains (proxy).

3.6 Factors Influencing HRQoL

DCGM-37 proxy reports: lower age was found a strong single predictor of better HRQoL (mean 75.1, SD 12.5 versus mean 60.5, SD 19.5; the mean difference 14.64, 95% CI 7.21 - 22.07; $p < 0.001$). There was a negative correlation between HRQoL and disease severity. GMFCS level alone, tested with one-way ANOVA, was negatively associated with HRQoL ($p = 0.023$). So were pain (the mean difference 23.21, 95% CI 14.71 - 31.72; $p < 0.001$), disturbed sleep (the mean difference 17.96, 95% CI 8.88 - 27.05; $p = 0.001$) and cognitive abilities (the mean difference 13.38, 95% CI 5.84 - 20.93; $p = 0.001$). However, the multivariable analysis of the same variables showed that the main factors reducing HRQoL were pain ($p < 0.001$) and disturbed sleep ($p = 0.002$), and not GMFCS itself ($p = 0.735$). Adjusted r score for this model was 0.49

and the strongest standardised regression coefficient was found for pain -0.47 , $p < 0.001$. No correlation was found between the number of implemented therapeutic interventions and HRQoL, nor for comorbidities, such as epilepsy, and language, speech and attention disorders. There was also no HRQoL association with parents' education, employment status, financial support, child cognitive abilities and schooling type.

DCGM-37 self-reports: in the single variable analysis, besides higher age (the mean difference 11.37 , 95% CI $2.57 - 20.17$; $p = 0.012$), the main factors reducing HRQoL were pain (the mean difference 18.57 , 95% CI $6.03 - 31.11$; $p = 0.005$) and comorbidities (the mean difference 9.56 , 95% CI $0.24 - 18.88$; $p = 0.045$). In the multivariable model using these variables, the adjusted r score was 0.27 , and the strongest standardised regression coefficient was found for pain (-0.39 , $p = 0.009$), whereas age was only borderline significant ($p = 0.059$).

DSCM-CPM proxy reports: in the multivariable model using variables that tested significant in univariate models (pain, disturbed sleep, GMFCS, cognitive impairment, speech impairment and epilepsy), pain was the only factor negatively influencing HRQoL (adjusted r score 0.34 , standardized regression coefficient -0.30 , $p = 0.009$). DCSM-CPM self-reports: pain was the only significant single factor related to a lower perception of HRQoL ($p = 0.027$).

3.7 Additional Questions

The caregivers needed, on average, 13.6 minutes to fill out DCGM-37 and DCSM-CPM proxy modules. Forty-six caregivers (54%) thought they were useful and 40 (47%) interesting. Eighty-three (87%) would potentially fill them out again, 50 (58%) would do that gladly.

The self-reported children and adolescents needed, on average, 14.5 minutes to fill out both questionnaires. Twenty-one (48%) of them found the questionnaires interesting and 16 (36%) useful. Only 3 participants (7%) considered the questionnaires stupid. The items made 2 participants (5%) feel uncomfortable, 12 (27%) felt a bit embarrassed, but were not bothered by them, and 30 (68%) were not bothered by them not at all. Forty-one (93%) individuals would potentially fill out the questionnaires again, 20 (45%) would do that gladly.

4 DISCUSSION

This is the first study that assessed HRQoL of Slovenian children and adolescents with CP. Overall, their self- and proxy reported HRQoL is good, which is similar to the findings in studies evaluating similar patient populations in other countries ($5, 10, 11, 18$).

Recently published data about HRQoL in children and adolescents with CP (SPARCLE I and II studies) convincingly show scores similar to the general age-matched population, with the exception of social support and peers domains (5). In these studies, HRQoL of children was a good predictor of HRQoL later in adolescence (5). In the present study, we compared HRQoL of children and adolescents in cross-sectional cohorts simultaneously and with the same HRQoL tool. We found significantly lower HRQoL scores in adolescents, as compared to those in children. QoL issues tend to change over time, as independence, relationships, sexuality and acceptance of disability increasingly gain importance in adolescence (20). This could potentially explain lower self- and proxy-perceived HRQoL scores in adolescents. However, our sample of self-reporting participants was small, and we did not include a control group of healthy children.

Pain is a well-recognised predictor of decreased participation and poor HRQoL ($5, 10, 11, 21$). In our study, it was related to lower scores in all groups. Disturbed sleep negatively associated with proxy-reported HRQoL, but it was a rare complaint with no impact in the self-reporting group. Our study was unable to show the impact of therapeutic interventions on HRQoL. This could be explained by a well-organized Slovenian neurodevelopmental network that enables all children with developmental delay to start a specific neurodevelopmental treatment at an early age, most of them within the first 6 months of life (19). Whereas most interventions aim to improve physical independence, most have a limited effect on HRQoL. It is therefore very important to design accessible interdisciplinary therapeutic approaches, which would better address HRQoL issues.

Children and adolescents rated their HRQoL higher than their caregivers in all domains, which is similar to the findings of other studies ($11, 22$). One reason for that could be that children focus on their abilities, as their disability has always been a part of their functioning, while caregivers tend to compare the abilities of their children to those of healthy children (23). Regardless of their level of disability, almost all children in our study resided at home, which indicates a high level of family engagement. It is possible that lower proxy scores reflect caregivers' psychological burden. It has been recognized that caregivers' well-being is significantly impaired, compared to matched adults from the general population (24). No proper supportive family-centred services or parent networks currently exist in Slovenia. Surprisingly, despite various unfavourable socio-economic factors, such as high maternal unemployment rate, none of them were significantly associated with HRQoL (20).

Consistent with other studies, there were limitations regarding Social Inclusion and Independence, which are, to some extent, expected due to the nature of the disease (5, 9). Whereas most interventions aim to improve physical independence, a lot more could be done in the wider society to improve social inclusion of children with CP.

This study has some limitations: The number of patients in subgroups was relatively small, there was no comparative sample of healthy children and adolescents, a non-personal approach was used, and a generic questionnaire was selected as a primary assessment tool.

5 CONCLUSIONS

This was the first study to assess HRQoL of children with CP in Slovenia. It is important to follow HRQoL of CP patients closely throughout their childhood and adolescence, and pay attention to the factors that might be negatively associated with it, such as pain. It is also important that therapeutic interventions are well-balanced and use integrated multidisciplinary approach to improve participation and social inclusion of individuals with CP.

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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 Slovenian National Ethics Committee, application number: 122/05/13. After receiving verbal and written information about the study, all caregivers signed written consent.

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ENCOURAGING EMPLOYEES TO REPORT VERBAL VIOLENCE IN PRIMARY HEALTH CARE IN SERBIA: A CROSS-SECTIONAL STUDY

SPODBUJANJE ZAPOSLENIH K PRIJAVI VERBALNEGA NASILJA V OSNOVNEM ZDRAVSTVENEM VARSTVU V SRBIJI: PRESEČNA ŠTUDIJA

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ABSTRACT

Keywords:

verbal workplace violence, contributing factors, health workers

Introduction. Workplace violence is a serious and multidimensional problem that adversely affects professional and personal lives of employees. The aim of this study was to assess the prevalence and characteristics of verbal violence as a part of psychological violence among employees in primary health care in Belgrade, and to identify contributing factors of verbal violence in the workplace.

Methods. In this cross-sectional study, the final analysis included 1526 employees, using multi-stage sampling. Data were collected using the questionnaire Workplace Violence in the Health Sector Country Case Studies Research, developed by ILO/ICN/WHO/PSI. Descriptive statistics and logistic regression analysis were used to analyse the data. The general response rate was 86.8% (1526/1757).

Results. It was found that 47.8% of the participants were subjected to verbal violence. The main source of verbal violence was patient/client, 55.6% of employees did not report the incident. Among those who did not report the incident, 74.9% believed that reporting violence was useless. The interaction with patients (OR, 1.45; 95% CI, 1.02-2.06) and work between 6pm and 7am (OR, 1.27; 95% CI, 1.01-1.60) were significant contributing factors of verbal violence.

Conclusion. The results are indicative of a high prevalence of verbal violence against employees in primary health centres, which could have undesirable consequences. Conducting a better organizational measure and encouraging employees to report workplace violence could reduce the prevalence of verbal violence.

IZVLEČEK

Ključne besede:

verbalno nasilje na delovnem mestu, dejavniki spodbujanja, zdravstveni delavci

Uvod. Nasilje na delovnem mestu je zelo resna in večdimenzionalna težava, ki prizadane strokovno in osebno življenje zaposlenega. Cilj te študije je ovrednotenje razširjenosti in lastnosti verbalnega nasilja kot del psihološkega nasilja med zaposlenimi v osnovnem zdravstvenem varstvu v Beogradu ter prepoznavanje dejavnikov, ki prispevajo k verbalnemu nasilju na delovnem mestu.

Metode. Zaključna analiza presečne študije vključuje 1526 zaposlenih z uporabo vzročenja na več stopnjah. Zbiranje podatkov je potekalo z uporabo vprašalnika 'Raziskava študije primerov držav glede nasilja na delovnem mestu v zdravstvenem sektorju' (Workplace Violence in the Health Sector Country Case Studies Research), ki ga je razvil program ILO/ICN/WHO/PSI. Za obdelavo podatkov so bile uporabljene opisne statistike in logistično regresijska analiza. Splošna stopnja odzivnosti je bila 86,8% (1526/1757).

Rezultati. Izkazalo se je, da je bilo 47,8% sodelujočih podvrženo verbalnemu nasilju, glavni vir verbalnega nasilja pa je bil s strani pacienta/stranke, 55,6% zaposlenih pa dogodka ni prijavilo. Med vsemi, ki dogodka ni prijavilo, jih 74,9% verjame, da bi bila prijava odveč. Stik s pacienti (OR, 1,45; 95% CI, 1,02-2,06) in delovni čas med 18h in 7h (OR, 1,27; 95% CI, 1,01-1,60) sta dejavnika, ki znatno prispevata k verbalnemu nasilju.

Zaključki. Rezultati nakazujejo visoko razširjenost verbalnega nasilja med zaposlenimi v zdravstvenih centrih, kar lahko povzroči neželene posledice. Boljši organizacijski ukrepi ter spodbujanje k prijavi nasilja na delovnem mestu bi lahko zmanjšalo razširjenost verbalnega nasilja.

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1 INTRODUCTION

Workplace violence is a serious and multidimensional problem that adversely affects professional and personal lives of employees (1, 2). Violence appears as physical violence or as psychological violence in different forms. Psychological violence (Emotional abuse) is "Intentional use of power, including threat of physical force, against another person or group, that can result in harm to physical, mental, spiritual, moral or social development" (3, 4). It includes verbal abuse, bullying/mobbing, harassment and threats. Verbal violence is behaviour that humiliates, degrades or otherwise indicates the lack of respect for the dignity and worth of an individual. Psychological violence should be considered more deeply, because results of studies indicate a high prevalence of this kind of violence (5-7).

Psychological workplace violence can lead to a decrease in job satisfaction, quality of life and productivity (8, 9). It might, consequently, lead to an increase in medical errors, the reduction of patient care quality, and it might have negative effects on the employee-patient communication (10, 11). Employees in health care institutions are at the top of the list of occupations with a high level of stress and the risk of workplace violence (12).

Studies from twenty years ago showed that verbal violence was the most frequent type of violence, but the true prevalence of it is unknown and varies from country to country (4, 13, 14). Verbal violence against healthcare workers ranges from 23.2% to 97.8% (7, 15, 16).

Globalization and intense transition are expected to increase the number of victims of violence in the workplace (4, 17). In the last two decades, Serbia faced different challenges. It was a period of transition and reforms in all social and economic areas, including health care system. In the period from 2005 to 2010, an increase of workplace violence from 48.7% to 64.2% was recorded, which was reported by non-governmental organizations or trade unions (18). In Serbia, there is a legal basis for the prevention of abuse at work, which should provide greater security for employees: The Constitution of the Republic of Serbia, Labour Law, Law on the Prevention of Workplace Harassment, Discrimination Law, Law on Safety and Health at Work (19). In spite of this, there is no sufficient social and media attention given to this problem because of the lack of information about the types of assistance available, the procedures to report violence, and the lack of strategies which might reduce or prevent verbal violence.

The aim of this study was to assess the prevalence and characteristics of verbal violence as a part of psychological violence among employees in primary health care in Belgrade, and to identify contributing factors of verbal violence in the workplace.

2 MATERIALS AND METHODS

2.1 The Study Design and Participants

This cross-sectional study was conducted among employees in primary healthcare in Belgrade, conducted between October 2012 and July 2013. The study population was medical (1320 (86.6%)) and non-medical employees (205 (13.4%)). Multistage random sampling was conducted in three phases. Details of the study design, population and sampling procedures are described in another article (20).

2.2 Data Collection

Data were collected using the questionnaire Workplace Violence in the Health Sector Country Case Studies Research, developed by ILO/ICN/WHO/PSI (3, 21). The questionnaire was translated into Serbian by a multidisciplinary team, following standard methods of translating, and adapted to the context of Serbian PHCs to improve clarity and appropriateness of our situation (22). The high test-retest reliability was achieved; Spearman was 0.91 and kappa coefficients were ≥ 0.90 . A pilot questionnaire was tested in a group of 20 health workers at the beginning of the study and two weeks after it (20). This questionnaire contains four sections to assess personal and workplace information (27 items), physical violence (25 items), psychological workplace violence (emotional abuse), including verbal abuse, mobbing, sexual harassment and racial harassment (57 items), the health sector (5 items). In this study, our results are associated only with verbal violence, because of the extensive amount of data involved.

2.3 Data Analysis

Descriptive statistics were used to analyse the data (the prevalence of exposure to verbal violence and the frequency of socio-demographic and work characteristics, the reaction of employees to verbal violence), using the SPSS software version 20. Univariate analyses were conducted to assess the association between each independent variable (socio-demographic and work characteristics) and the outcome variable, verbal violence [yes/no]. All variables which were significantly associated with the outcome measure ($p < 0.05$) were entered into a multiple logistic regression model. The odds ratio (OR) and confidence intervals (95% CIs) were calculated. The Hosmer-Lemeshow goodness-of-fit test was used to assess the validity of the logistic models. (23).

3 RESULTS

A general response rate was 86.8% (1526/1757). The final analysis included 1526 employees, 243 men (15.9%) and 1280 women (83.9%). There was no significant association between the exposure to workplace verbal violence

and gender, age, marital status and years of work experience. However, the prevalence of verbal violence was significantly higher among employees who interacted with patients, worked in shifts, and worked between 6pm

and 7am ($P < 0.001$; see Table 1). Furthermore, verbal violence was more prevalent among employees who had more education (Table 1).

Table 1. Socio-demographic and work characteristics of participants ($n=1526$)^a.

Variable, n (%)	Verbal violence			p-value
	Yes (729)	No (797)	OR (95% CI)	
Gender				
Male	103 (14.1)	140 (17.6)	1.00 (Reference)	0.062
Female	626 (85.9)	654 (82.4)	1.30 (0.99-1.72)	
Age				
≤29	55 (7.6)	64 (8.1)	1.00 (Reference)	0.252
30-49	454 (62.4)	422 (53.2)	1.25 (0.85-1.84)	
≥50	219 (30.1)	307 (38.7)	0.83 (0.56-1.24)	
Marital status				
Married/Permanent relationship	509 (70.2)	586 (73.6)	1.00 (Reference)	0.139
Single	216 (29.8)	210 (26.4)	1.18 (0.95-1.48)	
Education level				
Primary	9 (1.2)	25 (3.1)	1.00 (Reference)	0.016
Secondary	369 (50.6)	397 (49.9)	2.58 (1.19-5.60)	
College	80 (11)	85 (10.7)	2.61 (1.15-5.94)	
Faculty	271 (37.2)	289 (36.3)	2.60 (1.19-5.68)	
Professional group				
Physician	208 (28.5)	230 (28.9)	1.00 (Reference)	0.094
Nurse	462 (63.4)	420 (52.8)	1.22 (0.97-1.53)	
Other	59 (8.1)	146 (18.3)	0.45 (0.31-0.64)	
Years of work experience				
≤10	155 (21.3)	152 (19.1)	1.00 (Reference)	0.881
11-20	246 (33.8)	236 (29.6)	1.02 (0.77-1.36)	
>20	327 (44.9)	408 (51.3)	0.79 (0.60-1.03)	
Working in shifts				
No	117 (16.0)	210 (26.3)	1.00 (Reference)	<0.001
Yes	612 (84.0)	587 (73.7)	1.87 (1.45-2.41)	
Working between 6pm and 7am				
No	441 (60.5)	556 (69.9)	1.00 (Reference)	<0.001
Yes	288 (39.5)	239 (30.1)	1.52 (1.23-1.88)	
Interacting with patients during work				
No	79 (10.8)	176 (22.1)	1.00 (Reference)	<0.001
Yes	650 (89.2)	621 (77.9)	2.33 (1.75-3.11)	
The age group of patients				
Preschool children	49 (6.8)	34 (4.7)	1.00 (Reference)	0.070
School children	87 (12.1)	98 (13.5)	0.62 (0.36-1.04)	
Adults	391 (54.3)	436 (60.0)	0.62 (0.39-0.98)	
Elderly	193 (26.8)	159 (21.9)	0.84 (0.52-1.37)	
The number of staff in the same work setting				
> 20	598 (82.0)	607 (76.2)	1.00 (Reference)	0.005
≤ 20	131 (18.0)	190 (23.8)	0.70 (0.55-0.90)	
An encouragement to report workplace violence				
No	379 (52.0)	332 (41.8)	1.00 (Reference)	<0.001
Yes	350 (48.0)	463 (58.2)	0.66 (0.54-0.81)	

^a The sum may be less than the total number of participants because of the missing data

48% of employees reported that they had been subjected to verbal violence at the workplace. Verbal attacks occurred most often sometimes (82.0%) and inside health organizations (97.4%). The main source of verbal violence was the patient/client (52.1%) (Table 2).

Table 2. Characteristics of verbal violence in the workplace (n=729).

Variables	Values, n(%)
The exposure to verbal violence	
No	797(52.2)
Yes	729(47.8)
How often	
All the time	54(7.4)
Sometimes	598(82.0)
Once	77(10.6)
Who verbally abused	
A patient/client	380(52.1)
Relatives of a patient/client	104(14.3)
A staff member	156(21.4)
The management	79(10.8)
An external colleague/worker	4(0.5)
The general public	4(0.5)
The place of verbal violence occurrence	
Inside health organizations	710(97.4)
At a patient's home	10(1.4)
Outside (on one's way to work)	7(1.0)

Out of all participants who experienced verbal violence, 45,7% told to a colleague and 55.6% of employees did not report the incident. Among those who did not report the incident, 74.9% believed that reporting violence was useless (Table 3). Participants could mark more than one answer to questions related to reactions toward violence and reasons for not reporting the incident.

Table 3. Reactions of employees to verbal violence (n=729).

Variables	Values, n(%)
Reactions of participants toward violence	
Told a colleague	333(45.7)
Told the person to stop	313(42.9)
Told friends/family	197(27.0)
Took no action	183(25.1)
Tried to pretend it never happened	148(20.3)
Sought help from the union	33(4.5)
Completed the incident form	32(4.4)
Sought counselling	12(1.6)
Tried to defend themselves	5(0.7)
Reporting the incident	
No	406(55.6)
Yes	323(44.3)

Variables	Values, n(%)
Action taken with regard to the incident occurred	
No	510(70.1)
Yes	93(12.8)
Do not know	125(17.2)
The source for taking the action	
The management	65(67.7)
An employer	23(24.0)
The union	0
The association	0
The police	4(4.2)
Satisfaction with the manner in which the incident was handled	
Very dissatisfied	301(44.6)
Dissatisfied	189(28.0)
Moderately satisfied	121(17.9)
Satisfied	24(3.6)
Very satisfied	37(5.5)
The reason for not reporting the incident	
It was not important	60(14.8)
Felt ashamed	10(2.5)
Felt guilty	0
Afraid of negative consequences	78(19.2)
Useless	304(74.9)
Did not know whom to report	61(15.0)

Many of employees who have experienced verbal violence had disturbing memories, thoughts, or images of the abuse (69.3%) (Table 4).

Table 4. Reactions and complaints that employees experienced after verbal violence (n=729). Reactions of employees to verbal violence (n=729).

Variables	Values, n(%)
Disturbing memories, thoughts, or images of the abuse	
No	223 (30.6)
Yes	506 (69.3)
Avoiding thinking or talking about the abuse	
No	319 (43.8)
Yes	410 (56.1)
Being watchful and on guard	
No	254 (34.8)
Yes	475 (65.2)
Feeling like everything you had done was an effort	
No	313 (43.0)
Yes	416 (47.0)

Multiple logistic regression analyses (Table 5) indicated that nurses, as a professional group (OR=2.57, 95% CI: 1.59-4.13), who work between 6pm and 7am (OR=1.34, 95% CI: 1.07-1.68), interact with patients during work (OR=1.77, 95% CI: 1.26-2.47), with less than 20 employees in the same work setting (OR=1.43, 95% CI: 1.10-1.85) and with no encouragement to report workplace violence (OR=1.56, 95% CI: 1.28-1.96), were predictors of verbal violence.

Table 5. Multiple logistic regression model with verbal violence as the dependent variable.

Independent variables	Values, n(%)	
A professional group		
A physician	1.00 (Reference)	
A nurse	2.57 (1.59-4.13)	<0.001
Other	0.97 (0.60-1.57)	0.897
Working in shifts		
No	1.00 (Reference)	
Yes	1.30 (0.97-1.74)	0.083
Working between 6pm and 7am		
No	1.00 (Reference)	
Yes	1.34 (1.07-1.68)	0.011
An interaction with patients during work		
No	1.00 (Reference)	
Yes	1.77 (1.26-2.47)	0.001
The level of education		
Primary	1.00 (Reference)	0.480
Secondary	0.73 (0.30-1.75)	0.657
College	0.81 (0.32-2.04)	0.355
Faculty	1.52 (0.62-3.70)	
The number of staff in the same work setting		
≤20	1.00 (Reference)	0.008
>20	1.43 (1.10-1.85)	
An encouragement to report workplace violence		
Yes	1.00 (Reference)	
No	1.56 (1.28-1.96)	<0.001

4 DISCUSSION

The results indicated that 47.8% of employees had been exposed to verbal violence. Workplace violence has increased in countries worldwide (4, 24). The prevalence rates of verbal violence were from 29.8% to over 82% in the previous studies (15, 25). According to our knowledge, there is not a lot of research on workplace violence and mobbing conducted in Bosnia and Herzegovina, and 76% of physicians self-reported one or more types of mobbing

behaviour (26). In Slovenia, the study was conducted on health care workers in emergency departments in primary and secondary health care, and it showed that 74.2% of them experienced verbal or other forms of indirect verbal violence at the workplace (27). These results confirm that verbal violence against healthcare workers is a serious problem (7, 16, 28).

Our study showed that patients were the main source of verbal violence. In most other studies, patients are attackers, followed by their relatives or employees (25, 29). In our study, verbal violence is 1.5 times more common among employees who interact with patients during work. This finding might indicate the miscommunication between patients and healthcare workers, especially nurses. Nurses are the group of health professionals who are at risk for workplace violence in our study and most other studies (9-11, 29). The studies showed that workplace violence among nurses, compared to other professional groups, is a frequent problem, and has negative effects on nurses' health, work, and therefore on the quality of care (1, 10, 11, 30). Nurses are the first to come into contact with patients and their relatives. It is necessary to improve the quantity and quality of their communication with patients (14). Patients may either feel that they did not receive an appropriate treatment or what they deserved, or that they did not receive the treatment in time (16, 31). It is possible that patients are impatient because of the nature of a disease or because of a crowd. Besides illness, it is possible that many of them are under the influence of alcohol, drugs, or possessing weapons (4, 25).

Working in night shifts is considered to be a high-risk factor for the exposure to violence, which is confirmed by other and our research findings, while working between 6pm and 7am, according to our study, is about 1.3 times more frequent to be a risk factor for the exposure to violence among employees. Higher rates of violence during night shifts can be attributed to personnel who are required to work alone, and are under stress caused by patients' self-assessment that the need for care was urgent, long waiting times for procedures, the failure to obtain necessary services promptly, or poor work and working conditions (25, 32). In our study, the exposure to verbal violence occurred more often in the work settings with 20 and more employees. It is known that workers in medium- and large-sized organisations experienced workplace violence more often than those in small-sized organisations (33).

In the current study, more than half of the participants did not report violence. In other studies, despite a high prevalence of verbal violence, participants also did not report violence (7, 28, 30). The encouragement to report workplace violence and increased awareness and information on the occurrence of workplace violence are measures that contribute to better reporting and combating

violence (29, 34, 36). In our study, the encouragement to report workplace violence was 53.3%.

In this study, participants considered reporting useless (74.9%), because they were concerned that they may suffer another assault by reporting it, or feared losing their jobs (36). The lack of reporting could be due to the lack of proper feedback from officials and the lack of proper guidelines for violence reporting. Moreover, this might indicate that health care workers do not trust legal institutions (37, 38).

The strength of this study is a better understanding of workplace violence, because the real size of the problem is still unknown, and this study provides the data about it. One of strengths is that the prevalence of workplace verbal violence is determined. Another strength of this study is that it explains the relationship between predictors of verbal violence and verbal violence itself, and provides the ability for planning measures against workplace violence as well as the basis for future research.

There were some limitations in the present study. First, the data were collected retrospectively, and self-reports may cause recall bias and underreporting. Second, the findings of this study cannot be generalized and are limited to the workplaces in the study. Also, the results may suffer from a misunderstanding of the workplace violence definition or the lack of willingness to share private information.

5 CONCLUSION

In conclusion, the results are indicative of a high prevalence of verbal violence against employees in primary health centres, which could have undesirable consequences. Contributing factors of verbal violence include the interaction with patients during work, a large number of staff in the same work setting, and working between 6pm and 7am. The majority of the participants were not inclined to report verbal violence because they thought it would have been useless and due to the lack of encouragement to do so. Conducting better organizational measures and encouraging reporting workplace violence could reduce the prevalence of verbal violence.

CONFLICTS OF INTEREST

The authors declare that no conflicts of interest exist.

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None.

ETHICAL APPROVAL

The study was approved by the Secretariat of Health of Belgrade and by the Ethics Committee at the University of Belgrade, the Faculty of Medicine. The participation in the research was voluntary. Anonymity, confidentiality and privacy of data were explained and guaranteed. Before research, in order to obtain verbal consent, every employee received relevant details regarding the background and objectives of the survey.

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CROSS-CULTURAL ADAPTATION AND VALIDATION OF NASAL OBSTRUCTION SYMPTOM EVALUATION QUESTIONNAIRE IN SLOVENIAN LANGUAGE

MEDKULTURNA PRILAGODITEV IN VALIDACIJA VPRAŠALNIKA NOSE O OCENI ZAMAŠENOSTI NOSU V SLOVENŠČINI

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ABSTRACT

Objectives. Nasal obstruction is highly subjective perception with numerous efforts being made towards objective measuring. Many instruments in quality of life studies encompass subjective symptom of nasal obstruction, but only NOSE has been properly validated and is easy to use in every day practice.

Keywords:

nasal obstruction, quality of life instruments, cross-cultural adaptation of questionnaires

Methods. Multicenter prospective instrument validation and cross-cultural adaptation cohort study was conducted on patients with deviated nasal septum, with or without inferior turbinate hypertrophy, to develop the Slovenian version of NOSE questionnaire. A cross-cultural adaptation of the original questionnaire was done in five steps, producing Slovenian NOSE-si, used on a pilot group to confirm the quality of adapted tools and, afterwards, on the main study and control group. Symptoms were lasting for more than 12 months and all had an indication for septal surgery. A control group was selected from a pool of healthy subjects, self-assessed as having no rhinological complaints.

Results. NOSE-si was used on 116 patients (58 from the study group vs. 58 from the control group). High degree of internal consistency - Cronbach's α 0.971 and reliability after retesting - Goodman-Kruskal gamma coefficient 0.984 was proven. Responsiveness was confirmed in the surgery subgroup with standardized response mean (SRM) 2.76 ($p < 0.001$).

Conclusions. The study produced a valid Slovenian version of NOSE questionnaire through rigorous and well defined five-phase effort to maintain scientifically comparable QoL instrument, and may be used by clinicians and researchers.

IZVLEČEK

Ključne besede:

nosna obstrukcija, vprašalniki o kakovosti življenja, medkulturna prilagoditev vprašalnikov

Uvod. Zamašenost nosu je pogost simptom pri boleznih nosu in obnosnih votlin. Veliko poskusov objektivizacije zamašenosti nosu ni prineslo zadovoljivih rezultatov. Obstaja več vprašalnikov o kvaliteti življenja, ki zajemajo tudi zamašenost nosu. Vprašalnik NOSE je validiran, torej globalno primerljiv, zanesljiv in odziven ter dovolj enostaven za vsakodnevno uporabo.

Metode. Študija je multicentrična, prospektivna, validacijska, kohortna, z medkulturno prilagoditvijo vprašalnika o kakovosti življenja. S petstopenjsko medkulturno adaptacijo je nastala slovenska različica vprašalnika - NOSE-si. Validacijo smo opravili pri bolnikih z deviacijo nosnega pretina s hipertrofičnimi spodnjimi nosnimi školjkami ali brez njih, z indikacijo za operacijo nosnega pretina in simptomi, daljšimi od 12 mesecev. Posamezniki brez subjektivnih težav z zamašenostjo nosu so sestavljali kontrolno skupino.

Rezultati. NOSE-si je izpolnilo 116 bolnikov (58 v študijski skupini in 58 v kontrolni skupini). Dokazali smo visoko stopnjo notranje skladnosti s Cronbachovim koeficientom α 0,971. Zanesljivost pri ponovnem testiranju smo dokazali z Goodman-Kruskal gama koeficientom 0,984. Odzivnost smo dokazali na kirurški skupini bolnikov pred intervencijo in po njej s standardno mediano odziva 2,76 ($p < 0,001$).

Zaključki. V študiji smo z jasno definiranim petstopenjskim postopkom uspešno prilagodili in potrdili vprašalnik NOSE-si. Vprašalnik je na voljo uporabi v kliničnem in raziskovalnem delu.

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1 INTRODUCTION

Blocked nose or nasal obstruction is a frequently encountered nasal symptom (1). Nasal obstruction is defined as a discomfort, manifested as a feeling of insufficient airflow through the nose (2). The prevalence of nasal obstruction has been estimated at 26.2% (3). It is often a complex clinical problem, involving mucosal, structural, and even psychological factors. The perception itself is subjective, with many efforts being made towards objective measuring (4). Etiology of nasal obstruction can vary, from deviation of the nasal septum, turbinate hypertrophy, adenoid hypertrophy to mucosal congestion or nasal masses (5). To evaluate the effectiveness of surgical treatment or change in quality of life (QoL), an instrument called Nasal Obstruction Symptom Evaluation (NOSE) was developed and validated (6). NOSE questionnaire is not the only QoL instrument used by researchers in rhinology. Some of them are not fulfilling the definition of health-related quality of life instrument (HRQL), as Chronic Sinusitis Survey (CSS) or even Sinonasal Outcome Score 22 (SNOT-22). Some instruments do not evaluate only nasal obstruction, like Allergy Outcome Score (AOS) (7). Subjective symptoms like nasal obstruction remain important in quantifying an aspect of disease not detected by objective testing, and are representing real burden for the patient (8). Standardized questionnaires allow researchers to produce comparable data from disease specific QoL studies (9). Nevertheless, true equivalence between the original and adapted questionnaires can be achieved only through cross-cultural adaptation (CCA). CCA is a delicate process, but it is faster than creating a new questionnaire, and it is assumed to produce an equivalent instrument (10). The process of CCA must be rigorous enough and should involve well-defined steps with the initial translation, synthesis, back translation, expert committee review and pretesting (10-12). The aim of our study was to create a Slovenian Nasal Obstruction Symptom Evaluation (NOSE-

si) with a high degree of equivalence with the original NOSE questionnaire, using the proposed strategy (12).

The original English instrument was not designed to be used on an individual patient or predict the outcome of intervention, but it can evaluate nasal obstruction in any disease, not only in rhinitis or rhinosinusitis (7).

2 METHODS

2.1 Study Design

A multicenter prospective instrument validation and CCA cohort study were conducted according to published methods and guidelines (6, 11, 13), in four phases (Table 1). The first phase started on 1st December, 2014. Patients meeting the inclusion criteria (nasal obstruction due to deviated nasal septum, with or without inferior turbinate hypertrophy, with symptoms lasting more than 12 months and indication for septal surgery) were enrolled consecutively at University Clinical Centre Ljubljana - the Department of Otorhinolaryngology, General Hospital Novo mesto - Ear, Nose and Throat Department (ENT), General Hospital Celje - ENT Department, Community Health Centre Maribor - ENT Outpatient Clinic. The enrollment ended on 1st June, 2015.

Exclusion criteria were: a) a prior surgery in the nose or paranasal sinuses; b) allergic rhinitis; c) pregnancy; d) hyperplastic rhinitis as a single entity; e) chronic rhinosinusitis according to EPOS guidelines (14); f) age less than 18; g) perforation of the nasal septum; h) craniofacial syndromes or tumors of the nose or paranasal sinuses; i) sarcoidosis or granulomatosis of the nose; j) bronchial asthma, adenoid hypertrophy; k) recent trauma of the nose - up until 2 years from the event; l) being unable to communicate in or understand Slovenian language.

A control group was selected from a pool of healthy subjects, self-assessed as having no rhinological complaints. All patients agreed and signed a written consent form.

Table 1. Cross-cultural adaptation (phases and steps leading to adapted and validated QoL tool).

Phase I	Cross-cultural adaptation of the original NOSE questionnaire in five steps, according to emerging guidelines (7, 15).
Step I	Two experts in rhinology blinded one to another translated the original NOSE questionnaire.
Step II	A third expert reviewed both translations and created a new version.
Step III	A fourth expert reviewed it, blinded to both initial versions.
Step IV	The latest version was sent to a translator with no medical background to form and backtranslate.
Step V	A board of experts (3 rhinologists, 1 audiologist, 3 general ENT consultants, 1 family medicine practitioner, 1 ENT specialist in training, 1 non-medical translation consultant) reviewed results and synthesized the final version of NOSE-si. It was proofread, and the final report was created.
Phase II	The pilot phase consisted of submitting NOSE-si to a limited number (n=33) of patients in the study group and control group. Patient and expert comments with results were reevaluated by an expert committee and a preliminary statistical analysis was done to compare the pilot version of NOSE-si to the original tool and other CCA processed NOSE questionnaires (13, 16). Since high degree of internal consistency reliability was found, the expert committee accepted NOSE-si as the final version.

Phase III Both the study and control group were enrolled. Retesting was scheduled 7-14 days after the initial testing for the study group and controls (90 patients). Patients had to fill out the same questionnaire and send it back to the researchers.

Phase IV The postintervention test in the study group (90 days after surgery - submucosal resection of nasal septum).

A group of patients fulfilling the outpatient follow up date by the end of the study was selected for the postintervention test (Table 1) as phase IV. All patients had septoplasty in local or general anesthesia as indicated primarily by each involved author. Details of surgery were not recorded as this was not the goal of the study. Authors were encouraged not to change their standard diagnostic or operative technique, but they were not blinded to the preinterventional score.

2.2 The Questionnaire

The NOSE questionnaire is structurally composed of five items, namely: 1) nasal congestion or stuffiness; 2) nasal blockage or obstruction; 3) trouble breathing through my nose; 4) trouble sleeping; 5) unable to get enough air through my nose during exercise or exertion (6). All items are scored using the 5-point Likert scale with the range from 0 to 4 (Table 2). Results are scaled to the total range from 0 (no nasal obstruction) to 100 (the most severe nasal obstruction) by multiplying the row score by 5.

Table 2. NOSE (the original questionnaire).

	Not a problem	Very mild problem	Moderate problem	Fairly bad problem	Severe problem
Nasal congestion or stuffiness	0	1	2	3	4
Nasal blockage or obstruction	0	1	2	3	4
Trouble breathing through my nose	0	1	2	3	4
Trouble sleeping	0	1	2	3	4
Unable to get enough air through my nose during exercise or exertion	0	1	2	3	4

2.3 Statistics

Cronbach's α with inter-item and item-total correlation was used to estimate internal consistency reliability. Cronbach's α 0.70 or higher was considered as acceptable internal consistency reliability (6). Content validity was confirmed during each CCA step. An expert review, harmonization, cognitive debriefing and a review of patients' comments were done according to the study design. Mann-Whitney U test was used to confirm construct discriminant validity by comparing group discrimination ($p < 0.05$).

Cohen's d test was used to confirm convergent validity. The values of 0.2, 0.5, 0.8 represent low, moderate and high sensitivity, respectively. Standardized response mean (SRM) and effect size (ES) were used to assess sensitivity in the study group 90 days after intervention (surgery). Responsiveness was confirmed with standardized response mean in addition to previous Cronbach's α (17). Test-retest reliability was assessed with Goodman Kruskal gamma. Data analysis was carried out using the SPSS version 22 statistical software (SPSS Inc, Chicago, IL). Computation of effect sizes, SRM and Cohen's d was done online (18, 19).

3 RESULTS

The study consisted of 116 patients with detailed data in Table 3.

Table 3. Clinical characteristics of study patients.

	Study group (with complaints) (n=58)	Control group (no complaints) (n=58)	P value (study vs. control)
Sex			
Male	15 (25.7%)	27 (46.6%)	
Female	43 (74.3%)	31 (53.4%)	0.004‡
Age (y)	37.8 (\pm 13.92)	40.1 (\pm 14.43)	0.452*
Body mass index (BMI)	25.21 (\pm 4.19)	22.85 (\pm 3.86)	0.003*
Smokers	16 (27.6%)	14 (24.1%)	0.832‡
Mean NOSE-si score	70.52 (\pm 15.46)	3.97 (\pm 5.9)	<0.001**

* Independent samples Mann Whitney U test, ‡ Fisher's Exact test, **T-test

The internal consistency of NOSE-si was excellent with Cronbach's α 0.971. Inter-item and item-total correlations are reported in Table 4. All items had a significant correlation with each other, thus confirming the instrument as a single unified construct. Above all, all individual items are measuring the exact same concept ($r > 0.800$).

Table 4. NOSE-si correlation (inter-item and item-total correlation; original NOSE field names are used).

Inter-Item Correlation Matrix					
	Nasal congestion or stuffiness	Nasal blockage or obstruction	Trouble breathing through my nose	Trouble sleeping	Unable to get enough air through my nose during exercise or exertion
Nasal congestion or stuffiness	1.000	0.916	0.899	0.822	0.881
Nasal blockage or obstruction	0.916	1.000	0.909	0.844	0.887
Trouble breathing through my nose	0.899	0.909	1.000	0.851	0.875
Trouble sleeping	0.822	0.844	0.851	1.000	0.800
Unable to get enough air through my nose during exercise or exertion	0.881	0.887	0.875	0.800	1.000

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Nasal congestion or stuffiness	6.02	32.208	0.929	0.875	0.961
Nasal blockage or obstruction	5.91	32.027	0.942	0.892	0.959
Trouble breathing through my nose	5.92	31.933	0.934	0.875	0.960
Trouble sleeping	6.09	32.800	0.864	0.755	0.971
Unable to get enough air through my nose during exercise or exertion	5.84	32.567	0.905	0.828	0.965

The study group had the mean rank of 87.50, and the control group had the mean rank of 29.50 (Mann Whitney U-test $p < 0.001$). Cohen's d test as effect size estimate was 5.73 (CI 0.95, 1.75-7.25) confirming the needed large discrimination between study groups and controls with a nearly perfect effect score.

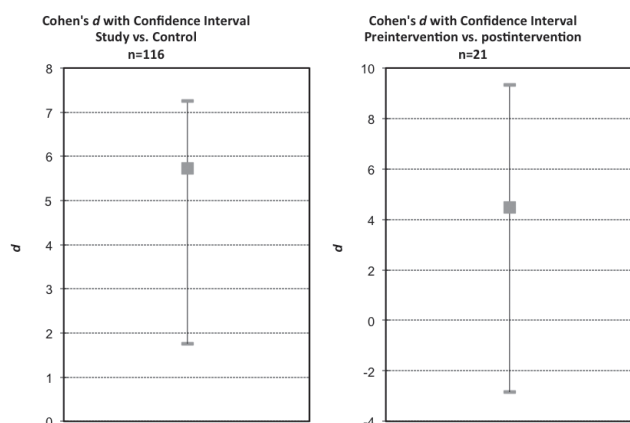


Figure 1. Effect size estimate (the left side showing large discrimination, the right side showing efficacy of intervention).

Responsiveness of the NOSE-si was confirmed on a group of patients with surgical intervention ($n=21$), comparing pretreatment NOSE-si score to posttreatment NOSE-si score. Standardized response mean (SRM) was 2.76 ($p<0.001$) and is considered very large. As is efficacy of intervention, with effect size estimate (Cohen's d) of 4.58 (CI 0.95, -2.74-9.34), as seen in Figure 1.

The reproducibility of the questionnaire was confirmed with retesting, and compared to the baseline score (the initial/preintervention NOSE-si score in controls/study group, cumulative $n=90$, Table 1.), using Goodman-Kruskal gamma coefficient 0.984 ($p<0.001$), proving excellent reliability.

4 DISCUSSION

The subjective assessment of nasal obstruction requires validated survey instruments. In case when a linguistically native instrument is not available, the full process of CCA should be performed to acquire valid QoL questionnaires and scientifically comparable results. The process itself is a multistage effort to maintain comparable contents. The NOSE-si instrument was developed according to principles of good practice (15) and emerging guidelines (11). Internal consistence reliability, test-retest reliability, psychometric properties, validity and response sensitivity were very high. There is no sample size or power calculation for psychometric evaluation (6), and the general rule of thumb with 25 to 50 patients is considered adequate, therefore we opted for multicentric setup and higher sample size. Our study had one of the largest sample sizes found in literature (20-23). Our validation results were comparable with English-language validation by Stewart

et al. (6). The study design can explain the differences between groups when comparing basic demographic data, such as sex or BMI to some extent. Otherwise, these factors are not affecting the main goal of our study - the validation of QoL tool, with NOSE-si score comparison in distinct groups (Table 3). It should be emphasized that the study group may not represent the entire population of patients with nasal obstruction, as consecutive sampling was used. The study design (multicentric, referral centers) should broaden the base for sampling. We observed comparable scoring of the new instrument NOSE-si and published normative and symptomatic ranges (24). Our inclusion criteria were strict, all patients from study group fulfilled the criteria for a surgical intervention, as this is traditionally the main target group for the instrument (25). Having used broader criteria, the discrimination between groups would be less pronounced; but on the other hand, the study design would be less adherent to the original validation studies. The sample size for responsiveness is less than the declared minimum of 25. Given the rather vast statistical significance of the results, they may not be compromised. We were also unable to fully blind the surgeon to the preinterventional NOSE-si score, which could ideally influence the postinterventional score by following a more aggressive, still standard surgical technique (26). On the other hand, the NOSE score itself can be influenced by many other objective and subjective factors (27). We were trying to eliminate most of them by using the same simple and standard diagnostic and treatment protocols across the study. For the same reason, we opted not to use any additional objective measures, as they are not routinely used in participating centers.

5 CONCLUSIONS

The study produced a valid Slovenian version of NOSE questionnaire through rigorous and well-defined five-phase effort to maintain a scientifically comparable QoL instrument. It represents a proven excellent basic tool and may be used by clinicians and researchers as a reliable score of nasal patency related patient-reported quality of life measure.

6 LIMITATIONS OF THE STUDY

Our study had no limitations other than discussed in section 4.

CONFLICTS OF INTEREST

The authors declare that no conflicts of interest exist.

ETHICAL APPROVAL

Research has been performed in accordance with the Declaration of Helsinki. The study was approved by the Republic of Slovenia National Medical Ethic Committee by document number 114/04/14 dated 21th of April 2015.

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THE EVALUATION OF MRSA SURVEILLANCE CULTURES BY THE NUMBER AND COMBINATIONS OF ANATOMICAL SITES

VREDNOTENJE NADZORNIH KUŽNIN NA MRSA PO ŠTEVILU IN MESTU ODVZEMA

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ABSTRACT

Keywords:

surveillance sample, MRSA, MRSA control, meticillin-resistant *Staphylococcus aureus*

Introduction. The identification of patients infected and/or colonised by methicillin resistant *Staphylococcus aureus* (MRSA) is necessary for the timely introduction of measures for infection control. We compared the diagnostic efficacy of combinations of MRSA surveillance swabs routinely taken by health institutions in the country.

Methods. All surveillance samples, which were sent for a microbiological analysis to detect MRSA with the culture method in 2014, in the three departments for medical microbiology of the National Laboratory for Health, Environment and Food, were included in this study.

Results. Among 65,251 surveillance cultures from 13,274 persons, 1,233 (2.1%) were positive (490 positive persons). Prevailing positive surveillance cultures were throat swabs (31.3%), followed by nose swab (31.2%), skin swab (18.9%), perineum (16.4%) and wound swabs (1.4%). The contribution of other samples, such as aspirate, urine and excreta, was under 1%. We found no statistically significant differences in the frequency of detection of a positive patient, if the combination of samples NTS (nose, throat, skin) or NTP (nose, throat, perineum) was analysed. However, statistically significant differences were confirmed when any of the anatomic sites would be omitted from the sets of NTP and NTS (chi square; $p < 0.01$). Adding additional samples resulted in only 24 additional positive patients (4.9%).

Conclusions. The results indicate that increasing the number of surveillance cultures above three does not add much to the sensitivity of MRSA surveillance, the exception could be wound. The swabs from the perineum and from the skin are exchangeable.

IZVLEČEK

Ključne besede:

nadzorne kužnine, MRSA, obvladovanje MRSA, proti meticilinu odporna bakterija *Staphylococcus aureus*

Izhodišča. Odkrivanje bolnikov, okuženih in/ali koloniziranih s proti meticilinu odporno bakterijo *S. aureus* (MRSA), je nujno za pravočasni pričetek ukrepov obvladovanja okužb, povezanih z zdravstvom. Primerjali smo diagnostično učinkovitost kombinacije rutinsko poslanih nadzornih brisov na preiskavo za MRSA.

Metode. V študijo smo vključili vse nadzorne kužnine, ki so bile poslane na mikrobiološko preiskavo za MRSA s kultivacijo v letu 2014 na treh oddelkih za medicinsko mikrobiologijo Nacionalnega laboratorija za zdravje, okolje in hrano.

Rezultati. Med 65.251 nadzornimi kužninami od 13.274 oseb je bilo 1233 (2,1%) pozitivnih (490 posameznih pozitivnih oseb). Med pozitivnimi nadzornimi kužninami je prevladoval bris žrela (31,3%), sledili so bris nosu (31,2%), bris kože (18,9%), bris perineja (16,4%), rane (1,4%). Delež ostalih kužnin, kot so aspirat, urin, blato, je bil pod 1%. Ugotavljali smo, da ni statistično pomembnih razlik v deležu zaznanih nosilcev, če imamo kombinacijo nos, žrelo, koža ali nos, žrelo, perinej. Statistično pomembne razlike so, če iz seta nos, žrelo, perinej in nos, žrelo, koža, izločimo katerokoli mesto odvzema ($p < 0,01$). Dodatni vzorci so doprinesli le 24 dodatnih pozitivnih bolnikov (4,9%).

Zaključki. Brisa kože in perineja sta zamenljivi kužnini glede na zaznavanje pozitivnih bolnikov. Rezultati študije kažejo, da ni optimalno povečevati število nadzornih kužnin na več kot tri, ker ne prispeva veliko k občutljivosti, razen rane.

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1 INTRODUCTION

The identification of patients infected and/or colonised by MRSA is necessary for the timely introduction of infection control measures. If MRSA infection/colonisation is determined only with clinical samples, some 20-30% of patients carrying MRSA are not detected (1). The hidden reservoir of carriers is actively searched by surveillance cultures. We try to identify MRSA carriers in hospitals to prevent its spreading to other patients. The effectiveness of the identification of MRSA carriers depends on the optimal selection of the anatomic region of sampling for the surveillance cultures, the number and type of surveillance cultures, transport conditions, the selection of a medium for primary inoculation (preliminary enrichment, non-selective or selective mediums), the methods of pathogen identification and the proper method for the detection of antibiotic sensitivity. Several studies analysed the sensitivity of different anatomic sites of the MRSA surveillance sampling, as well as the effect of the combination of different anatomical sites (2, 3). The studies of the effectiveness of different methods of pathogen detection are difficult to compare, as they are of different designs. Almost each state and institution is using its own variant of carrier detection, adapted to the characteristics of the endemic strain.

The microbiological diagnostics has to be rapid and reliable, but also rational. The rationality may be increased by the optimisation of taking the appropriate number of surveillance swabs from the most appropriate anatomic locations. In our study, we compared the diagnostic efficacy of combinations of MRSA surveillance swabs routinely taken by health institutions in the country.

2 METHODS

Slovenia has an area of 20,273 km² and a population of 2 million. Seven departments of Medical Microbiology of the National Laboratory for Health, Environment and Food (NLZOH) cover more than 13 hospitals, primary care and long-term care facilities, in Slovenia. In our analysis, three departments of the NLZOH, located in Maribor, Celje and Kranj, participated, which serve 6 hospitals, primary care and long-term care facilities, and represent one third of Slovenian population.

All the surveillance cultures included in this study were sent for microbiological detection of methicillin-resistant bacteria *Staphylococcus aureus* (MRSA) from 1 January 2014 to 31 December 2014. The microbiological diagnostics and the computer analysis were performed according to the standard procedures. Data were extracted from the MBL Programme (Infonet version 22.0, Kranj, Slovenia) for surveillance cultures. The programme Kocka 21 (Infonet, version 4.26.0) was used for the analysis of positive results.

2.1 Samples

For each patient who was screened for the MRSA carriage, we got the surveillance swabs from one or more anatomic sites. If two or more swabs from the same patient were sent, the term "Surveillance sample set (SSS)" was used. The labellings for surveillance swabs from similar anatomic sites were grouped into one category (Table 1). We might get the surveillance swabs of the same patient on more than one occasion, so the same patient could be repeatedly represented. For the analysis of sensitivity, only SSSs with more than 3,000 patients were considered. The types of SSSs analysed were nose, throat and skin (NTS) at the Department of medical microbiology in Celje (DMM Celje); nose, throat, perineum (NTP) at the DMM in Kranj; and both at DMM in Maribor.

Table 1. NOSE (the original questionnaire).

Category	Anatomic sites				
Nose	Nose	Naso-pharynx			
Perineum	Perineum	Anus	Perianal	Rectum	
Skin	Skin	Groin	Axilla	Ear	Swabs of stoma (tracheostoma, gastrostoma, ileostoma and colostoma), cannula and tubus
Wound	Wound	Pressure sore	Lesion		
Tracheal aspirate	Trachea aspirate	Trachea swabs			
Urine	Urine				
Faeces	Excreta				

2.2 Laboratory Methods

The swabs for the MRSA detection were inoculated on to the chromogenic medium (MRSA smart (bioMerieux, Paris, France) or CHROMagar MRSA (CHROMagar, Paris, France)) and in the liquid medium (THBS) (Oxoid, Basingstoke, United Kingdom). After 24-hour incubation, the liquid medium was subcultured on a hard chromogenic medium (MRSA Smart, CHROMagar MRSA). All *S. aureus* isolates were confirmed by standard diagnostic procedures. The identification was performed with MALDI-TOF technology (Bruker Daltonik GmbH, Bremen, Germany) or by DNase activity test, the latex agglutination test and the catalase test.

The sensitivity of *S. aureus* isolates was tested with the standardised disc diffusion method, according to the CLSI (1.1. to 31.3. 2014) and EUCAST (1.4. to 31.12.2014) (4, 5). Minimal inhibitory concentration (MIC) determination of oxacillin and vancomycin was performed using the E-test (bioMerieux, France).

2.3 Statistical Methods

The results are presented descriptively: the number of received samples, the number of positive samples, the number of positive surveillance sample sets (SSSs) and the number of positive patients in each DMM of the NLZOH. All SSSs with at least one positive swab were included in the next analysis phase. For positive SSSs, the number of positive surveillance cultures per patient were counted and grouped into categories according to combinations of anatomical locations. For SSSs with positive surveillance cultures on more regions, the diagnostic sensitivity decrease was calculated if the results of the swabs from certain anatomic points were not considered. The sensitivity of different sample combinations was analysed only in the group of patients where the same samples (SSSs) were taken: respectively, in the group of patients with swabs from the NTP and in the group with swabs from the NTS. The statistical significance of the differences between the proportions of positive patients regarding the SSS used for specimen sampling was checked with the Chi-squared test.

3 RESULTS

In the year 2014, a total of 65,251 surveillance cultures (SC) were received (Table 2). The proportion of positive surveillance cultures was 1.89% (the range among laboratories was from 1.3 to 2.7%). Of 13,274 persons, 490 (3.69%) were positive for MRSA.

Table 2. The type and number of SC for MRSA analysis.

	Maribor	Celje	Kranj	Total
The number of received SC	32,389	21,500	11,362	65,251
The number of positive SC	430	492	311	1,233
The % of positive SC	1.3%	2.3%	2.7%	1.9%
The number of SSS	no data***	7,105	3,565	/
The number of positive SSS	231	260	170	661
The % of positive SSS	no data***	3.7%	4.8%	/
The number of examined persons*	6,141	5,050	2,083	13,274
The number of positive persons**	152	203	135	490
The % of positive persons	2.5%	4.0%	6.5%	3.7%
Positive SC in one anatomic site	101	106	83	290
Positive SC in two anatomic sites	65	80	45	190
Positive SC in three anatomic sites	58	72	34	164
Positive SC in four or more anatomic sites	7	2	8	17

*- if repeated surveillance swabs were received from a single patient, such patient was counted once only

**- each MRSA positive patient was counted once only

***- the data management in Maribor did not allow to group the swabs of MRSA negative patients into "Surveillance sample set (SSS)".

SC: surveillance cultures

The rates of positive samples are presented in Table 3. Throat swabs were the most prevalent surveillance swabs taken (31.3%), followed by nose (31.2%), skin (18.9%) and perineum swabs (16.4%). The most frequent among all MRSA positive surveillance cultures were nasal swabs (33.9%) followed by throat (29.4%), skin (18.5%), perineum (13.1%) and wound swabs (4.22%). Other samples, such as the aspirate, urine and faeces, represented less than 0.8% of all surveillance samples and less than 1% of positive cultures.

Table 3. The type and number of surveillance cultures (SC) sent for the MRSA detection, and the proportion of positive results.

SAMPLE	Total (%)	Positive (%)	% of positive swabs taken form this location
Nasal swab	20,378 (31.2)	418 (33.9)	2.1
Throat swab	20,426 (31.3)	363 (29.4)	1.8
Skin swab	12,319 (18.9) %	228 (18.5)	1.9
Perineum swab	10,707 (16.4)	161 (13.1)	1.5
Wound swab	894 (1.4)	52 (4.2)	5.8
Tracheal aspirate/sputum	200 (0.3)	3 (0.2)	1.5
Vaginal swab	13 (0.0)	0 (0.0)	0.0
Urine	289 (0.4)	4 (0.3)	1.4
Stool	25 (0.0)	4 (0.3)	16.0
TOTAL	65,251 (100)	1233 (100)	1.9

The proportions of positive anatomical locations and sensitivity of cultures regarding the anatomical location and combinations of swabs from different locations are shown in Table 4. The largest proportion of positive patients in the NTP set was detected by the nasal swab (67.7%). The same applies also for the NTS sets (66.7%). This means that the nasal swab was the most sensitive specimen in these two sets. The perineum swab was the most frequent sample being single positive in the NTP. With the exclusion of the perineum from the standard set of swabs, 15.3% of MRSA positive patients would have gone undetected. The skin swab was the most frequent sample being single positive in the NTS. With the exclusion of the skin swab from the standard set of swabs, 15.6% of MRSA positive patients would have been lost. We compared the statistical significance of the added sensitivity of the perineum swab in the NTP (29 single perineum positive patients out of 189) with the added sensitivity of the skin swab (43 single skin positive patients out of 276) in the NTS. No statistically significant difference was found between the sensitivity of the skin swab and the perineum swab (chi square 0.353; $p > 0.05$), which means the skin and perineum were exchangeable cultures in respect of the MRSA carriage detection.

In the case that we decrease the number of surveillance swabs from three to two per patient, the smaller proportion of MRSA positive patients would be lost in the NTP set, if the throat swab would have been excluded (12.7), and in the NTS set, if the nose (12.7%) or throat (13.0%) swab would have been excluded (Table 4 B and D). However, statistically significant differences were confirmed; when any of the anatomic sites would have been omitted from the sets of the NTP and NTS (chi square; $p < 0.01$).

Considering swabs from additional anatomic locations, we identified only 24 additional positive patients (4.9%). Those locations were the wound (19), stool (3), tracheal aspirate (1) and urine (1). Among them, the most frequently positive sample was the wound swab.

Table 4. The sensitivity of surveillance cultures regarding the anatomical location and combination of swabs.

A MRSA positive locations in the nose, throat, perineum (NTP) set.

A combination of locations	Total (%)
The number of MRSA positive patients with the nose, throat, perineum set	189 (100)
The number of patients with the MRSA in all three swabs	59 (31.2)
The number of patients with the MRSA in the nose and perineum	23 (12.2)
The number of patients with the MRSA in the nose and throat	18 (9.5)
The number of patients with the MRSA in the throat and perineum	8 (4.2)
The number of patients with the MRSA in the nose only	28 (14.8)
The number of patients with the MRSA in the perineum only	29 (15.3)
The number of patients with the MRSA in the throat only	24 (12.7)

NTP: nose-throat-perineum; SSS: Surveillance sample set

We took the NTP as a kind of “gold standard” (obviously, that would mean 100% sensitivity, because we had no other method which would show us how many colonized patients were not detected with the NTP) to somehow put the sensitivities of other SSS into perspective.

B The sensitivity of different combinations of surveillance swabs included in the NTP SSS.

SSS	Sensitivity
NTP	100
NT	86.7
NP	87.3
TP	85.2
N	67.7
T	57.7
P	62.9

N: nose; T: throat; P: perineum

C MRSA positive locations in the SSS NTS.

A combination of locations	Total (%)
The number of MRSA positive patients with the NTS set	276 (100)
The number of patients with the MRSA in all three swabs	74 (26.8)
The number of patients with the MRSA in the nose and skin	35 (12.7)
The number of patients with the MRSA in the nose and throat	40 (14.5)
The number of patients with the MRSA in the throat and skin	13 (4.7)
The number of patients with the MRSA in the nose only	35 (12.7)
The number of patients with the MRSA in the skin only	43 (15.6)
The number of patients with the MRSA in the throat only	36 (13.0)

NTS: nose-throat-skin; SSS: Surveillance sample set

D The sensitivity of different combinations of surveillance swabs included in the NTP SSS.

SSS	Sensitivity
NTS	100
NT	75.0
NS	87.0
TP	75.0
N	66.7
T	59.1
S	34.0

N: nose; T: throat; S: skin

4 DISCUSSION

We aimed to establish the appropriate number of surveillance cultures and appropriate combination of surveillance cultures to detect patients colonized with the MRSA. We found that the combination of three samples of the NTS (nose, throat, skin) or NTP (nose, throat, perineum) was significantly more sensitive in detecting the MRSA colonisation over single or double anatomic site swabs with the skin and perineum being exchangeable. Adding additional samples resulted in 4.9% of additional positive patients, with the majority of additionally identified patients being MRSA positive in the wound swab.

Among 65,251 surveillance samples, 1.9% were positive for the MRSA, confirming that Slovenia is among the countries with low prevalence of MRSA carriers (6). However, we detected marked differences in regions of Slovenia, with the eastern part detecting three times less MRSA colonised patients compared to the western part. Prevailing surveillance cultures sent to laboratories were throat swabs (31.3%), followed by nasal swabs (31.2%). Around two thirds of MRSA colonised patients were identified by nasal swabs. However, although rarely taken, the highest positive rate was found for stool cultures. The most frequent indication for the stool sample is detection of the MRSA in the intestine, in known MRSA carriers before decolonisation, therefore those patients are a selected population, and results should be discussed concerning these facts.

Similarly, Ide et al. showed that the nasal swabs provide both the largest number of overall MRSA isolates as well as the largest number of MRSA isolates found at a single site (7). This suggests that the nose is the most important MRSA screening site. In contrast some other studies, we found the largest proportion of positive throat samples, confirming that the throat swab is also an important specimen (8, 9). The sensitivity of the MRSA carrier detection increased when throat, nose and perineum swabs were taken simultaneously (7, 9).

A longitudinal follow up study of MRSA colonised patients showed that nasal swabs had the sensitivity and the negative predictive value of 93% and 95%, respectively, compared to the axilla, groin and perineum, with the sensitivity and the negative predictive value of less than 39% and 69%, respectively (10). When the number of screening samples from the same patient was increased with simultaneous sampling from the nose, throat and perineum, the sensitivity increased to 98.7%, with the negative predictive value of 99.8%.

The nose was the most sensitive anatomic site with the best prediction value for the detection of the MRSA and also MSSA carriage (11). Persons colonized in the nose are often colonized at more anatomic areas simultaneously. The study of Cursino et al. showed that the use of only nasal swabs is insufficient, with sensitivity of 67%, compared to four anatomical site sampling (the nose, anus, perineum, and oropharynx) (3). Even in the combination of two anatomic sites, the detection of the carriers was too low, being 80% with the nose and pharynx sampled simultaneously.

In our study, the sensitivity of different sample combinations was analyzed only in the groups of patients in which the same surveillance sample sets were taken, that is, in the group of patients with cultures from the nose, throat, perineum, and the group from the nose, throat and skin cultures. Those two groups of patients

were also the largest, as those SSS are recommended by the National Committee for Healthcare-associated Infection Control and Prevention in Slovenia (12). Our analyses demonstrated that the nose was the most prevalent positive culture in the NTP and NTS SSS, with over two thirds of MRSA colonised patients positive at that location. By the exclusion of the perineum sample from the NTP SSS, a large proportion of MRSA positive patients (15.3%) would have been lost; the same would happen in the NTS set, if the skin would be excluded (15.6%). A smaller proportion of MRSA positive patients would be lost, if the throat or nose would be excluded (12.7-13.0%). The results of our study thus indicate that the use of three surveillance cultures is reasonable in the majority of subjects. The exception might be the adding of the wound swab in patients who present with the wound, as also proposed by Ide and Dutch Workingparty on Infection Prevention (7, 13, 14).

The highest sensitivity is obtained by the combination of sampling sites. Datta et al. sampled 6 sites in ICU (intensive care unit) patients. Combining the nose and throat culture, they were detecting 95% of colonised patients (9).

In dermatological patients, the best sensitivity was obtained by combining nose, wound and skin lesion swabs (15). German dermatologists recommend the combination of nose, skin and skin-lesion smears as surveillance samples.

In newborns, the best surveillance samples for the MRSA are the navel swab (68% sensitivity) or the combination of the nose and navel swab (91% sensitivity). In pregnant women, the sensitivity of the nasal swab was 67% and the sensitivity of the nose and throat combination 80% (3).

In a meta-analysis, McKinnell and colleagues showed that, by adding additional locations to nasal swabs, approximately one-third more colonised subjects are identified, regardless of the severity of patients and prevalence of the MRSA (16). Adding pharyngeal swabs identifies 21% more patients compared to the nasal swab alone; rectal swabs 20%; wound swabs 17%; and axillar swabs 7%.

The carriage in the alimentary tract is detected by the surveillance culture from the throat, the perineum and the rectum (17). Lautenbach et al. confirmed that nostrils are the prime MRSA colonized site with the throat as the second, and that more anatomic points have to be sampled to reach 90% sensitivity with previously confirmed colonised patients (18). If the throat smear had not been taken, 5-7% of colonized patients would have been lost. The anatomic areas of colonization were different with the CA-MRSA and HA-MRSA. The groin and the perineum were the sites most often colonized in CA-MRSA positive patients.

The Dutch Guideline on the Laboratory Detection of Methicillin-resistant *Staphylococcus aureus* proposes that the surveillance samples from patients and medical staff include the nasal swab (both front nostrils), the throat and perineum or rectal swab (14). The perineal carriage is frequent and in some carriers it is a unique point of colonization. Perineal and rectal swabs are of comparable sensitivity for the MRSA carriage detection. Some previous studies also showed that the groin swab could be used as an alternative to the perineum swab, but for the moment, there is not enough evidence for such a recommendation. It is also important to consider that MRSA density in the axilla and perineum is lower than in the nose. Therefore, the preliminary enrichment in a liquid enrichment medium is even more important with these samples (19). Lauerdale et al. found that 66.2% of MRSA colonised patients would be lost, if only direct cultures from nostrils were used without additional samples from the nose, axilla and perineum, and without the use of a liquid enrichment medium (20). In our study, the contribution of the enrichment medium was estimated to be 26.8% (21).

The Dutch experts propose additional sampling sites according to the clinical status and age of the patients: the sputum, if the patient has a productive cough, or aspirate in intubated patients; the skin swab in case of skin-lesions, including eczema; the urine in the case of urine catheter; and the navel swab with newborns. The results of the large study demonstrate that the cultivation of catheter or drainage entering point swabs has no additional value in the MRSA colonization detection (14). To optimize the costs of MRSA surveillance programs, it should be borne in mind that the MRSA carriage without decolonization lasts for months, so in most cases, it is not reasonable to repeat the surveillance sampling with a MRSA positive patient (22).

The pooling of multiple anatomical site swabs of a patient into a single culture seems an attractive way to decrease costs of the MRSA surveillance; however, we advise against such an approach (21). The first reason is that the location of individual colonization affects the clinical decision with regard to the treatment strategy. The second reason is that pooling of clinical samples disturbs the performance of the classical diagnostic procedure and decreases the sensitivity to 86%, compared to the diagnostics of individual samples.

There are limitations to our study. It relied on the retrospective analysis of routine cultures. The surveillance standards differed in different health care institutions, so many patients could not be included in the analysis of the prevalent SSS due to missing swabs from certain locations. We were not aware of the characteristics of the patients, that is, whether they were hospitalised in medical wards or ICU. We were also not aware whether

positive patients were only colonized, or whether some also had a clinically important MRSA infection. There were also no data of prior decolonization. It was also not clear whether wound swabs, tracheal aspirates and faeces were sent as surveillance specimens, or whether those were clinical specimens. On the other hand, we were able to analyze a very large database of routinely obtained data, thus reflecting everyday clinical practice.

The effective MRSA surveillance depends largely on the adequate laboratory detection of MRSA. The MRSA carrier detection can be enhanced with the use of liquid enrichment media and the inclusion of additional anatomic sites alongside the nasal swab. The results of our study verify that the selection of the surveillance procedures is very important in the optimisation of surveillance samples. It seems prudent to combine swabs from the nose, skin and gastrointestinal locations. It is rarely beneficial to increase the number of the surveillance samples over three, the exception could be the wound or other skin lesion swab. There is no need to combine smears from the perineum and from the skin, as they are exchangeable.

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CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

ETHICAL APPROVAL

All the data analyzed in this study were collected at the National Laboratory for Health, Environment and Food, without information about the identity of individuals diagnosed with MRSA colonisations, according to the Contagious Diseases Act, Health Care Databases Act and Communicable Diseases Reporting Regulation. The study was conducted in accordance with the code of Ethics of the World Medical Association (Declaration of Helsinki).

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THE ADAPTATION AND IMPLEMENTATION OF GUIDELINES FOR RESPONSIBLE MEDIA REPORTING ON SUICIDE IN SLOVENIA

PRIREDBA IN IMPLEMENTACIJA STROKOVNIH SMERNIC ZA ODGOVORNO NOVINARSKO POROČANJE O SAMOMORU V SLOVENIJI

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ABSTRACT

Keywords:

suicide, prevention, media guidelines

Introduction. The existing literature provides evidence of the link between media reporting and suicide in terms of either preventive or provocative effects. Hence, working with media representatives on responsible reporting on suicide is of great importance. Until recently in Slovenia, there has been an obvious lack of communication between media representatives and suicidologists. The aims of the present study were two-fold; firstly, to introduce the adaptation and dissemination of intervention on responsible media reporting, and secondly, to evaluate the effectiveness of the implemented intervention on suicide reporting.

Methods. We used a pre-post research design. Newspaper articles were retrieved over two 12-month periods: the baseline period and the follow-up period. In between, we had a year of implementation of our intervention program (launching and disseminating the Guidelines via workshops). Each retrieved article was rated qualitatively with respect to its adherence to the Guidelines.

Results. The comparison of baseline and follow-up periods revealed some significant differences. Reporting in the follow-up period was less sensationalistic, there was less reporting about specific cases of suicides and more about causes of suicide and pathways out of mental distress. Furthermore, in the follow-up period, there was a significant improvement related to headlines of media articles. Contact information about where to seek help was more often included in the articles.

Conclusion. The findings are promising, but working with the media needs to be continuous and ongoing if sustainable results are to be achieved.

IZVLEČEK

Ključne besede:

samomor, preventiva, medijske smernice

Uvod. Obstoječa literatura ponuja vrsto dakovov o povezavi med medijskim poročanjem in samomorilnim vedenjem, bodisi v smislu preventivnega ali negativnega učinka. Zaradi tega je delo z medijskimi strokovnjaki na področju preprečevanja samomora zelo pomembno. Do nedavnega je bilo sodelovanje na tem področju v Sloveniji pomanjkljivo. Namen pričujočega prispevka je dvojen: prvič predstaviti postopek priredbe in implementacije intervencijskega programa za odgovorno novinarsko poročanje o samomoru, ter drugič, evalvirati učinkovitost intervencijskega programa na poročanje o samomoru.

Metode. Uporabili smo pred-po raziskovalni načrt. Pridobili smo članke iz tiskanih medijev iz dveh 12-mesečnih obdobj: obdobje pred intervencijo in obdobje po intervenciji. Vmes je potekalo obdobje implementacije intervencijskega programa. Za vsak članek smo ocenili, ali je v skladu s strokovnimi smernicami za odgovorno novinarsko poročanje ali ne.

Rezultati. Primerjava člankov iz obdobja pred intervencijo in po intervenciji je pokazala nekatere statistično značilne razlike. Poročanje o samomoru je bilo v obdobju po intervenciji manj senzacionalistično, manj je bilo poročanja o konkretnih primerih samomora in več o primerih stisk, ki so se razrešile na konstruktivne načine. Prišlo je do pozitivne spremembe v naslovih prispevkov, pravtako pa je več prispevkov navajalo vire pomoči.

Zaključki. Ugotovitve študije so vzpodbudne, vendar je potrebno kontinuirano delo z mediji, če želimo doseči trajnostne rezultate.

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1 INTRODUCTION

Four decades ago, Phillips (1) reported that suicide rates significantly increased after suicide reports were published on the front page of the New York Times. It was then that he first introduced the term 'Werther effect', which has since become synonymous with the suicide-inducing impact of media reporting. Since the groundbreaking research of Phillips, the Werther effect - also referred to as the 'copycat effect' due to specific media portrayals of suicidal behaviour - was well replicated in other studies. It was found that the imitation risk partially depends on the characteristics of the reader (2), as well as on the topic and style of the media (3). Factors most commonly mentioned to influence imitation include media coverage (4), an explicit description of suicidal methods and place (5, 2), sensationalism and glorification of suicide (6).

As a counterpart to the Werther effect, Niederkrothenthaler and colleagues (7) coined the term 'Papageno effect' to shift the attention to suicide-protective impact of media reporting, which the term refers to. Reports can have a preventive effect if the focus is on the treatment of mental illness and suicidal behaviour (8), encouraging those at risk to seek help and refuting myths about suicide (9), focusing on individuals who have overcome their suicidal crisis by adopting functional coping strategies (7). Even though the media can have a protective effect, according to Sisask and Varnik (10), there is a reporting bias, since more research is available on the Werther, rather than Papageno effect.

Based on the findings that media reports about suicide can cause imitation, as long ago as in 1996, the World Health Organization listed responsible reporting on suicide, in particular toning down reports, among the most important cornerstones of suicide prevention (3, 11). Media guidelines for responsible reporting on suicide were since developed and adopted in many countries (11, 12). The evidence from literature shows that the implementation of the guidelines has had an effect on the quality of suicide reporting (13-16); however, journalists' awareness, use and opinion about guidelines appears to be low (13). In their study, Michel and colleagues (15) found that reporting about suicide has changed after the intervention (was more in compliance with the guidelines), but that in the follow-up period, more stories on suicides were published. That reporting was more in compliance with the guidelines after the intervention was also found by Pirkis and colleagues (17).

In the most optimistic scenario, the implementation of the guidelines has had an impact on the number of suicidal acts. One of the first documented cases is Austria, where the introduction of media guidelines in 1987 resulted in the reduction of suicides in the Viennese subway (14). Furthermore, Niederkrothenthaler

and Sonneck (18) proved that implementing guidelines in Austria did not only have a positive impact on the Viennese subway suicides, but also on the reduction of suicides nationwide. The nationwide effect is thought to be the result of a continuous and nationwide collaboration with media representatives. Nevertheless, as noted by Niederkrothenthaler and Sonneck (18), other factors may have been important, and possibly contributed to the decrease in suicides in Austria (i.e., changes in the labour market, an increase in the sale of antidepressants). Indeed, in their review of the most effective suicide prevention interventions, van der Feltz and colleagues (19), next to working with media representatives, list also a cooperation with general practitioners, public awareness campaigns, training sessions for gatekeepers and community facilitators, self-help activities for high risk groups, improvement of access to care and restriction of access to means. Similar targets of suicide prevention interventions were also identified by Mann and colleagues (20), who, on the basis of their review results, emphasized that more studies would need to focus on the evaluation of the impact of media guidelines.

Maloney and colleagues (12) found that the existing media recommendations (in different countries) vary with regard to included preventive factors and the attention dedicated to new media development. Hence, the need for the optimization of responsible media reporting is in place.

Summing up, work with media representatives is of great importance when combating suicide at the public health level, especially in high-risk countries. Slovenia is regarded a high suicide-risk country. Its average suicide rate in the years 1990-2000 was 30.0/100 000. In the last fifteen years, however, the suicide rate significantly decreased in both genders and in the majority of age groups (21), with average suicide rate between the years 2000-2014 dropping to 23.8/100 000 (22). Even though many initiatives were undertaken to tackle this public health problem, the collaboration with the media was a malnourished field. Until recently, there has been an obvious lack of communication between suicidologists and media representatives with regard to their role in suicide prevention. One of the main reasons that the collaboration was hindered was the non-existence of media guidelines in the Slovenian language. Thus, in 2010, media guidelines were developed in Slovenia, and implemented nationwide. The aim of the present paper is, firstly, to describe the process of adaptation and implementation of the guidelines in Slovenia, and secondly, to evaluate whether the intervention has had any effects on the quality of reporting about suicide. To our knowledge, the present study is the first of this kind conducted on a Slovenian sample.

2 METHODS

2.1 Procedure

2.1.1 The Adaptation of the Media Guidelines

The adaptation of media guidelines to the Slovenian language was a joint action of four institutions, which, among others, work on suicide prevention in Slovenia, namely: the National Institute of Public Health, UP Institute Andrej Marusic (Slovene Centre for Suicide Research), National Organization for Quality of Life OZARA, and Slovene Association for Suicide Prevention. The adaptation procedure can be divided into four basic steps, as shown in Figure 1.

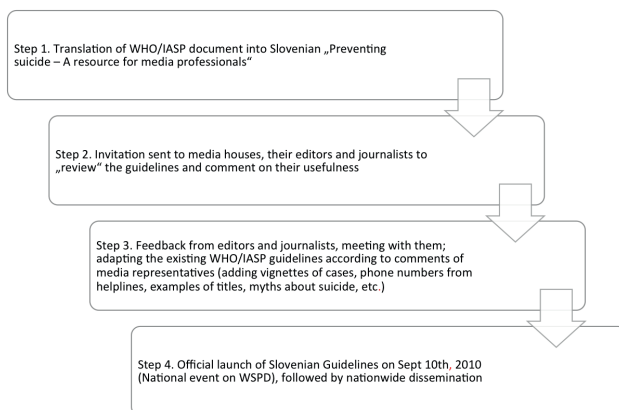


Figure 1. Four steps applied in the adaptation of the Media guidelines.

Firstly, we translated the original version of the WHO document ‘Preventing suicide: a resource for media professionals’ (11) into the Slovenian language (Step 1). We then circulated the translated version to seven editors and journalists (radio $n=1$; printed media $n=3$; television $n=3$), with whom the authors of the paper closely collaborated in the past, and asked them for critical feedback on the guidelines (Step 2). In particular, the media representatives were asked to review the guidelines in terms of their usefulness, clarity, what they would want to add and what might be missing. A meeting was held with journalists a month after the initial request was sent out to them (Step 3). We gathered their comments and observations and adapted the original version of the WHO guidelines according to their feedback. We added: (i) ethical considerations, (ii) examples of reporting where the copycat effect is minimized/maximized (23), (iii) a table with examples of appropriate vs. less appropriate terms/expressions, (iv) a table with examples of appropriate vs. less appropriate titles, (v) a table with examples of appropriate vs. less appropriate photographic material, (vi) telephone numbers of help lines and other sources of help, (vii) vignettes of appropriate reporting

(on a suicide attempt of a youngster, suicide of a celebrity person, suicide during recession), (viii) guidelines on how to deal with a suicidal individual on a live show (24), and (ix) a text in which most common myths about suicide are debunked.

The final version of the Slovenian media guidelines (25) was publicly released on September 10, 2010 (World Suicide Prevention Day 2010), when we held a launch event, with the president of Journalists’ Honour Court being one of the main speakers (Step 4).

As described in the section Research design, steps 2-4 are already considered to be a part of the intervention phase, since the communication and collaboration with media representatives was very intense in this period, and we had no control over the wider spread of information (e.g., by the ‘snowball effect’).

2.1.2 The Implementation (Dissemination) of the Guidelines

The overall implementation process was coordinated by the National Institute of Public Health (NIPH), relying on the network of nine regional units, one in each of the nine health regions in Slovenia. Representatives of the regional units were asked to facilitate the implementation of the guidelines in their domestic region by sending out invitations to local media representatives and by being advocates of the guidelines. We believed that if the invitations were sent and signed by someone known to local media representatives, the intervention would receive greater attention and response.

Within the period Sept 10, 2010 - April 30, 2011, we held one 90-minute workshop in each of the nine health regions, with the local media representatives. At the workshop, each attendee received a free copy of the media guidelines, and the content of the booklet was introduced and thoroughly discussed. An emphasis was placed on exchanging opinions between representatives of suicidology and journalism on what is known about the Werther and Papageno effects, etc., rather than on teaching and being patronizing.

After we concluded with workshops in all nine health regions, we sent a PDF-copy of the guidelines to the Journalists Honour Court and The Chamber of Slovenian Journalists, and asked them to disseminate the booklet to their members.

2.2 Research Design

A pre-post research design was used to evaluate the effectiveness of the intervention. The main research question was whether the intervention has had any effect on the quality of reporting about suicide. Articles from printed media matching the keyword *suicid** (in Slovenian

samomor*) were retrieved via Kliping - Company for Media Analysis and Follow Up. The papers were retrieved for two 12-month periods: the baseline period (May 1, 2009 - April 30, 2010) and follow-up period (May 1, 2011 - April 30, 2012). In between, we had a year of intervention, which we divided into two parts: part 1 (May 1, 2010 - Sept 9, 2010), which included communication with media representatives, adaptation and finalization of guidelines, and part 2 (Sept 10, 2010 - April 30, 2011), which included dissemination workshops. A detailed process diagram is given in Figure 2.

2.3 The Sample and Analysis

Altogether, 2,255 papers from printed media were retrieved from Kliping for the baseline and follow-up period. Articles addressing suicide in relation to acts of terrorism or on a phrasal/metaphorical level (e. g., political suicide), and articles not directly addressing suicide were excluded from further analysis. After applying the exclusion criteria, 342 papers were eligible for analysis (Figure 2).

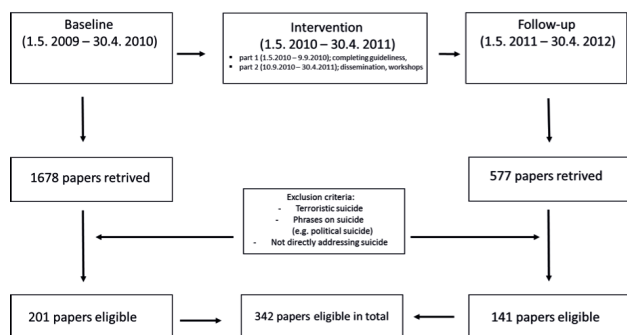


Figure 2. A process diagram for selecting articles eligible for the analysis.

In each eligible paper, we were assessing the presence of the following qualitative elements (guidelines) referring to the content of the paper: (i) the headline of the article (the usage of the word 'suicide'), (ii) an inappropriate photographic material, (iii) detailed descriptions of a suicide method, (iv) detailed descriptions of a suicide location, (v) informing the public about the reasons for suicide, (vi) a non-sensationalistic writing style, (vii) careful reporting about VIP suicides (celebrities), (viii) displays of empathy towards the grieving/bereaved, (ix) stating suicide-prevention resources (e. g., emergency line phone numbers), (x) general information about suicide-prevention resources and where to seek help, and (xi) real-life stories of those who overcame their hardships. Not all guidelines were applicable to all papers.

For the purposes of assessment, two categories were formed, namely: provocative aspects of media reporting and preventive aspects of media reporting. A similar method was also used by Sisask, Varnik, and Wasserman (26). The respective guidelines were classified into one or the other of the two categories (see Table 1). Eligible papers were rated according to whether they referred to each of the listed provocative and preventive aspects of reporting (yes/no). All articles were analysed by one researcher (SR), since there is a high level of objectivity of the guidelines and the evaluations are assumed to be reliable. Since the researcher analysing the articles was not blind to the status of the articles (i.e., whether the articles were from the pre- or post-intervention sample), we checked for the reliability of the analysis. A sample of 10% randomly selected articles (eligible for analysis) was analysed by a second researcher (ATG), who was blind to the status of the articles. We calculated the percentage of match between the two raters. The match was observed in 87.51% of ratings across all guidelines on selected cases, upon which we conclude that the evaluations made by the SR on the whole sample are sufficiently reliable. For each aspect of reporting, the number of articles showing a provocative or preventive aspect in the baseline and follow-up periods was compared. Hypotheses about the efficacy of intervention leading to the change towards more responsible reporting were tested with one-sided Fischer's exact tests, at the 5% alpha error rate.

3 RESULTS

The overall number of suicide-related papers has decreased in the follow-up period (N=141), in comparison to the baseline (N=201). In the baseline period, 70 articles (35%) reported on specific cases of suicide, whereas this number decreased to 29 (21%) in the follow-up period. The decrease in the percentage of articles covering specific cases of suicides was statistically significant, $p=.003$. The ratio between the annual number of published papers reporting on specific cases of suicide and the annual absolute number of suicide cases revealed that, in the baseline period, 16.1 papers were published per 100 suicides, whereas in the follow-up period, only 6.8 papers were published per 100 suicides.

As can be seen in Table 1, in 6 out of 11 guidelines, statistically significant changes in the expected direction were observed in the year after the intervention. After the intervention, the usage of the word 'suicide' in the headlines of the articles was reduced by more than 15%, and journalists were significantly more inclined to offer suicide prevention materials alongside the articles, reporting emergency phone numbers and giving details of other sources of help. Statistically significant

differences between the baseline and follow-up period were also found in terms of informing the public about causes and pathways to suicidality, and describing the reasons behind the act. Additionally, in the follow up period, the reporting of experiences of suicidal people who successfully overcame their crisis slightly increased. However, after the intervention, we also observed that the usage of an inappropriate photographic material has increased. This change was unexpected.

Table 1. The number (and percentage in parentheses) of articles in which guideline criteria were present both at the baseline and the follow-up period.

	Baseline (N=201)	Follow up (N=141)	<i>p</i>
Guidelines - The provocative aspect			
Headlines	117 / 200 (59)	61 / 141 (43)	.004
Inappropriate photographic material	34 / 133 (26)	37 / 85 (44)	-- ^a
Detailed descriptions of a suicide method	106 / 133 (80)	56 / 71 (79)	.513
Detailed descriptions of a suicide location	84 / 118 (71)	45 / 69 (65)	.245
Guidelines - The preventive aspect			
Informing the public about the reasons for suicide	35 / 200 (18)	54 / 132 (41)	< .001
Non-sensationalistic writing style	65 / 200 (33)	77 / 140 (55)	< .001
Careful writing about VIP suicides	3 / 11 (27)	2 / 5 (40)	.516
Displays of empathy towards the grieving	19 / 60 (32)	17 / 71 (24)	.215
Stating suicide-prevention resources (e. g., emergency line phone numbers)	6 / 201 (3)	12 / 137 (9)	.020
General information about suicide-prevention resources	21 / 201 (10)	32 / 139 (23)	.002
Real-life stories of those who overcame their hardships	2 / 200 (1)	7 / 133 (5)	.023

^aNo test was applied here, as the change was contrary to the one expected, if this individual guideline for responsible reporting had been effectively implemented.

4 DISCUSSION

The aim of the present paper was to introduce the process of adaptation and implementation of media guidelines in Slovenia, and to evaluate whether the intervention has had any effects on the quality of reporting about suicide.

Even though, in the last decade, many initiatives were undertaken in Slovenia (for details see ref. (21)) to tackle the problem of suicide, the work with media representatives did not receive enough attention. Based on anecdotal reports, we know that a few attempts were made in the past to establish a thorough collaboration between suicidologists and media representatives, but did not turn out to be as fruitful as hoped. The results described in this paper are an outcome of the collaboration between suicidologists and media representatives in Slovenia, which was, in many ways, different from the preceding ones.

From the very beginning, the target group - media representatives - was included in the formation of the guidelines. This probably led to their greater identification with the guidelines and increased media representatives' motivation to participate, rather than them being just passive recipients of information. Furthermore, by inviting them to participate in the phase of guideline formation and development, we might have increased their feeling of being an important partner in suicide prevention. A similar approach was adopted in Australia, where media guidelines were developed in collaboration between media representatives, health professionals and suicidologists (27). A significant figure advocating the intervention and media guidelines was the President of the Journalists' Honour Court, who supported the action throughout the whole process. In line with studies which have similarly included a patron of the intervention (28) or a renowned

member of a target group, we also believe that her involvement has played a significant role in the success of the intervention. In their review, Pirkis and colleagues (27) noted that in most cases the guidelines were not being implemented optimally, since the most typical method of dissemination was mail-out procedure. In this sense, our intervention was a positive exception. In other words, similarly as with the development, in the implementation process, we adopted a similar method as was adopted in Australia (27), conducting face-to face workshops and handing out copies of the guidelines. The network of the NIPH and its regional units has made the nationwide intervention in such a form possible and much easier to implement.

As a consequence of our proactive approach towards media representatives, they themselves got organised and optimised the existing Journalists' Ethical Code in 2010. Until that time, this code of conduct did not refer to suicide reporting at all. The amendments made to the code by journalists' own initiative now include a paragraph referring to circumstances when a journalist is prohibited to report about suicide. Our observations regarding the development and implementation process are hence consistent with those of other authors in that approaches need to be directed towards collaboration (13, 18) and that the optimal results are achieved if the reference group is included (27). Another factor contributing to positive outcomes of our intervention may be the fact that, in the first year of implementation, we have responded to articles (an e-mail sent to the editor of the newspaper and, if known, also to the journalist of the article) that were either complying with the guidelines or not. If a paper did not comply with the guidelines, we pointed out major drawbacks of the article and encouraged the authors and the editor to comply with the guidelines in the future (guidelines were attached to the e-mail). If an article did comply with the guidelines, we expressed our gratitude and satisfaction. Last but not least, our experiences support that of Michel and colleagues (15), who found that the best intervention method proved to be a personal contact with the editor - the personal approach we took was much appreciated by media representatives. Our finding that fewer papers were published on the topic of suicide in the follow-up period are not consistent with those of Michel and colleagues (15), who found quite the opposite. At the workshops with media professionals, we did not advise against suicide reporting (except under certain circumstances as given in the guidelines), but rather to report it ethically and responsibly. The decrease in suicide reports after the intervention can thus perhaps be explained by a more selective and responsible work of media professionals, rather than by them reporting on any suicide story. After the intervention, we have also observed a significant reduction in papers focused on specific cases of suicide. This can be similarly explained by the fact that

journalists were cautious and thoughtful when it came to reporting about suicide, and that a judgement was made as to what is newsworthy and what is not. However, no significant differences were observed between the pre- and post-intervention periods in terms of revealing the suicide method and the location of suicide. This implies that even though the overall number of articles focusing on specific cases of suicide has decreased, the quality of reporting (taking into account these two guidelines - the description of a suicide method and location) has not improved. Nevertheless, a decrease in the number of published papers on specific suicide cases per 100 suicides, from the baseline to the follow-up period, seems to be a positive outcome of the intervention. Regarding the relationship quantity/quality of reporting and the copycat effect, literature provides mixed information. Michel and colleagues (15) argue that it is not the quantity of articles, but rather the quality that is important; on the other hand, Pirkis and colleagues (27) found evidence of the links between the imitation of a type and quantity of news coverage.

After the implementation of the guidelines, the usage of the word 'suicide' in newspaper headlines decreased, which is in line with findings of other researchers (e. g., 14, 15). Furthermore, we observed that the language used in articles published after the intervention was less sensationalistic, which, too, is in accordance with findings of others (15). In contrast to Pirkis and colleagues (17), who found that articles published on suicide after the intervention in Australia did not contain enough referral and preventive information, we found that the number of articles stating suicide-prevention resources (e. g., helplines) and general information on how and where to seek help increased after the intervention. Surprisingly, we noticed an increase in the use of inappropriate photographic material after the intervention. This observation is not in line with findings of other researchers (15), who reported that, after the implementation of the guidelines, the pictures were less sensational. We explain this finding by anecdotal reports from the journalists themselves, who said that even if they had chosen a more sensitive photo, the editor would have prevented it from being published (i. e., editors are looking for a sensationalistic photo). Another possible explanation is that since the journalists have complied with the majority of guidelines after the intervention, it is the photographic material where they want to keep their 'artistic freedom'. Nevertheless, no other negative effects of the intervention were observed. In the period after the implementation, we have noticed a significant increase in the number of articles focusing on stories of persons who have overcome their suicidal crisis. By complying with this guideline, the journalists have contributed enormously to the suicide protective impact of media reporting, which according to Niederkrotenthaler and colleagues (7), increases if the report focuses on

individuals who overcame their suicidal crisis by adopting functional coping strategies. Furthermore, the overall compliance with the guidelines in the post-intervention period was good, since a statistically significant change in the desired direction was observed in 54% (6 out of 11) of guidelines. Hence, we may speculate that in the post-intervention period, there was a tendency towards the Papageno effect.

However, despite the promising results, our study has some limitations worth mentioning. The workshops that took place were a common event for both editors and journalists. According to other authors (7), it is better to conduct separate workshops for these two target groups due to their different needs and work demands. It may be that the requirements of some guidelines (e. g., about photographic material) have reached journalists, but not editors. Also in the future, it would be worthwhile to hold separate meetings for photographers and editors to emphasize the importance of a responsible selection of photographic material. Furthermore, we had briefings with 'serious' and 'tabloid' press representatives at the same time. This, too, does not seem to be a good practice, since the tabloid press is knowingly more sensationalistic, and needs more attention with regard to such reporting and a more directed approach. Another limitation of our study is the fact that we do not know the exact number of journalists who were acquainted with the guidelines, since the guidelines were not only introduced at the workshops, but also disseminated via the journalist association. As a consequence, it is difficult to estimate how many journalists were needed to achieve the introduced positive results.

Nevertheless, this is to our knowledge the first study of this kind conducted on Slovenian data. Not only do the results of our study show that collaboration with media representatives adds to suicide prevention activities in Slovenia, but they also add to the state-of-the-art literature about media and suicide prevention. Future work should definitely focus on the optimization of guidelines according to findings of Maloney and colleagues (12), in order to include new media (e.g., social media). The attention and systematic follow-up of suicide-related publications should be extended from printed to all other forms of media - internet, television, etc. Furthermore, a program of nationwide workshops that would be more regular and systematic (e. g., carried out separately for editors vs. journalist, or for serious vs. tabloid press) would be necessary. New, young journalists should be included. Booster sessions for those who have already had contact with the media guidelines should be ensured. A systematic education on responsible reporting about suicide (with a detailed introduction of media guidelines) should be included in university curricula. Finally, the work with Slovenian media representatives, as also

stated by Niederkrothenthaler and Sonneck (18), must be continuous and nationwide.

5 CONCLUSION

The existing literature provides good evidence that media reporting can be linked to either a suicide provocative or a suicide preventive effect. The existing study describes Slovenian efforts to adapt media guidelines in collaboration with media representatives, and disseminate them nationwide. An evaluation of the intervention revealed that the overall compliance with the guidelines was good, but that there are nevertheless areas which deserve further attention. Some aspects of the quality of reporting have yet to be improved. There is a need for the continuous work with the media and for the optimization of the guidelines.

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CONFLICTS OF INTEREST

The authors declare that no conflicts of interest exist.

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ETHICAL APPROVAL

The data on annual mortality due to suicide were obtained from the National Mortality Database, held at the National Institute of Public Health. The data were analysed without information about the identity of individuals. The study was conducted in accordance with the code of the Ethics of the World Medical Association

(the Declaration of Helsinki). All the analyses were performed on the aggregated data, and did not include personal information.

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THE PERCEPTION OF LOW-SALT BREAD AMONG PRESCHOOL CHILDREN AND THE ROLE OF EDUCATIONAL PERSONNEL IN CREATING A POSITIVE ATTITUDE TOWARDS REFORMULATED FOOD

PERCEPCIJA MANJ SLANEGA KRUHA PRI PREDŠOLSKIH OTROCIH IN VLOGA VZGOJNEGA OSEBJA PRI KREIRANJU ODNOSA DO PREOBLIKOVANEGA ŽIVILA

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ABSTRACT

Keywords:

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salt reduction

Introduction. The purpose of this study was to identify the possibility of unnoticed reduction in salt content of bread as a basic food in the diet of preschool children. The response of children to less salty bread and the role of teachers and teacher assistants in the introduction of novelties into children's nutrition were studied.

Methods. Using hedonic sensory evaluation in the case of bread, the perception of salty taste and responses of preschool children to salt reduction were observed. The combination of quantitative and qualitative data analysis obtained from the case study group, composed of 22 preschool children and 66 teachers and teacher assistants, was studied.

Results. The results show that a 30% salt reduction was not registered by the children, while a 50% reduction of the salt content, compared to the original recipe, though noted, was not disruptive. The perception of taste and development of good eating habits at an early age could be influenced by teachers and teacher assistants' verbal and non-verbal communication.

Conclusion. Salt reduction does not significantly affect the rating of satisfaction with the tested product. Educational personnel must be aware of their decisive influence on children's perception of new and less salty products. Such an approach could represent a basis for creating children's eating habits, which will be of particular importance later in their lives. The findings may possibly result in an update of the national nutrition policy.

IZVLEČEK

Ključne besede:

predšolski otroci,
hedonska ocena,
zmanjševanje slanosti

Namen. Namen raziskave je bil opredeliti možnost neopaznega zmanjšanja vnosa soli s kruhom kot osnovnim živilom v prehrani predšolskih otrok. S študijo smo želeli ugotoviti odzive otrok na manj slan kruh in opredeliti vlogo vzgojnega osebja pri otrokovem sprejemanju prehranskih novosti.

Metode. Na primeru kruha smo s pomočjo hedonskega ocenjevanja raziskovali zaznavanje slanega okusa ter odzive predšolskih otrok na zmanjšanje slanosti. V raziskavi smo uporabili kombinacijo kvantitativne in kvalitativne analize podatkov, pridobljenih s študijo primera skupine, ki je štela 22 predšolskih otrok in 66 članov vzgojnega osebja. S pomočjo vprašalnika odprtega tipa smo proučevali opažanje vzgojnega osebja o vplivu vrstnikov ter verbalnega in neverbalnega sporočanja vzgojnega osebja na otrokovo sprejemanje novega prehranskega izdelka.

Rezultati. Otrokom smo ponudili kruh običajne slanosti ter kruh s 30- in 50-odstotno zmanjšano vsebnostjo soli glede na izvorno recepturo. Rezultati so pokazali, da otroci zmanjšanja okusa slanosti za 30%, torej na 70% izhodiščne vrednosti, večinoma ne zaznajo. Zmanjšanje slanosti na 50% so otroci zaznali, vendar so ponujene različne vrste kruha kljub spremenjenemu okusu dobro sprejeli in niso nobenega vzorca ocenili kot nesprejemljivega. Iz rezultatov ankete vzgojnega osebja lahko zaključimo, da osebje lahko moderira izražanje vrstnikov v skupini do določenega živila ter s svojo verbalno in neverbalno komunikacijo vpliva na oblikovanje dobrih prehranskih navad v zgodnjem otroštvu.

Zaključek. Manj slan kruh je bil dobro sprejet, zmanjšanja slanosti otroci večinoma niso zaznali, razlike v ocenah niso statistično značilne. Vzgojno osebje se mora zavedati svojega odločilnega vpliva na otrokovo percepcijo novih in manj slanih izdelkov. Tak pristop k zmanjševanju vnosa soli bi lahko bil osnova za oblikovanje prehranskih navad otrok, ki so še zlasti pomembne v poznejših starostnih obdobjih. Ugotovitve bi lahko pripomogle k nadgradnji nacionalne prehranske politike.

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1 INTRODUCTION

A carefully chosen diet along with physical activity is one of the key factors affecting children's health and well-being. Children's eating habits are established in the preschool period. This process is affected through family eating habits as well as preschool nutrition in kindergartens, where children usually spend most of their days and consume most of their daily meals. The concern for the quality of food and eating habits in preschool is therefore extremely important for the development and formation of eating habits later in life. Children learn about food through the direct experience of eating and by observing the eating behaviours of others. Children's eating patterns develop during early social interactions (1). When children go outside their familiar environments, they are influenced by adults and other role models, such as educational personnel in kindergartens.

When planning meals for children and youth in preschools, schools and other educational care centres, guidelines (2) which provide recommendations for creating menus for children from the age of one are followed. Practical examples are also presented in healthy eating menus provided under the heading Practice (3). When developing children's eating habits, we must take into account different factors, such as children's age, geographical locations of the places where they live, and the resulting characteristics of nutrition, eating habits from the immediate environment (family) and children's wider environment (preschool, school). Finally, children's diet is also influenced by religious principles and dietary restrictions due to health problems.

The legal basis for the provision of adequate healthy food is defined in legislation. The ordering of food for adequate meals in public institutions is determined by a public procurement procedure, a part of which focuses on organic and local products (4). The development of appropriate dietary habits in early childhood represents an investment in behaviour during adolescence and adulthood. Appropriate consumption patterns and physical activity prevent chronic non-communicable diseases; therefore, the system of mass caterers has to aim for the creation of positive approaches to a healthy life.

A large proportion of salt is frequently consumed by eating bread as a staple food. This is the reason why the public health policy focuses on bread as a means of salt intake reduction in the daily diet. The excessive intake of salt as a public health problem is mentioned in the context of preventing chronic non-communicable diseases, mainly cardiovascular diseases. The excessive intake of sodium is a risk factor for hypertension, which is also a cause of cardiovascular diseases and stroke. Studies also suggest a link between excessive salt intake and gastric cancer, osteoporosis, asthma, kidney stones and type 2 diabetes (5).

The experience of countries that have introduced systematic salt intake reduction in the population's diet shows that a systematic and gradual reduction of the consumption of salt is needed. Cooperation with the food processing industry and mass catering providers must also be established, with awareness-raising activities for the population carried out simultaneously (5). According to World Health Organization (WHO) guidelines, the population of Slovenia exceeds the maximum recommended daily salt intake in their diets - adults by 150%, adolescents by 100% and children by 67%. WHO guidelines are already exceeded when consuming between 5-6 g of salt per day in staple foods (5, 6).

The National Institute of Public Health of the Republic of Slovenia carried out a national survey in 2005 and 2007, on the salt content of bread and bakery products, which was repeated in 2009/10. Samples of large producers of bread from Slovenia were analysed with the research showing that the samples contained excessive amounts of the recommended target values of salt content. Whereas white, mixed, brown, rye and wholemeal bread contained an average salt content of 1.4 g/100 g, semi-white bread contained 1.2 g/100 g of salt content (7).

In 2012, the WHO published guidelines on sodium intake for adults and children. In Slovenia, the National Action Plan on reduced salt intake in the diet of people in Slovenia, for the period 2010-2020, provides recommendations regarding the consumption of sodium (7). The following recommendations were set by the WHO: a reduction in sodium intake to reduce blood pressure and risk of cardiovascular disease, stroke and coronary heart disease in adults to less than 2 g/day, which represents 5 g salt/day. For children, the value is adjusted according to the energy requirements of children relative to those of adults (8).

Scholars mention several different approaches to daily salt intake reductions. One of the approaches is 'gradual reduction without the consumer's knowledge', which refers to the observation that people in general are unable to determine the differences between two substances in which the difference in salt content is about 10% (described as 'Just Noticeable'). However, the ratio of the concentration not perceptible to the consumer is different for different foods or different preparation techniques. A 25% reduction of salt intake in bread without affecting the participants' perception was reported (9), but with the remark that all manufacturers should change the preparation technology.

Due to genetic predisposition, people prefer sweet and salty tastes. This preference is an unlearned, reflexive reaction. The majority of children prefer high-energy-dense foods to low-energy-dense ones. Infants (under 4 months) showed neither a favourable nor a dismissive attitude towards saltiness. However, infants at the age of

4 months start expressing a preference for salty tastes. In early childhood, the preference intensifies, so that children prefer saltiness more than adults, a pattern that is comparable to the sweet preference. Furthermore, the degree of salt concentration that children develop in childhood determines the level of preferred salt concentration in adulthood (1).

Whether a food is liked or disliked is an important determinant of food intake, especially among children. Salt contributes to the taste of foods and makes them more enjoyable (10). Salt level generally has a positive impact on the intake of the target foods (11, 12). Research found that 4-month-old infants identified and selected salted and not plain water, which indicates their salt taste perception mechanism, and 6-month-old infants who were fed salty starchy table food retained their tendency towards salty foods later in childhood (13). Results of the research showed that children aged 4 or more prefer salty foods to unsalted ones.

Various studies have shown that after consuming food with reduced salt content for a certain period of time (up to twelve weeks), the preferred level of salt in food is lowered to such a level that foods with high salt content become unpleasant for the subjects (14). Results of a recent research provide the evidence that promoting responsive feeding practices can alter the development of eating behaviour, sleep patterns and early self-regulatory skills, as well as reduce early obesity risk (15).

Studies also confirm that salt taste preference is formed in early childhood. Early experiences also affect food behaviour later in life, which should be considered when planning salt reduction initiatives (16, 17).

The aim of the research was to determine how children respond to the new less salty taste of bread and how they adopt it. The survey among educational personnel was carried out to define the role of teachers and teacher assistants in introducing novelties into children's nutrition. The aim was to explore educational personnel's opinions regarding their own influence and peer influences on children's perception of a food product.

2 MATERIALS AND METHODS

The survey was divided into phases. In the first phase, children and educational personnel evaluated different types of bread – rye, white, semi-white, brown, whole grain and oat bread, prepared with standard salt contents. The salt content in the final product was 1.4 g of NaCl/100 g, which is the amount that is contained in the commercial bread on the Slovenian market. The salt content of the bread was reduced by 70% and 50% compared to the standard bread, and it was tested using the same procedure. The bread samples were baked in the local

bakery Mlinotest Kruh Koper. The bread was prepared by slicing it into 1 cm wide pieces 8 hours after baking. One bread sample per day was evaluated. The ratio of volume/weight determined the structure of bread. Oat, brown and rye bread had a compact structure, while white, semi white and wholegrain bread had a soft structure. Children were given an additional piece of bread to eat before their regular meal, which consisted of the usual bread with cheese spread. They were encouraged to pay attention to the taste, smell, texture, and to remember their feelings while eating the bread. After the meal, children evaluated their opinions regarding the bread by using an emotional facial expression.

2.1 Subjects

Preschool children were recruited from the kindergarten Vrtec Koper, located in the town of Koper. A group of 22 children aged between 4 and 5 years, and 66 teachers and teacher assistants of all age groups of children aged between 1 and 5 years participated in the research. The study was performed between February and June 2015. The average length of service of educational personnel was 16.6 years, with 73% of the teachers and assistants possessing more than 5 years of experience in working with children.

2.2 Methods

The survey method was adapted to the age of the children. We took into account that sensory or consumer tests for children should respect the range of sensory and cognitive abilities of children. As described in previous studies (18), the hedonic assessment method using three emotional facial expressions is suitable for children at this age. The method applied is described by Chen et al. (19). A scale of hedonic evaluation was used to interview the children using the images of three emotional facial expressions: a smiling face ☺ - 'tasty, I like it'; indifferent face 😐 - 'acceptable, I do not like it a lot, but it is still quite good'; sad face ☹ - 'less tasty, I do not like it'. A mixed questionnaire with open-ended and closed-ended questions was prepared for the survey to be given out to educational personnel. Closed-ended questions are shown in Tables 3 and 4. Two open-ended questions were given to educational personnel. Open-ended questions were answered with a descriptive response, with which teachers had to state their observations and opinions regarding their own and peers' role in the creation of children's eating habits.

2.3 Data Analyses

Statistical analysis of the results was evaluated using the Fisher exact probability test. It yields a probability value p , defined as the probability of the observed array of cell frequencies, plus the sum of the probabilities

of all other cell-frequency arrays that are smaller than the probability of the observed array. We considered statistically significant the results with p -value <0.05 .

3 RESULTS

In the first part of the survey, the participants evaluated bread with standard salt content, which is also included on the regular children's menu, while the educational personnel evaluated breads with standard salt content in the same way as the children; the results are shown in Table 1.

Table 1. Hedonic evaluation of bread with normal salt content by children and educational personnel.

TYPES OF BREAD 100% salt content		😊		😐		☹️		p-value
		n	%	n	%	n	%	
wholegrain	children	15	100.0	0	0.0	0	0.0	0.2776
	personnel	54	81.8	11	16.7	1	1.5	
white	children	15	100.0	0	0.0	0	0.0	0.0270
	personnel	45	68.2	14	21.2	7	10.6	
semi-white	children	14	93.3	1	6.7	0	0.0	0.1918
	personnel	45	68.2	17	25.8	4	6.1	
oat	children	13	76.5	4	23.5	0	0.0	0.7250
	personnel	43	65.2	21	31.8	2	3.0	
rye	children	13	86.7	2	13.3	0	0.0	0.5571
	personnel	46	69.7	18	27.3	2	3.0	
brown	children	13	86.7	2	13.3	0	0.0	0.2772
	personnel	42	63.6	21	31.8	3	4.5	

More than 60% of the children evaluated all the bread types as tasty. Not many of the bread types were evaluated as acceptable, with semi-bread evaluated as acceptable only once, while wholegrain and white bread did not receive any less tasty assessments. None of the bread types was evaluated by children as less tasty. The results show that the educational personnel prefer bread with a definite taste (oat, brown), compact structure (rye) and semi-white bread. The differences among children and personnel are not statistically significant except with regard to white bread. The educational personnel did not

perceive white bread to be as tasty as children did, which indicates a p -value which is below 0.05, the reason being that the educational personnel felt that the white bread compared to other types, had a less definite taste, while white bread has a soft structure which children like. In the second part of the survey, children were presented with bread which had a 70% and 50% lower salt content compared to the standard recipe. The results are shown in Table 2. Satisfaction with bread, despite the reduced salt content, is high and comparable with standard salty bread.

Table 2. Hedonic evaluation of different types of bread and salt content by children.

TYPES OF BREAD	Salt content	😊		😐		☹️		p-value
		n	%	n	%	n	%	
wholegrain	100	15	100.0	0	0.0	0	0.0	0.1060
	70	15	100.0	0	0.0	0	0.0	
	50	13	86.7	2	13.3	0	0.0	
white	100	15	100.0	0	0.0	0	0.0	0.6442
	70	14	93.3	1	6.7	0	0.0	
	50	14	87.5	2	12.5	0	0.0	
semi-white	100	14	93.3	1	6.7	0	0.0	0.8370
	70	14	87.5	2	12.5	0	0.0	
	50	9	81.8	2	18.2	0	0.0	
oat	100	13	76.5	4	23.5	0	0.0	0.8982
	70	12	85.7	2	14.3	0	0.0	
	50	13	81.3	3	18.8	0	0.0	
rye	100	13	86.7	2	13.3	0	0.0	0.7944
	70	12	80.0	3	20.0	0	0.0	
	50	10	76.9	3	23.1	0	0.0	
brown	100	13	86.7	2	13.3	0	0.0	0.3886
	70	12	80.0	1	6.7	2	13.3	
	50	11	100.0	0	0.0	0	0.0	

The results show that children generally did not detect salt reduction or they did not describe it as disturbing. Children who evaluated breads using an indifferent emotional facial expression did not associate those breads with the concept of 'less salty'. They just explained what they wanted to say about the bread they ate. When the salt content was 50% of the standard content, educational personnel noted that children observed a change in taste, and despite the difference in taste, evaluated breads as tasty. However, fewer types of bread were described as tasty compared to the bread with 70% salt content. The assessment of 'less tasty' was not given to any of the breads. The differences in perception of any type of bread with varied salt content were statistically non-significant.

Educational personnel spend a lot of time with children in the active part of every day. They monitor their behaviour continuously during each meal, and they observe children's reactions to food. This gives staff sufficient knowledge and experience to assess how certain characteristics of bread impact children's perception and acceptability of a particular product. Table 3 shows observations of educational personnel regarding the importance of some specific characteristics of bread.

Table 3. Observations of educational personnel regarding the importance of specific characteristics for children's acceptance of bread.

	important		less important	
	n	%	n	%
taste	65	98.5	1	1.5
appearance	60	90.9	6	9.1
colour	55	83.3	11	16.7
smell	43	65.2	23	34.8
texture	41	62.1	25	37.9

The results show that three characteristics were assessed as the most important – characteristics that also form the first impression of a food product, namely taste, appearance and colour. However, bread is a very complex food from the visual and organoleptic point of view, and it is difficult to define correlations among children's answers as shown in Table 1, and observations of educational personnel as defined in Table 3.

Children imitate each other, therefore peer influence is certainly present when children are eating or talking about food. Observations of the educational personnel regarding peer influence and the effect of verbal and nonverbal communication of the educational personnel on the children's acceptance of food products are given in Table 4. Two open-end questions were posed – the first to evaluate peer influence and the second to evaluate the effect of educational personnel's verbal and nonverbal communication on children's acceptance of food products. Qualitative answers are shown in the table below.

Table 4. Observations of educational personnel regarding peer influence, and the effect of verbal and nonverbal communication of educational personnel on children's acceptance of food products.

	n	%
Peer influence		
strong influence	42	63.6
mild influence	15	22.7
no influence	9	13.6
Educational personnel influence		
strong influence	52	78.8
mild influence	8	12.1
no influence	6	9.1

Peer influence is important; its negative influence can be mitigated by educational personnel. Two open-end questions were asked, the first one to evaluate peer influence and the second one to evaluate the effect educational personnel's verbal and nonverbal communication had on children's acceptance of food products. The teachers stated the following observations:

- Peer influence is less visible in toddlers;
- influence varies according to the age of children;
- children taste a meal if they see others eating it, or they reject it when other children do the same;
- children imitate each other, therefore peer influence is certainly present;
- children are not under so much peer influence when in a guided group. However, personnel must be careful when talking about a specific meal;
- educational personnel have to reduce negative peer influence and, as an example, influence children's behaviour during meals.

Educational personnel's opinions regarding the importance of their role in persuading children to accept some foods or food products show that they are aware of the educational importance of kindergarten meals. The teachers stated the following observations:

- Children can sense educational personnel's reaction to a meal only by observing their facial expressions. If the opinion is negative, it reflects in the whole group;
- teachers and teacher assistants are role models for children;
- verbal and non-verbal communication is very important. Educational personnel must try all the food that is offered to children and must approve it even if they do not like it;
- educational personnel must present food to children in an appealing way, so that they want to taste it;
- educational personnel's appropriate attitude to food and encouragement can help a lot, inducing children to try the food, and be proud of themselves if they are also praised;
- it is important to convince children to at least try the food/product.

The results of the closed-ended questionnaire indicate that 78% of the educational personnel attach strong importance to their educational role in eating habits. The analysis of the open-ended responses, which encompass the experience of working with children, shows that educational personnel can affect children's perception of food.

4 DISCUSSION

The majority of children in Slovenia (92%) aged between 3 and 5 years attend kindergartens; however, the percentage of children aged between 1 and 5 years is lower, comprising only 77% (20). This means that children experience nutrition in both domestic and kindergarten environments. Children's responses to bread with unreduced standard salt content show they prefer white, semi-white and wholegrain bread, perhaps because of its soft structure. Brown, rye and oat bread were described as tasty (with a happy emotional facial expression); however, the percentage of breads evaluated with a lower mark was slightly higher. Preschool children primarily notice physical characteristics, such as colour, shape and structure in forming an opinion about certain foods (14). None of the children marked any of the breads as less tasty. There is no statistical difference in the evaluation of standard salted bread types between the children and educational personnel, except for white bread where the p-value is lower than 0.05.

We wanted to determine whether children find the bread with reduced salt content different enough to assess it as worse than the bread with normal salt content. Children were not previously told to pay attention to the saltiness of the product. They evaluated the product as a whole. Using emotional faces, they only explained what they wanted to say about the bread they were eating. Despite

the limitations of the hedonic evaluation, the results give us a vital answer – children like bread with reduced salt content. The statistical analysis of data using the Fisher exact probability test confirmed that evaluations of low-salt bread do not show deviations from the normal ratings of the same type of bread. These findings partially correspond to the results of the study by Girgis et al. (9), which showed that a 25% salt reduction can be made without being noticed. However, the results of our study indicate that children also accept breads with only 50% salt content, although results of some previous studies suggest that children prefer salty foods to unsalted ones (12). Children did not associate those pieces of bread with the concept of 'less salty'.

The environment children live in, in particular persons they come in contact with, is also important in formulating children's eating habits and influencing children's acceptance of specific tastes. The effectiveness of a child's role model in food preferences depends on the relationship between the child and the role model. A role model is a person who serves as an example by influencing others. For many children, the most important role models are their parents and caregivers. Children look up to different role models in order to help shape their behaviour in school, their relationships, or when making difficult decisions. Children also look up to other relatives, teachers and peers. Important role models for preschool children are older people or celebrities, and other characters that children admire. These people are more effective role models than unknown people (11). Peers in kindergarten play an important role in shaping children's eating habits. It is not uncommon for children to eat certain types of food that they initially decline at home. Children can also reject dishes simply because they are sitting next to their peers eating the meal with pleasure (21). Other surveys stress the influence of the environment outside the kindergarten; however, the results of this survey and its qualitative answers indicate that educational personnel have a significant impact on children's preference for a specific product. This influence can help reduce the salt intake in the daily diet of children and also adjust children to a lower salt diet later in life.

5 CONCLUSIONS

We found that salt reduction does not affect the rating of satisfaction with the offered product significantly. This was a step towards reducing salt intake in the daily diet of children, and adapting children to less salty dishes.

The environment outside the kindergarten has an important impact on children. The role of adults, parents and teachers is to help children develop healthy eating habits. We can conclude that educational personnel are

aware of their important educational role in child-feeding activities, and that they have a significant influence on children's preference of a specific product.

The success of the salt reduction project at the national level definitely depends on the macro-environment. Continuous education of all people involved regarding the importance of salt intake reduction in the daily diet and its effects on human health is necessary, the most important being educational personnel on one hand, and parents on the other.

CONFLICTS OF INTEREST

The authors declare that no conflicts of interest exist.

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ETHICAL APPROVAL

All the data analysed in this study were collected at the Vrtec Koper kindergarten, without collecting any information regarding the identity of individuals. Parents gave permission for their children's participation in the study. The study was conducted in accordance with the International Code of Medical Ethics of the World Medical Association (Declaration of Helsinki).

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ANTENATAL CHARACTERISTICS OF ROMA FEMALE POPULATION IN VIROVITICA-PODRAVINA COUNTY, CROATIA

ANTENATALNE ZNAČILNOSTI POPULACIJE ROMSKIH ŽENSK V REGIJI VIROVITICA-PODRAVJE NA HRVAŠKEM

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ABSTRACT

Introduction. This study reports about antenatal characteristics of Roma minority population. The study was designed to investigate data about health behaviours known to be associated with reproductive outcomes of Roma women that have very good living conditions and relatively high resource availability.

Keywords:

antenatal characteristics, Roma women, Croatia

Methods. A retrospective study included 204 Roma and 408 non-Roma hospitalised singleton births that occurred in the Maternity Ward of the General Hospital Virovitica in the period from 1991 to 2010. Data about women's age, marital status, smoking, reproductive health (abortions, delivery), antenatal care, perinatal complications and gestational age were taken from hospital records and analysed.

Results. Roma women were averagely more than three years younger than non-Roma women, only 10.8% were married. Smoking was more frequent. The average number of births of Roma and non-Roma women was similar, averagely two children per woman. The rate of induced abortions in the Roma women was higher, while the frequency of spontaneous abortions was equal. Inadequate antenatal care of Roma women was associated with two times higher incidence of perinatal complications. A higher frequency of deliveries at home without professional assistance in Roma pregnancy resulted in lower perinatal outcomes. It was confirmed that Roma mothers give birth earlier (38+6 vs. 39+4 weeks) and have a higher incidence of premature births (9.3% vs. 2.2%).

Conclusions. In the comparison of antenatal parameters between the two researched groups, poorer prenatal outcomes in the Roma population were found, despite full integration and considerable improvement in living standards of this ethnic Roma population.

IZVLEČEK

Namen. Raziskava prikazuje antenatalne značilnosti romske manjšinske populacije v hrvaški regiji Virovitica-Podravje. Analizira podatke o zdravstvenem stanju, povezanem z reproduktivnimi značilnostmi romskih žensk, ki živijo v relativno dobrih življenjskih razmerah.

Ključne besede:

antenatalne značilnosti, romske ženske, Hrvaška

Metode. V retrospektivno raziskavo so bile vključene 204 romske ženske ter 408 neromskih žensk, ki so rodile v porodnišnici Splošne bolnišnice Virovitica v obdobju od leta 1991 do leta 2010. Iz zgodovine bolezni porodnic so zbrani podatki o starosti žensk, njihovem zakonskem stanju, kajenju, reprodukcijskih značilnostih (splavi, porodi), antenatalni skrbi, perinatalnih zapletih in gestacijski dobi žensk.

Rezultati. Romske ženske so, ko rodijo, v povprečju več kot tri leta mlajše od neromskih žensk, le 10,8% romskih žensk je poročenih. Kajenje kot del tradicionalnega romskega življenja je pri romskih ženskah znatno pogostejše. Število porodov v obeh skupinah je podobno: vsaka ženska rodi povprečno dvakrat. Pogostost namernih splavov je pri romskih ženskah višja, medtem ko je pogostost spontanih splavov v obeh skupinah enaka. Neustrezna antenatalna skrb romskih žensk je povezana z dvakrat večjo pogostostjo perinatalnih zapletov. Pogostejše rojevanje romskih žensk doma, brez strokovne pomoči, prinaša slabše perinatalne rezultate. Potrjeno je, da romske ženske rojevajo prej (38+6 proti 39+4 tednov). Pri romskih ženskah je porod prezgoden v 9,3%, pri neromskih pa v 2,2%.

Zaključek. Primerjava antenatalnih značilnosti preučevanih skupin žensk je pokazala slabši perinatalni rezultat pri romskih ženskah kljub popolni integraciji in dobrim življenjskim razmeram te etnične populacije.

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1 INTRODUCTION

The Roma people are a widely dispersed transnational ethnic minority of northern Indian origin, located in Central and Eastern Europe. Throughout their history and migration the Roma have been politically, economically and culturally marginalized, ethnically stigmatized and discriminated against (1, 2). The Roma migrating in the area of today's Croatia settled down more than six centuries ago (3). The Roma represent a national minority in Croatia, the exact size of which is uncertain. The census of 2011 revealed that 9463 (0.4% of the total population of Croatia) claimed themselves to belong to the Roma nationality (4). However, estimates suggest a significantly larger number of the Roma in Croatia, between 30 000 - 40 000, or up to between 60 000 - 150 000 persons (5).

Etnomimicry, as a result of assimilation pressure of the local population on Roma in Podravina, led to difficulty in determining their number. The census of 1991 revealed 59 Roma (6), while according to the 2001 census, there are only 4 persons declared as Roma in that area (7). The census of 2011 reported that 14 (0.02%) persons in the Virovitica-Podravina County declared themselves as Roma, of which 6 (0.06%) persons were from Pitomača (4). According to the Centre for Social Work, the real number of Roma in a relatively small area of Podravina can be estimated at 1 500, which is disproportionately in relation to the data from the Census (8).

A higher share of Roma is more likely to be occasionally employed in seasonal agricultural jobs, trading in consumer goods, or collecting and trading with secondary processed materials (9, 10). A specific case is the Virovitica-Podravina County, where the Roma population is natively inhabited. Successfully integrated and adapted to the new environment, the completely assimilated Roma group speaks Croatian language, has better economic position than other Roma in Croatia and is engaged in private business affairs; however, it has therefore lost its national identity (11, 12).

Although a growing number of publications have dealt with the health and social situation of Roma in recent years, published researches on reproductive health of the Roma are limited and difficult to access. Virtually all studies so far were of a small size and most were conducted in non-representative population samples. The largest number of published studies on Roma comes from Slovakia, Czech Republic, Hungary, Romania and Spain (13-17). There are several recent reports dealing with the Roma in Croatia, but they are fragmentary, sparse and incomplete, especially the ones of reproductive health and antenatal care (18-21). The available data suggests that the health of the Roma people is poorer than that of the majority of population (13-17). Similarly, to ethnic differences in Croatia and elsewhere in Central and Eastern Europe,

the contributions of different factors, such as poverty, abject housing conditions, low educational status, high unemployment rate, short life expectancy and long term problematic relations to the majority of population, are emphasized as the most important problems of the Roma population (18-21). Several reports indicate that abortions, lower levels of antenatal care, and more perinatal complications and premature births are more common in Roma than non-Roma population (14, 16, 19, 22, 23).

The objectives of this perinatal research are focused on further and more thorough identification of similarities and differences between this completely assimilated Roma population and non-Roma population in Virovitica-Podravina County, and on the improvement of their health conditions, particularly their perinatal events, associated with Roma pregnant women, both in Virovitica-Podravina County, as well as in the whole Croatia.

2 METHODS

A retrospective study was performed on deliveries at the Maternity Ward of the General Hospital Virovitica, Croatia, in the period of 20 years, from January 1991 to December 2010. The sample for this study included 612 deliveries, of which 204 were of Roma women and 408 of non-Roma women, the second ones being the control group with singleton pregnancies and gestational age from 28 to 43 weeks. Women for the control group were selected in a 2:1 ratio, which means that our research includes the first delivery by two non-Roma women: one that gave birth before and one that gave birth after the birth of each Roma woman included in the study.

Descriptive statistical parameters for women's age are presented in Table 1.

Table 1. Descriptive statistics for age structure of Roma and non-Roma women.

	Roma (n=204)	Non-Roma (n=408)	p-value
Maternal age (years; mean±SD)	23.12±5.59	26.23±5.79	<0.001
Maternal age group (years)			<0.001
≤19	29.4%	10.5%	
20-24	35.8%	35.8%	
25-29	22.1%	25.2%	
30-34	7.8%	17.2%	
≥35	4.9%	11.3%	
Adolescents (<18 years)	19.6%	4.7%	<0.001

Ethnicity was based on their usual residential address at which the Roma population lives (Pitomača, Kloštar Podravski, Kladare - Figure 1), as well as on their specific names (Radelić, Ivanović, Đanić, Šajn, Špoljarić). The accuracy of the data is confirmed via inspection of the birth register.

Gestational age was determined by the duration of amenorrhea, calculated on the basis of the use of Naegle's rule (24), to align dates of the last menstrual period with the corresponding expected dates of delivery that was confirmed or corrected by the fetal ultrasonic biometry during pregnancy. After delivery, the gestational age was estimated using the method of Farr (25).

The data on women's age, marital status, smoking, reproductive health (abortions, delivery), antenatal care, perinatal complications and gestational age were taken from hospital records.



Figure 1. A map of Croatia with the location of the Virovitica-Podravina County.

The data on socio-economic characteristics was not registered in hospital records, and it was not surveyed in this retrospective study.

Descriptive statistics was shown in absolute numbers and frequencies for the qualitative variables, and means and standard deviations for the quantitative ones. Differences in qualitative variables were tested using χ^2 -test and Mann-Whitney test, and differences in quantitative variables by t-test. All analyses were performed by IBM SPSS Statistics 19 package for Windows, with statistical significance set on $p < 0.05$.

3 RESULTS

In the investigated period, there were 19318 births, of which 204 (1.06%) occurred among Roma women.

Significant differences were found in the age of Roma and non-Roma women (Table 1). Roma women were, on average, more than three years younger than non-Roma women. The incidence of adolescent women was four times higher in the group of Roma women; moreover, Roma women predominated in the younger age groups. In the youngest age group (13-19 years), their share was three times larger, the frequency decreasing gradually with increased age class, and in the oldest age group (35-43 years), the share of Roma women was two times lower than the one of the non-Roma women.

Only 56 Roma women declared their marital status, of which 22 (10.8%) were married, significantly less than non-Roma women (95.8%).

Smoking during pregnancy was considerably more common for Roma women (26.5% vs. 16.3%).

Table 2. Reproductive characteristics of Roma and non-Roma women

	Roma (n=204)	Non-Roma (n=408)	p-value
Number of induced abortions (mean±SD)	0.36±0.90	0.11±0.43	<0.001
1	7.5%	5.1%	
2	5.5%	2.0%	<0.001
≥3	5.0%	0.7%	
Number of spontaneous abortions (mean±SD)	0.11±0.35	0.18±0.50	0.194
1	9.5%	10.0%	
2	1.0%	2.7%	0.302
≥3	0.0%	0.7%	
Sequence of births (mean±SD)	2.29±1.67	1.97±1.22	0.140
1st	41.2%	41.7%	
2nd	28.4%	36.3%	0.030
≥3rd	30.4%	22.0%	

While talking about perinatal parameters, one should mention reproductive characteristics of women. Table 2 shows differences of reproductive characteristics between Roma and non-Roma women. The rate of induced abortions in the Roma women was more than three times higher compared to non-Roma women. The frequency of women with one or more induced abortions was two times higher in the group of Roma women (17.9% vs. 7.8%), and this difference was significantly higher for women with three or more induced abortions. Hereby

presented results showed no differences in the frequency of spontaneous abortions between the studied groups.

One or more spontaneous abortions were more common for non-Roma women in relation to the Roma (10.4% vs. 14.0%), but the difference was not significant. The mean difference according to the ordinal number of deliveries between Roma and non-Roma women was not significant; in both groups, the average number of births was similar, meaning two children per woman. There is a marked dominance of nulliparous and secundiparous, more often among the non-Roma women, but with higher birth rates the frequency of Roma women in the group increased significantly. The frequency of Roma women with five or more births was higher than the one of non-Roma women (10.3% vs. 3.9%).

Table 3. The distribution of antenatal visits of Roma and non-Roma women.

	Roma (n=204)	Non-Roma (n=408)	p-value
Number of antenatal visits (mean±SD)	4.01±3.29	6.25±2.65	<0.001
0	18.4%	2.2%	
1-2	20.4%	6.9%	
3-5	29.4%	27.9%	<0.001
6-8	20.4%	45.6%	
≥9 (optimal)	11.4%	17.4%	

The distribution of antenatal visits is presented in Table 3. According to the number of antenatal visits, non-Roma women are in a better position, as they visit the gynaecologist during pregnancy averagely more than six times, while Roma women visit the gynaecologist during pregnancy averagely only four times. The difference was also significant in the distribution of the number of antenatal visits grouped into categories. Almost every fifth Roma woman during pregnancy did not make any gynaecological visit or was not optimally examined. Their optimal number of gynaecological controls was approximately two times lower than the one of (significantly better controlled) non-Roma women.

The prevalence of perinatal complications in the group of Roma women was almost two times higher, as well as a large variety of certain types of complications (Table 4).

Table 4. Perinatal characteristics of Roma and non-Roma women.

	Roma (n=204)	Non-Roma (n=408)	p-value
Perinatal complications (mean±SD)	1.05±0.96	0.63±0.75	<0.001
Narrow pelvis	19.1%	4.2%	<0.001
Fetopelvine disproportions	9.8%	4.2%	<0.001
Breech presentation	5.4%	1.5%	0.007
Urinary infections	7.4%	7.4%	0.042
Fetal asphyxia	10.8%	5.4%	0.020
Pathological cardiotocography	3.3%	0.6%	0.048
Deliveries at home	6.5%	0.0%	<0.001
Duration of labor (hours; mean±SD)	6.08±3.43	6.53±3.56	0.140
Gestational age (weeks; mean±SD)	38.88±1.73	39.52±1.21	<0.001
Premature births	9.3%	2.2%	<0.001

The diagnosis of narrow pelvis was found to be five times more common in Roma women, which is linked to two times higher frequency of fetopelvine disproportions, and four times higher frequency of breech presentation. The incidence of urinary infections was two times higher, and fetal asphyxia (Apgar score of 0 to 6 at 1 minute) was also two times more frequent, as confirmed by a significantly higher frequency of pathological cardiotocography (late and prolonged deceleration, bradycardic and sinusoidal fetal heart rate) recordings in Roma women. The frequency of deliveries at home without a medical or midwifery professional assistance, which is for Roma women traditionally still high, should be pointed out.

The duration of labour in the Roma women was averagely half an hour shorter, but not significantly different in the studied groups. Roma women gave birth significantly earlier, and their gestational age was, on average, five days shorter compared to non-Roma (38+6 vs. 39+4 weeks). Premature births were more common for Roma women than for non-Roma. A significantly higher incidence of early premature birth of gestational age 28-34+6 weeks (2.5% vs. 0.2%), as well as late premature births of gestational age 35-36+6 weeks (6.9% vs. 2.0%) are found in Roma women. There was no difference in the

frequency of male and female newborns between Roma and non-Roma mothers. Roma mothers gave birth to male newborns (52.0%) more often than to female, while non-Roma women often gave birth to female (52.5%) newborns.

4 DISCUSSION

The aim of this study was to compare antenatal parameters of this completely assimilated Roma population with the majority of the population living in the same geographical area. Perinatal outcomes of the Roma pregnant women were poorer despite their full integration and a considerable improvement in living standards of this ethnic Roma population in Virovitica-Podravina County.

The reproductive health of the Roma population presents a major challenge to public health professionals, especially where they are a significant minority.

By virtue of the national program for Roma and participation in the Decade of Roma Inclusion 2005-2015, Croatia has chosen its strategic standpoint toward programs of social inclusion of Roma; in the health area, the focus is on raising health awareness and care in terms of safe motherhood, reproductive health, prenatal and pregnancy health care in Roma women, and family planning. Indicators that are being tracked are the number of antenatal visits per woman, the number and share of births accompanied with professional help, the number and share of women included in the education for family planning, the use of contraceptives and contraceptive methods, the rate of deliveries of Roma women under the age of 16, and the rate of abortions. Most of those indicators are only obtainable through special studies, while routinely monitored indicators do not satisfy quantitative needs. Another problem is Roma not stating their ethnic denomination. The data about the number of Roma in Croatia and their age-sex-structure was neither accessible nor collected during the past years, while the research was being conducted. Thus, this kind of data, on the state level, stays unknown (21).

There are other studies suggesting that perinatal outcomes and reproductive health were poor, and perinatal death rate among Roma women was higher than among non-Roma. More of the data provided in the article is incomplete and suggests that reporting may not have been entirely reliable. The exact number of Roma in Slovakia is also unclear (17). Results of Jarcuska et al. suggest that worse health among Roma compared with non-Roma in Slovakia is mediated by worse access to health services, apart from a large educational gap between Roma and non-Roma. Another important factor is cultural divergence regarding health belief and attitudes of Roma or their distrust of health care system arising from previous experiences (26). The main determinants of inequities in the health status of Roma population in Hungary, Bulgaria and Romania are

education and wealth. Authors suggest broad multisectoral policies to reduce poverty, improve housing and education, as well as specific health-related policies targeting Roma and other ethnic minorities (27). Socioeconomic status is a strong clue of health of people living in Roma settlements in Hungary (28). Although socio-economic factors were not investigated in this study, compared to other groups of Roma in Croatia, Roma population in Virovitica-Podravina County lives in very good conditions with relatively high resource availability (9, 10).

At the time when the national population becomes older and smaller, the birth rate of Roma population increases and exceeds the national average with a high proportion of younger children (23). Rasevic found increased fertility in less developed regions of Serbia and by women with lower education, especially in groups of Albanian, Muslim and Roma women (29). In contrast to Roma in this study, whose population is small, integrated and similar to the majority of non-Roma population, the Roma population in Međimurje county, Croatia, is numerous and more specific. A study on deliveries for the period from 1998 to 2006 reports about 1767 Roma infants, which makes an average of 15.7% of the total number of births in Međimurje with a rising frequency of their respective births from 12.0% to 18.4% (30). The indicators of the reproductive status reported by the Roma women reflect their traditional life-style, the existence of very young mothers and the multi-children family model (19).

Especially traditional are Roma marriages. Wedding is characterized by celebration and ritual, while registering of the marriage at a register office or church is not a rule. The Roma in Central Europe have maintained their traditions and culture and tend to marry other Roma (17). The phenomenon of endogamy of Roma, which was found generally in all of Roma women in this research, is determined with strict and often complicated rules. They are rarely married, in contrast to non-Roma women that are generally married. Traditional rules do not apply to all of the Roma population. Bereczkei and Dunbar report that in Hungary Roma women were supposed to engage in exogamous marriages; 2.8% of rural Roma women married Hungarian men and 26.7% of women in the urban Roma population did so. One reason why those exogamous marriages exist, in contrast to endogamous ones, might be the benefit of social status improvement and survival chances for the Roma children (31). Roma girls in Serbia were found to be at very high risk of being married as children; 50.4% of women from 20 to 24 years of age reported being first married before the age of 18, and 13.2% were first married before the age of 15. This is considerably higher than the rates among females of the same age in the general population (32). The Bayash Roma women in Croatia marry averagely at the age of 16.8 (19). Cook et al. in a systematic review reported about multiple studies of Roma and non-Roma disparities in prenatal care

and pregnancy outcomes (33). Roma women had their first pregnancy earlier than non-Roma women. A study of the sexual culture of Roma women in Bulgaria found that nearly half of pregnancies, where the mother's age is 13-16, were among Roma women (22). A high share of children in the Bayash Roma population in Croatia is characterised by the average birth rate of four children per woman. The rate is markedly higher in Medimurje, with more than five children per woman (19). Roma women in Serbia and Macedonia had an average of 2.5 children (34), while in Hungary, they had 3-13 children (35). In our research, regarding childbirth, one fifth of the Roma women were adolescents and averagely more than three years younger than non-Roma women. Roma women predominated in the younger age groups, but in both groups the average number of births was similar - two children per woman.

In addition, the rate of induced abortions in Roma women in our research was high, more frequent than in non-Roma women. Results showed no differences in the frequency of spontaneous abortions between the studied groups. In the Bayash Roma population in Croatia, the number of induced abortions is equal to the number of born infants. The mean number of induced abortions per Roma woman was higher than in the majority of population (19).

Smoking, as a part of traditional Roma life-style and one of perinatal risk factors is more frequent in Roma than in non-Roma mothers. According to Dejmek et al., in the Czech Republic, the habit of smoking was recorded in approximately 78% of Roma mothers, compared to 31% of non-Roma mothers (36). In the Bayash Roma population in Croatia, smoking was recorded in 69.4% of the examined women (20), as opposed to 26.6% in the general population (37). In our case, smoking during pregnancy is somewhat less often, but nevertheless, almost two times more frequent in Roma women than in non-Roma women.

There is a research study about the reproductive health of Roma women that was carried out in Slovenia. Numerous Roma people in the area of the Dolenjska region are situated and live in residential conditions that have improved only in the last decade. The progress with regard to the improvement of social circumstances, education and the accessibility of healthcare is noticeable. The weaknesses of reproductive health arise from poor health awareness and unhealthy lifestyle, the lack of participation in preventive programmes, the inappropriate use of healthcare services and the inappropriate approaches to providing healthcare services to Roma women. During pregnancy, young Roma women regularly come to the clinic for examinations, whereas after delivery, they visit a gynaecologist less frequently and rarely take part in preventive programmes (38).

Good antenatal care is an important factor for a successful outcome of pregnancy. According to The Plan and Program

of the Health Care, there are standards of ≥ 9 prenatal examinations during pregnancy, and the optimal number of ultrasound examinations within antenatal care that should provide a successful perinatal outcome (39). One of the problems of health care of Roma is non-realization of the right to free health care on the part of the Roma population. According to UNICEF, perinatal care of Roma pregnant women is poor; in Macedonia, there were 38% of women without examining during pregnancy, and in Kosovo, as much as 60%, with a high percentage of births at home without a medical professional assistance (40). Newer data indicates that 9% of Roma women in Serbia, compared to 1% in the overall population, and 21% in Macedonia, compared to 2% in the overall population, did not attend any prenatal care visits (34). Our data suggests that a high percentage of Roma women did not have any prenatal care visits, only one third of Roma women had more than 5 visits, in comparison to two thirds of non-Roma women with more than 5 visits during pregnancy.

Inadequate antenatal care of Roma mothers included in our research is associated with a higher incidence of perinatal complications. More frequent abnormal cardiotocographic records in Roma mothers from this research are associated with two times higher fetal asphyxia and neonatal complications as well as the high incidence of deliveries at home without a medical or midwifery assistance, which has resulted in poor perinatal outcomes. The incidence of adolescent Roma mothers in our case is high, and pregnancy and childbirth can be associated with perinatal complications. Authors from Canada found a higher incidence of neonatal complications and an increased incidence of fetal asphyxia in adolescent mothers, which they attribute to a lower socioeconomic status, inadequate prenatal care and inadequate gestational weight gain in adolescent pregnant women (41).

The duration of pregnancy is an important factor that has an impact on the size of the infant and neonatal complications. Roma women in our research gave birth significantly earlier, and their gestational age was averagely five days shorter, compared to non-Roma women. The data from Bulgaria, Hungary, Czech Republic and Slovakia indicates that low birth weight and premature births are more common in Roma than in non-Roma women (14, 22, 42). In Hungary, the incidence of premature birth was higher among Roma women (9.9%) than among non-Roma women (7.1%), and the gestational age of Roma newborns was lower (0.4 weeks) than that of non-Roma newborns (42). We also found a similar incidence of preterm births, which are significantly more frequent in Roma women than in non-Roma women, especially late premature births of gestational age 35-36+6 weeks.

In our case, the sex ratio at birth shows a male surplus, but the difference was not significant between Roma and

non-Roma women. Similar results were found in studies of Hungarian (31) and Czech Roma mothers (14).

The present study suffers the limitation that it is not representative of the overall Croatian Roma population, and it did not include those Roma that are not assimilated to the majority of population to a certain degree. Given the unwillingness of many people to self-define their ethnicity as Roma, this is a constraint that will be very difficult to overcome. Several limitations of the study should be considered when interpreting the results. More detailed data of a family environment, economic and material conditions as well as maternal education would provide a more complete picture for the explanation of ethnic differences of perinatal indicators. In addition, mothers may have misreported some of the information.

Roma are a very heterogeneous group in terms of living conditions and levels of integration, and results can be generalized only to the Roma population living in Roma settlements. Further research into the health of Roma people is needed, with a particular emphasis on the reproductive health and interventions that would improve their health. It would be necessary to conduct research at the level of the entire country, which would include all Croatian regions where Roma people live. Such a national research study would enable the comparison of Roma women's reproductive health between individual regions, and represent guidelines for research on these problems in other countries with Roma populations or other ethnic minorities.

6 CONCLUSIONS

Comprehensive and comparative studies of the health status and perinatal parameters of Roma in Croatia are rare and fragmentary. The objectives of this perinatal research are focused on the reproductive health of Roma population in Virovitica-Posravina County, especially in relation to perinatal events of Roma pregnant women, mothers and newborns. In the comparison of antenatal parameters between the two researched groups, despite full integration and considerable improvement in living standards of this ethnic Roma population, poorer prenatal outcome was found in the Roma population.

CONFLICTS OF INTEREST

The authors declared that they have no financial, professional or personal conflicting interests related to this article.

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ETHICAL APPROVAL

The research protocol was approved by the Commission of the General Hospital Virovitica for Medical Ethics.

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THE INFLUENCE OF PARENTAL EDUCATION AND OTHER SOCIO-ECONOMIC FACTORS ON CHILD CAR SEAT USE

VPLIV IZOBRAZBE STARŠEV IN DRUGIH SOCIALNO-EKONOMSKIH DEJAVNIKOV NA UPORABO OTROŠKEGA AVTOMOBILSKEGA SEDEŽA

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ABSTRACT

Keywords:

child restraint systems, educational status, socioeconomic factors, preschool children

Introduction. The behaviour of parents in ensuring car passenger safety for their children is associated with socio-economic (SE) status of the family; however, the influence of parental education has rarely been researched and the findings are contradictory. The aim of the study was to clarify whether parental education influences the use of a child car seat during short rides.

Methods. A cross-sectional survey was carried out in outpatient clinics for children's healthcare across Slovenia. 904 parents of 3-year-old children participated in the study; the response rate was 95.9%. A self-administered questionnaire was used. A binary multiple logistic regression was applied to assess the association between parental unsafe behaviour as dependent variable, and education and other SE factors as independent variables.

Results. 14.6% of parents did not use a child car seat during short rides. Families where mother had low or college education had higher odds of the non-use of a child car seat than families where mother had a university education. Single-parent families and those who lived in areas with low or medium SE status also had higher odds of the non-use of a child car seat.

Conclusions. Low educational attainment influences parents' behaviour regarding the non-use of a child car seat. Low parental education is not the only risk factor since some highly educated parents also have high odds of unsafe behaviour. All parents should therefore be included in individually tailored safety counselling programmes. SE inequalities could be further reduced with provision of free child car seats for eligible families.

IZVLEČEK

Ključne besede:

sistemi za zadrževanje otrok, izobrazba, socialno-ekonomski dejavniki, predšolski otroci

Uvod. Vedenje staršev pri zagotavljanju varnosti otrok v avtomobilu je povezano s socialno-ekonomskim (S-E) položajem družine, vendar je bil vpliv izobrazbe staršev proučevan redko, ugotovitve pa so si nasprotujoče. Namen raziskave je bil razjasniti, ali izobrazba staršev vpliva na uporabo otroškega avtomobilskega sedeža.

Metode. Izvedena je bila presečna raziskava v ambulantah zdravstvenega varstva otrok po Sloveniji. Sodelovali so 904 starši triletnikov, odzivnost je bila 95,9-odstotna. Uporabljen je bil vprašalnik za samoizpolnjevanje. Za oceno povezanosti neuporabe otroškega avtomobilskega sedeža kot odvisne spremenljivke ter izobrazbe in drugih S-E dejavnikov kot neodvisnih spremenljivk je bila izvedena binarna multipla logistična regresija.

Rezultati. Starši niso uporabljali avtomobilskega sedeža na kratkih vožnjah v 14,6% primerov. Večje obete za neuporabo sedeža so imeli v družinah z nizko in višje (1. stopnja) izobraženo materjo v primerjavi z družinami z univerzitetno (2. stopnja) izobraženo materjo, pa tudi v enostarševskih družinah ter na območjih bivanja z nizkim in srednjim S-E položajem.

Zaključki. Nizka izobrazba staršev vpliva na njihovo odločitev, da bodo opustili uporabo otroškega avtomobilskega sedeža na kratkih vožnjah. Vendar nizka izobrazba ni edini dejavnik tveganja, saj imajo visoke obete za opustitev varnostnega ukrepa tudi nekateri visoko izobraženi starši. Zato bi bilo treba za vse starše uvesti individualno prilagojeno svetovanje o varnosti otrok v avtomobilu. Neenakosti, pogojene s S-E položajem, pa bi lahko dodatno zmanjšali z brezplačnimi otroškimi avtomobilskega sedeži za socialno šibke družine.

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1 INTRODUCTION

Injuries are the leading cause of death in children older than 1 year in Slovenia and other European countries, wherein preschool children are most vulnerable to traffic accidents (1). Despite the national mandatory child restraint use and scientific evidence that child safety car seat use is highly effective in reducing the risk of fatal and nonfatal injury during traffic collision (2, 3), in Slovenia, up to 20% of children younger than 12 years are not restrained (4).

High mortality and morbidity due to injuries are associated with poverty and material deprivation (5), which increase injury risks because children are exposed to a wider range of hazards due to poor safety of their living environment, while parents have less knowledge and time to implement safety measures and less means to buy safety devices (6). Until now, a relatively small number of studies was published on the relationship between parental safety practices and SE factors, such as low parental educational attainment, unemployment, a single-parent family, and living in poor areas. Some authors report that child safety car seat is used less frequently in families with low income (7, 8) and low parental educational attainment (9, 10), but most studies could not or did not try to prove the association with socio-economic (SE) factors (11-13). Very few studies analysed educational attainment in combination with other SE factors, despite the fact that it could influence parents' ability for injury prevention in children. Parents with higher educational levels are more aware of potential dangers, they can seek out better information on injury prevention in children, and they have better intellectual abilities, more knowledge and greater motivation for intervention (10). We would expect that parental education positively influences their implementation of safety measures, but the findings so far are contradictory. Some authors report that parents with higher education levels use the child safety car seat more often (7, 10, 14), while other studies show that the use of a child car seat is not significantly different in families with lower educated mother (8, 11, 12), or it is even more frequent (15).

The aim of our study was to clarify whether parental education influences the use of child car seat and to assess the extent of its importance compared to other socio-economic factors. A self-administered questionnaire on safety practices was used in a cross-sectional area probability study sample of parents. The findings will contribute to the development of new programmes in the field of safety promotion and reduction of children's health inequalities due to injuries.

2 METHODS

2.1 Study Design and Participants

An analytical cross-sectional survey was conducted in outpatient clinics for children's healthcare across Slovenia. The study population comprised parents who brought their children for routine well-child visits at the age of three years. The sample was selected by the method of stratified area probability proportionate to size sampling (16) with the choice of 41 clusters with 23 persons. The questionnaire was completed by 904 parents; the response rate was 95.9%. 37 questionnaires (4.1%) were rejected due to child's inadequate age, while 867 questionnaires were eligible for the analysis. Another 16 records were excluded from the final analysis, because families have not got a car. The average age of mothers was 33.0 years, while the average age of fathers was 35.7 years. Other socio-demographic characteristics of participant families are shown in Table 1.

Table 1. Socio-demographic characteristics of participant families.

Family characteristics	N	(%)
Mother's age (years)	847	
Less than 29		19.8
30-34		43.0
35 and more		37.2
Father's age (years)	841	
Less than 29		9.0
30-34		34.2
35-39		36.3
40 and more		20.5
Mother's education	849	
Vocational or less		15.5
Secondary		27.1
College		27.1
University		30.3
Father's education	842	
Vocational or less		29.0
Secondary		30.8
College		18.5
University		21.7
Child sequence	848	
First child		49.1
Second and following child		50.9
Number of children	848	
One child		27.8
Two or more		72.2
Gender of the child	850	
Male		51.4
Female		48.6

Family characteristics	N	(%)
Family type	848	
Both parents		75.0
Parents and relatives		22.1
Single-parent family		2.9
Material welfare of the family	844	
Poor		8.9
Medium		81.6
Good		9.5
Type of residence community	842	
Urban		38.7
Suburban		17.7
Rural		43.6
SE status of area of residence	850	
Poor		25.8
Medium		17.9
Good		56.3

2.2 Materials

A self-administered questionnaire was developed. Before starting data collection, 12 parents from one of the clinics participated in pilot testing. The final questionnaire was supplemented in accordance with the pilot testing findings and handed to 943 parents.

The questionnaire contained questions on safety practice and potential correlates. Safety practice regarding child car seat use was assessed with the following question: 'How often is your child fastened in a child car seat during 5- to 10-minute rides?' Answers were recorded to a dichotomous outcome (not using - never, less than half times, more than half times, using - always). Parents' behaviour was defined as unsafe in cases when parents did not use a child car seat on every short ride, because a child is only safe when the child car seat is used, which is required by law in Slovenia. Potential correlates of safety practice were: socio-economic status assessed with maternal and paternal educational attainment (vocational or less, secondary, college, university), family type, material welfare of the family (self-assessed as poor - they cannot or can barely cover the usual needs with family income, including social benefits; medium - they cover the usual needs and possibly save some money; good - they easily save a part of the income and make investments), SE status of area of residence (quintiles of income tax base per capita in the municipality were defined as bad - the 1st and 2nd group with the lowest income tax; medium - the 3rd group; good - the 4th and 5th group) and the type of the residence community (self-assessed).

Family and child's characteristics were defined with mother's age, father's age, gender of the child, child sequence, the number of children, parents' knowledge on children's injury prevention (poor - 1/3 of correct answers or less; good) and the source of information (reliable - books, medical staff; questionable - the Internet, magazines, TV; unreliable - friends, relatives, none). The motivational factors were defined on the basis of presumptions of Protection motivation theory (17). The four-point answer scale ('low' to 'very high') was used to measure parents' perception of their children's vulnerability, the severity of a child's injury in a potential accident, safety measure efficacy and self-efficacy. Social norms were measured with the perceived expectations of significant others regarding the importance of safe behaviour ('not so important' to 'very important').

2.3 Procedure

In 41 paediatric outpatient study sample clinics, nurses invited parents who brought their three-year-old children for routine well-child visits in May and June 2013 to participate in the study. Parents, who gave their written consent for the participation in the study, filled in the questionnaire by themselves in the waiting room, while waiting for their child's turn for a check-up. The data were gathered by self-administered questionnaires, accompanied by a cover letter, which explained the purposes of the study and why parents' cooperation is important. In case both parents accompanied the child, they only filled in one questionnaire. Parallel answers given by the father and mother of the same child were not requested. Parents sealed up the completed questionnaire in an enclosed envelope and put it in a special box in the nurse's office. The nurse opened the box only after the study data collection was over. In case parents did not wish to participate in the study, they marked the questionnaire accordingly and put it in the box. Parents were given full anonymity because the questionnaire did not include any personal data, which could identify them or their child. The participants did not receive any financial stimulation.

2.4. Data Analysis

Categorical variables were described with relative frequencies and continuous variables with mean ones. The association between unsafe behaviour as dependent variable and SE and other factors as independent variables was assessed using binary multiple logistic regression. Dummy variables were created for all observed independent variables in the analysis. The simple method was applied. Three models were fitted: SE factors (Model 1), adjusted for demographic factors (Model 2), and adjusted for demographic, motivational factors and social norms (Model 3). The Hosmer - Lemeshow test was used to perform the assessment of how well each model accounts

for the outcome. For the comparison of three models, the likelihood ratio test was used, wherein Model 1 was a special case of Model 2, and Model 2 was a special case of Model 3. Further analyses were applied to investigate potential interaction effects (effect modification) among individual SE factors and between SE factors and motivational factors / social norms.

P-value ≤ 0.05 was considered as statistically significant. SPSS statistical package for Windows Version 21.0 was used for the analysis.

3 RESULTS

14.6% of families did not always use a child car seat during short rides. In univariate analysis, families with mothers who had vocational, secondary and college education had significantly higher odds for unsafe behaviour regarding child car seat use compared to families with mothers with university education. The same applied for families with fathers who had vocational and secondary education compared to families with university-educated fathers, as well as for families living in areas with poor and medium SE status compared to families living in areas with good SE status. Other characteristics of participant families associated with unsafe behaviour are shown in Table 2.

After introducing multivariable analysis in Model 1, 2 and 3 (Table 3), the change in OR was substantial for several variables compared to univariate analysis. In Model 1, logistic regression analysis showed a significant association between the non-use of child car seat and vocational maternal education, college maternal education, and medium SE status of the area of residence. When the association between the outcome and SE factors was adjusted for demographic factors, motivational factors and social norms in Model 3, the association with single-parent family type and poor SE status of the area of residence became significant. We have tested potential interaction effects among individual SE factors, and between SE factors and motivational factors / social norms. There were no significant interactions; therefore, the change in ORs is likely to be attributed to confounding. Father's education, material welfare of the family and the type of residential community were not significantly associated with the outcome in none of these three models. Other family characteristics associated with unsafe behaviour are shown in Table 3.

Model 3 showed the best fit to the data of all three analysed models. The inclusion of demographic factors into Model 2 increased the fit of Model 2 compared to Model 1, and further inclusion of motivational factors and social norms into Model 3 increased the fit of Model 3 compared to Model 2 (Table 3).

Table 2. Estimates of the prevalence of the non-use of a child car seat ($N_{\text{tot}}=851$), and results of invariable analysis of the association between the non-use of a child car seat and family factors.

	N_{cat}	Not using a child car seat (%)	Univariable analysis	
			OR (95% C.I.)	P-value
Socio-economic factors				
Mother's education				
University	257	7.0	1.00	
College	230	18.7	3.05 (1.71-5.47)	p=0.000
Secondary	230	13.9	2.15 (1.17-3.94)	p=0.014
Vocational or less	132	23.5	4.08 (2.18-7.62)	p=0.000
Father's education				
University	183	8.2	1.00	
College	156	12.2	1.55 (0.76-3.17)	p=0.226
Secondary	259	16.2	2.17 (1.16-4.04)	p=0.015
Vocational or less	244	18.9	2.60 (1.40-4.83)	p=0.002
Material welfare of the family				
Good	80	11.3	1.00	
Medium	689	14.7	1.36 (0.66-2.80)	p=0.411
Poor	75	17.3	1.65 (0.66-4.13)	p=0.281
Family type				
Both parents	636	14.2	1.00	
Parents and relatives	187	15.0	1.07 (0.68-1.69)	p=0.778
Single-parent family	25	24.0	1.92 (0.75-4.93)	p=0.177
SE status of area of resid.				
Good	479	10.9	1.00	
Medium	152	22.4	2.37 (1.47-3.82)	p=0.000
Poor	219	17.4	1.72 (1.10-2.71)	p=0.018
Type of residence community				
Urban	326	13.5	1.00	
Suburban	149	12.1	0.88 (0.49-1.58)	p=0.671
Rural	367	16.3	1.25 (0.82-1.91)	p=0.295
Demographic factors				
Mother's age				
35 years and more	315	12.1	1.00	
30-34 years	364	14.0	1.19 (0.76-1.86)	p=0.454
do 29 years	168	20.2	1.85 (1.11-3.07)	p=0.017
Father's age				
40 years and more	172	15.7	1.00	
35-39 years	305	9.5	0.56 (0.32-0.99)	p=0.046
30-34 years	288	18.4	1.21 (0.73-2.01)	p=0.459
do 29 years	76	17.1	1.11 (0.54-2.29)	p=0.781
Child sequence				
First child	416	11.8	1.00	
Second or latter	432	17.4	1.57 (1.07-2.32)	p=0.022

	N _{cat}	Not using a child car seat (%)	Univariable analysis	
			OR (95% C.I.)	P-value
Number of children				
One child	236	14.1	1.00	
Two or more	612	14.7	1.02(0.67-1.57)	p=0.912
Gender of the child				
Female	413	14.3	1.00	
Male	437	14.9	1.05 (0.72-1.54)	p=0.808
Knowledge				
Good	369	12.5	1.00	
Poor	482	16.2	1.36 (0.92-2.01)	p=0.129
Information source				
Books, med. staff	371	12.9	1.00	
Internet, magazines, TV	272	17.6	1.43 (0.93-2.21)	p=0.102
None, friends, relatives	202	13.4	1.03 (0.62-1.71)	p=0.900
Motivational factors and social norms				
Child vulnerability				
High	607	14.2	1.00	
Low	236	15.3	1.09 (0.72-1.66)	p=0.687
Injury severity				
Severe	669	11.2	1.00	
Not severe	161	27.3	2.98 (1.95-4.54)	p=0.000
Safety measure efficacy				
Very effective	731	11.9	1.00	
Not very effective	114	30.7	3.28 (2.08-5.18)	p=0.000
Self-efficacy				
Very self-effective	282	7.8	1.00	
Not very self-effective	565	17.9	2.57 (1.58-4.18)	p=0.000
Social norms				
Very important	637	11.6	1.00	
Not very important	203	23.2	2.29 (1.53-3.44)	p=0.000

N_{tot} = total number of observations;

N_{cat} = number of parents within the category

Table 3. Logistic regression models with odds ratios (OR) and 95% confidence intervals (95% C.I.) of the non-use of a child car seat according to socio-economic and other characteristics of a family.

	Not using a child car seat		
	Model 1 OR (95% C.I.)	Model 2 OR (95% C.I.)	Model 3 OR (95% C.I.)
Socio-economic factors			
Mother's education			
University	1.00	1.00	1.00
College	3.15 (1.62-6.09)***	2.84 (1.43-5.65)**	2.77 (1.31-5.83)**
Secondary	1.89 (0.94-3.78)	1.56 (0.76-3.21)	1.40 (0.64-3.06)
Vocational or less	3.63 (1.71-7.69)***	3.34 (1.53-7.32)**	3.91 (1.67-9.13)**
Father's education			
University	1.00	1.00	1.00
College	0.86 (0.39-1.90)	0.82 (0.36-1.86)	0.73 (0.30-1.79)
Secondary	1.31 (0.65-2.64)	1.28 (0.61-2.65)	1.32 (0.60-2.89)
Vocational or less	1.19 (0.57-2.50)	1.02 (0.47-2.22)	1.01 (0.44-2.29)
Material welfare of the family			
Good	1.00	1.00	1.00
Medium	0.89 (0.41-1.90)	0.84 (0.39-1.84)	0.64 (0.28-1.46)
Poor	0.84 (0.31-2.26)	0.80 (0.28-2.26)	0.51 (0.17-1.57)
Family type			
Both parents	1.00	1.00	1.00
Parents and relatives	0.85 (0.52-1.40)	0.83 (0.50-1.40)	0.84 (0.48-1.49)
Single-parent family	2.12 (0.78-5.77)	2.59 (0.89-7.51)	3.38 (1.09-10.52)*
SE status of area of resid.			
Good	1.00	1.00	1.00
Medium	2.04 (1.22-3.39)**	2.01 (1.18-3.41)**	2.32 (1.30-4.15)**
Poor	1.44 (0.89-2.33)	1.54 (0.93-2.55)	1.87 (1.07-3.23)*
Type of residence community			
Urban	1.00	1.00	1.00
Suburban	0.72 (0.39-1.34)	0.71 (0.37-1.35)	0.64 (0.32-1.29)
Rural	0.99 (0.62-1.57)	0.88 (0.55-1.43)	0.87 (0.52-1.47)
Demographic factors			
Mother's age			
35 years and more		1.00	1.00
30-34 years		1.22 (0.70-2.14)	1.05 (0.57-1.93)
do 29 years		1.87 (0.89-3.93)	1.66 (0.74-3.74)
Father's age			
40 years and more		1.00	1.00
35-39 years		0.53 (0.29-0.99)*	0.62 (0.31-1.22)
30-34 years		1.11 (0.57-2.15)	1.51 (0.73-3.12)
do 29 years		0.85 (0.33-2.20)	0.85 (0.30-2.42)
Child sequence			
First child		1.00	1.00
Second or latter		3.45 (1.76-6.77)***	3.53 (1.73-7.23)***
Number of children			
One child		1.00	1.00
Two or more		0.58 (0.29-1.17)	0.58 (0.27-1.23)

	Not using a child car seat		
	Model 1 OR (95% C.I.)	Model 2 OR (95% C.I.)	Model 3 OR (95% C.I.)
Gender of the child			
Female		1,00	1,00
Male		0.98 (0.64-1.49)	0.97 (0.61-1.54)
Knowledge			
Good		1.00	1.00
Poor		1.24 (0.81-1.92)	1.10 (0.68-1.77)
Information source			
Books, med. staff		1.00	1.00
Internet, magazines, TV		1.24 (0.76-2.01)	1.21 (0.71-2.04)
None, friends, relatives		0.80 (0.46-1.40)	0.81 (0.44-1.49)
Motivational factors and social norms			
Child vulnerability			
High			1.00
Low			0.72 (0.42-1.24)
Injury severity			
Severe			1.00
Not severe			2.35 (1.35-4.10)**
Safety measure efficacy			
Very effective			1.00
Not very effective			2.59 (1.41-4.76)**
Self-efficacy			
Very self-effective			1,00
Not very self-effective			1.69 (0.98-2.93)
Social norms			
Very important			1.00
Not very important			1.72 (1.03-2.87)*
Hosmer Lemeshow goodness of fit test	p=0.989	p=0.572	p=0.923
Likelihood ratio test	p=0.000	p=0.006 (Model 2 : Model 1)	p=0.000 (Model 3 : Model 2)

* Statistically significant at $p < 0.05$; ** Statistically significant at $p \leq 0.01$; *** Statistically significant at $p \leq 0.001$

4 DISCUSSION

Our research on the behaviour of parents regarding the implementation of safety measures in families with young children confirmed the assumption that low (vocational) maternal education is significantly associated with the non-use of a child car seat during the short rides; however, the association with father's low education was not significant.

Families with mothers with vocational education had higher odds of not using a car seat during short rides compared to families where mothers had a university degree, which is consistent with the findings of most authors (7, 9, 10, 14). At the same time, our results

reveal significant differences between families with highly educated parents, since families where mothers had a college degree had higher odds of not using a car seat compared to families where mothers had a university degree. Parents with lower education level had significantly worse material status compared to parents with university education; they had less knowledge and were more likely to consult less reliable sources of information on child injury prevention, such as their relatives and friends, which is also reported by other studies (10, 14, 18). After controlling for material status and other factors in the model, it is obvious that other parents' characteristics, which are related to education, also influence the non-use of a car seat. E.g., parents with low education less

frequently believe that child injuries are preventable (19); they have wrong beliefs about the invulnerability of their children (20) and are therefore not aware of the importance of ensuring child safety. The differences between families with less and highly educated mothers could be associated with other components of cultural capital, like embodied knowledge, cognitive abilities, skills and competencies (21), higher trust in one's own efficiency for solving problems and stronger motivation (22) of mothers with university degrees.

Family type was also an important factor for the non-use of a child car seat. Single-parent families had higher odds of not using a car seat than families with both parents, which is consistent with the results of some authors (23), while most of them could not prove this premise (7, 8, 10). Authors report that poor implementation of safety measures in single-parent families is associated mainly with their worse material status (23, 24) and their inability to purchase an expensive child car seat (7, 14). However, our results did not confirm this assumption, because family type was significant despite controlling for material status and other factors. This is probably due to the combination of material and social dimension of deprivation (25). Therefore, the behaviour of single-parent families may be influenced by their weak social networks, which does not offer single mothers enough instrumental support from relatives and friends in terms of child care, child transportation and financial or informational assistance (26). Social isolation could also have a negative influence on the opportunity to borrow a car seat, which is a common way to acquire expensive safety equipment in low-income Slovenian families (27).

The association between the non-use of a child car seat and material status of a family was not significant, even though authors report that the non-use of a child car seat is more frequent in low-income families, since car seats are expensive and families with lower SE status have difficulties buying them (7, 8, 14). The lack of disparity in child restraint use due to different material statuses of families is likely to be a reflection of a good social policy in Slovenia, which may improve poor families' financial abilities to buy child car seats. We also assume that families buy child car seats despite their poor material statuses, or they borrow them from relatives or friends, because this is a necessary prerequisite for following the traffic safety regulation.

Families living in areas with poor and medium SE status had higher odds of not using a child car seat compared to families living in areas with good SE status, which is also reported by other authors (28, 29). Our study confirmed an independent influence of the area SE status, therefore the differences in unsafe behaviour between areas are not only the result of geographical clustering of families with similar characteristics, as claimed by some authors

(30). We assume that families who live in poor areas have less opportunities to borrow child car seats because the 'demand' is higher than the 'offer.' It is also possible that risky behaviour of parents is influenced merely by living in the environment with poor 'culture of safety' and thus those parents are not aware of childhood injury risks (10). In such an environment, people generally believe that injuries can rarely be prevented because they are the result of an unfortunate coincidence. In areas with medium SE status, which were predominantly rural, parents' behaviour might be influenced also by other factors, related to area of residence. E.g., lower seat belt usage was reported in areas with low population density (31) and in areas where drivers had a lower perceived risk of being ticketed (32).

The strength of the study is in high parental responsiveness, which greatly reduces bias due to the self-selection of respondents and corresponding difference reduction in odds of parental unsafe behaviour. The study did not involve the data collection on non-participant parents, therefore we were not able to assess the difference between them and participants; however, educational structures of mothers from the study and from Birth registry (33) are very similar, which indicates good representativeness of the sample. By using multivariable analysis in three models, we were able to show that adding demographic factors, motivational factors and social norms to the basic model of SE factors has improved each model's fit to data. Potential interaction effects among individual SE factors and between SE factors and motivational factors/social norms were not significant; therefore, the change in odds ratios in the models is likely to be attributed to confounding variables. These findings revealed the importance of examining motivational factors and social norms as determinants of parents' behaviour regarding the use of child safety equipment.

The study has some limitations. First, the sample included a small number of single-parent families (3%) compared to the proportion of single women (18%) noted in the Birth registry (33). In the study, we asked with whom the child lived, therefore it is possible that a certain share of single mothers answered that the child and herself were staying with her parents or other relatives - in extended family. We also assume that the status of single women could change in the three-year period after the child was born, and that they possibly lived with partners at the time of the research. Nonetheless, it is realistic to expect that women in single-parent families bring their children to preventive well-child visits less frequently compared to parents from other family types, because of higher work overload and lack of help due to weak social networks (34). Second, a self-administered questionnaire was used, therefore parents might give socially desirable responses about the implementation of safety measures,

which could cause some bias due to the misclassification of the outcome, and reduce the differences in unsafe behaviour. Despite that, we decided to use a self-administered questionnaire, because it ensures better anonymity compared to a personal interview, and thus the respondents are more open about socially undesirable behaviours, even though the questions are about sensitive or threatening health care practices (35). In addition to that, the questionnaire did not include any personal data, which would allow for the identification of the child or parents. Studies so far found a high degree of consistency between self-reported safety practices and actual observations (36), and the prevalence of the non-use of a child car seat in our study was very similar to child restraint use measure on Slovenian roads (4). Therefore, we assume that self-reported data in our study are reliable enough. Third, we were unable to prove the independent influence of child's vulnerability on car seat use. It is possible that some parents did not quite understand the question on the risk of their child to be injured in a car crash, which was asked hypothetically, if a child would not be restrained in a car seat during a car ride. If parents who did use a car seat missed this, they might assess that the risk for their child's injury was small, which could lead to the reduction of differences in car seat use.

The study findings about the impact of SE factors on parents' safeguarding behaviour will contribute to a more effective design and implementation of child passenger safety interventions in Slovenia and other comparable countries. Despite the fact that since 1998, we have a law on the mandatory use of safety seats for children's car transportation in Slovenia, our results show that 15% of parents decide not to use child car seat during short rides, wherein parents' low education is not the only SE risk factor. Highly educated parents and single parents also have higher odds of unsafe behaviour. This is the reason why we need to introduce a new counselling programme for all parents during routine well-child visits (37). We assume that parents underestimate the danger of collision during rides near home, and by this they also underestimate the severity of child's injuries and the effectiveness of a safety car seat, as shown in our results. Therefore, information for the parents should be primarily aimed at clarifying the facts on child passenger injury risk and the effectiveness of the child car seat. For less educated parents, individually tailored injury prevention counselling is recommended, which would be designed according to individual's needs and characteristics, and thus parents will be more motivated and likely to use the car seat even during short rides (38). The most successful programmes include the combination of education and hands-on training on how to properly use the child car seat (39, 40), and they could be implemented during routine well-child visits (37). The advantage of integrating such

programmes into well-child care is that they can reach all families, including the ones that may not be using a car seat and therefore do not seek counselling by themselves (37). Inequalities due to unsafe behaviour associated with financial incapacity and social isolation could be further reduced with the provision and installation of free child car seats (40, 41) for eligible families receiving public assistance and single-parent families.

Motivational factors have a great impact on single-parent families' decision to use the car seat. Thus, further research is needed to understand the facilitators and barriers for parents' safe behaviour, which would significantly contribute to designing more effective child passenger safety promotion interventions for vulnerable families. Some other determinants of parents' behaviour, such as perceived risk of being ticketed, descriptive social norms, availability and accessibility of safety equipment, should be examined too.

5 CONCLUSION

Low (vocational) maternal education attainment is associated with unsafe parents' behaviour regarding the use of a child car seat during short rides. However, low maternal education is not the only SE risk factor, since families with college-educated mothers, single parents and families living in areas with poor and medium SE status are associated with the non-use of a child car seat too. In general, the prevalence of the child car seat use is low, thus counselling programmes in combination with hands-on training on how to properly install and use child car seat should be introduced for all parents in the framework of well-child care. Information for the parents should have an emphasis on the facts regarding child passenger injury risk and on the effectiveness of a car seat. Inequalities due to unsafe behaviour associated with low education, financial incapacity and social isolation could be reduced with individually tailored counselling and provision of free child car seats for eligible families and single-parent families.

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CONFLICTS OF INTEREST

The authors declare that no conflicts of interest exist.

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ETHICAL APPROVAL

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AN EXPLORATION OF DIABETIC FOOT SCREENING PROCEDURES DATA BY A MULTIPLE CORRESPONDENCE ANALYSIS

ANALIZA PODATKOV PRESEJALNEGA TESTA ZA DIABETIČNO NOGO Z MULTIPLO KORESPONDENČNO ANALIZO

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ABSTRACT

Keywords:

diabetic foot,
screening, statistics

Aims. Gangrene and amputation are among most feared complications of diabetes mellitus. Early detection of patients at high risk for foot ulceration can prevent foot complications. Regular foot screening (medical history, foot examination and classification into risk groups) was introduced at the out-patient diabetes clinic in Ljubljana in November 1996. We aimed to explore the relationships between the observed variables, check the appropriateness of the risk status classification and of the post-screening decisions.

Methods. The data of 11.594 patients, obtained in 18 years, were analysed by multiple correspondence analysis (MCA). Most of the observed variables were categorical.

Results. The majority of the screened population was free of foot complications. We demonstrated an increasing frequency and severity of foot problems with an increasing age, as well as the association between the loss of protective sensation and the history of foot ulceration, foot deformity and callus formation, the history of foot ulcer or amputation and acute foot ulceration. A new finding was that the location of foot deformity points was closer to female than male gender, indicating the possible role of fashionable high-heel footwear. The appropriateness of therapeutic decisions was confirmed: the points representing absent foot pulses and referral to vascular specialist were close together, as well as points representing foot deformity and special footwear prescription or callus formation and referral to podiatrist.

Conclusions. MCA was applied to the data on foot pathology in the population attending the out-patient diabetes clinic. The method proved to be a useful statistical tool for analysing the data of screening procedures.

IZVLEČEK

Ključne besede:

diabetično stopalo,
presejanje, statistika

Namen. Gangrena in amputacija sodita med najhujše zaplete sladkorne bolezni. Zaplete na nogah lahko preprečimo z zgodnjim odkrivanjem ogroženih bolnikov. V Diabetološki ambulanti Ljubljana izvajamo presejalni test za diabetično stopalo od novembra 1996. Test obsega anamnezo, klinični pregled in klasifikacijo glede na ogroženost. Želeli smo raziskati povezanost med opazovanimi spremenljivkami, preveriti pravilnost klasifikacije bolnikov in ustreznost odločitev po pregledu.

Metode. Podatke 11.594 bolnikov, dobljene v 18 letih, smo analizirali z multiplo korespondenčno analizo (MCA). Večina opazovanih spremenljivk je bila kategoričnih.

Rezultati. Večina opazovane populacije ni imela zapletov na nogah. Dokazali smo, da pogostnost in izraženost težav z nogami narašča s starostjo ter da obstajajo povezave med izgubo zaščitne občutljivosti in razjedo v anamnezi, med deformacijo nog in tvorbo kalusa, med ulkusom ali amputacijo v anamnezi in akutno razjedo. Nova ugotovitev je lokacija točke, ki označuje deformacijo stopala, bliže ženskemu kot moškemu spolu, kar kaže na možen vpliv modnih čevljev z visokimi petami. Potrdili smo ustreznost terapevtskih odločitev: točke, ki označujejo odsotne stopalne pulze, in tiste, ki označujejo napotitev k angiologu, so bile blizu skupaj, prav tako deformacija nog in predpis posebne obutve ali tvorba kalusa in napotitev k pedikerju.

Zaključek. MCA smo uporabili za analizo podatkov o patologiji stopal pri populaciji bolnikov iz naše diabetološke ambulante. Metoda se je izkazala kot uporabno statistično orodje za analizo podatkov o presejalnih testih.

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1 INTRODUCTION

Diabetes mellitus is a chronic metabolic disorder affecting 8-11% of the general population (1). It is one of the major public health problems worldwide, including Slovenia (2). The disease is characterized by elevated blood sugar levels, which damage blood vessel walls, ultimately leading to end-organ injury. The financial burden of diabetes treatment and its complications is enormous (3). Gangrene and amputation are among the most feared complications of diabetes. More than 50% of all non-traumatic amputations are performed on diabetic patients (4, 5). The initial event is usually a foot ulcer, which affects about 15% of all patients with diabetes mellitus.

The major risk factors for diabetic foot ulceration and gangrene are neuropathy, impaired blood supply, trauma and infection. Other contributing factors include a history of previous foot ulcer, improper footwear, low-quality podiatry service, poor metabolic control, psychological factors, tobacco smoking, old age and low social status. Foot complications usually develop due to an interplay of several component causes (4, 6, 7).

Diabetic neuropathy can involve sensory, motor and autonomic nerves. The most prevalent form is distal symmetric sensory neuropathy (8, 9, 10), which affects vibration, light touch, pain, temperature and proprioceptive sensation. Motor neuropathy leads to muscle atrophy, foot deformity (claw-hammer toes), altered biomechanics of walking, and redistribution of foot pressures during standing and walking. Abundant callus formation on pressure points, together with thinning of the submetatarsal head fat pads, additionally increases the magnitude of plantar pressure, and ultimately results in foot ulceration (11, 12). Neuropathy of sympathetic sudomotoric nerves results in diminished or even absent sweating, which causes dry foot skin, prone to cracks and fissures. The distribution of neuropathic changes is usually symmetrical (9, 10).

Due to impaired or absent pain sensation, patients with sensory neuropathy often neglect warning signs of foot disease. Early detection of high-risk patients by systematic screening enables timely implementation of preventative measures to avoid gangrene and amputation (13).

Screening means examination of asymptomatic people to detect those with a high probability of having a given disease (14). In the past, there used to be mass screening for lung tuberculosis; nowadays, all blood products are screened for the presence of HIV.

Foot screening protocol is a set of simple and inexpensive procedures, which reveal the patients at risk for the development of foot ulceration. It consists of one's

medical history (previous foot ulceration, symptoms of neuropathy), foot examination and classification into risk groups.

In Slovenia, there is no national diabetes registry. In 2014, there were 104.550 patients on antidiabetic medications, with the estimated prevalence of diabetes mellitus in the population over 15 years of age being 6.9% (confidence interval 6.3 - 7.6 %) (15). The out-patient diabetes unit at the University Medical Centre Ljubljana is the biggest in Slovenia (with over 11.000 registered patients). Here, we started to perform foot screening in November 1996. The procedure is repeated in every patient at least once a year. In this retrospective survey, we decided to analyse the results of the first screening test. The main analytical tool was multiple correspondence analysis (MCA). The aims of the study were:

1. To reveal the possible new causal relationships among the observed variables and to confirm the causal pathways to foot complications which have already been described before.
2. To evaluate the appropriateness of the classification into risk groups.
3. To evaluate the appropriateness of the post-screening decisions (referral, footwear prescription).

2 METHODS

2.1 Patients and Data Collection

Between November 1996 and December 2014, 11.594 patients with diabetes mellitus were screened (55.2% men, average age 60.81 years): all patients registered at the clinic in November 1996, and afterwards, all newly-diagnosed patients with type 2 diabetes, as well as the patients with type 1 diabetes five years after the diagnosis. For every patient, only the data of the first foot examination were included in the analysis.

The protocol was adopted by the Slovenian Working Group on the Diabetic Foot in 1996, and it is coherent with international recommendations (13). The examination is done by a specialist nurse and evaluated by a diabetologist. The protocol (Appendix 1) includes demographic data (ID, age, sex), medical history (previous foot ulcer, amputation, various symptoms) and foot examination (various deformities, hard skin, ulcer, dry skin, redness, arterial pulses). Risk status classification (groups 1 - 4, Table 1) is done according to the data from medical history and the findings upon foot examination. Therapeutic measures taken after the examination are also recorded: education, footwear prescription, referrals (foot clinic, angiologist, surgeon and chiropodist). The duration of diabetes and the level of metabolic regulation (HbA1c level) are not included in the protocol.

Table 1. Risk status classification.

Category	Description
1	Normal sensation, palpable pedal pulses, no foot deformity
2	Impaired sensation, no foot deformity
3	Absent pedal pulses, normal sensation, no foot deformity
4	<ul style="list-style-type: none"> • Combination: foot deformity and impaired sensation and / or absent foot pulses • Previous ulcer or amputation • Charcot foot

The original data set consists of 56 variables. We included the data of both feet about previous and acute ulceration, amputation and foot pulses. As we have previously demonstrated that the data on neuropathy and foot deformity did not differ between the two feet (16), we decided to include only the data of one (right) foot in the analysis. Among the remaining 24 variables under consideration, all except for age and loss of protective sensation were nominal, mostly dichotomous. The list of the analysed variables is shown in Appendix 2. Age has been recoded to 3 age groups (0: under 51 years, 1: 51 - 70, 2: more than 70 years). The loss of protective sensation has been recoded to 3 categories (0: no loss of protective sensation, 1: unable to feel the monofilament on 1 - 3 points, 2: unable to feel the monofilament on 4 or more points). In this way, there were 52 categories to be analysed altogether.

Statistical analysis was performed with the SAS 9.4, procedures Corresp and IML. The correspondence maps were designed with XLSTAT 2015, procedure Multiple Correspondence Analysis (MCA).

2.2 Multiple Correspondence Analysis

The relationship between variables was summarized by cross-tabulations and analysed by multiple correspondence analysis (MCA). MCA is a powerful descriptive statistical technique for handling larger, more complex datasets, including high-dimensional categorical data often encountered in social sciences, marketing, health economics and biomedical research (17). The primary goal of this exploratory statistical method is to transform numerical information into graphical displays ('maps') and related numerical statistics. The position of the category-points in MCA maps is the basis for revealing the relationship among the investigated variables (17, 18).

2.3 Burt Matrix

MCA can be defined as the correspondence analysis of the so-called 'Burt matrix' **B**. It is a partitioned symmetric matrix containing all pairs of crosstabulations among a set of categorical variables. Each crosstabulation F_{qq} ($q=1,2,\dots,Q$) on the main diagonal of the Burt matrix is a diagonal matrix of the marginal frequencies (i.e., a crosstabulation of a variable with itself). Each off-diagonal crosstabulation is an ordinary two-way contingency table $F_{qq'}$ ($q,q'=1,2,\dots,Q, q\neq q'$). Each contingency table above the diagonal has a transposed counterpart below the diagonal.

$$B = \begin{bmatrix} F_{11} & F_{12} & \dots & F_{1Q} \\ F_{21} & F_{22} & \dots & F_{2Q} \\ \vdots & \vdots & & \vdots \\ F_{Q1} & F_{Q2} & \dots & F_{QQ} \end{bmatrix}$$

As mentioned before, we have analysed a data set of 24 variables ($Q=24$), containing altogether 52 categories ($J=52$). Therefore, the Burt matrix is a symmetric matrix consisting of 52 rows and columns (Table 2).

Table 2. The Burt matrix, the presentation of crosstabulations reduced to the first two variables and the last variable (the complete matrix at (19)).

	SEXF	SEXM	NSY0	NSY1	...	AMPO	AMP1	Total
SEXF	5193	0	2519	2674	...	5167	26	124632
SEXM	0	6401	3876	2525	...	6357	44	153624
NSY0	2519	3876	6395	0	...	6376	19	153480
NSY1	2674	2525	0	5199	...	5148	51	124776
⋮	⋮	⋮	⋮	⋮		⋮	⋮	⋮
AMPO	5167	6357	6376	5148	...	11524	0	276576
AMP1	26	44	19	51	...	0	70	1680
Total	124632	153624	153480	124776	...	276576	1680	6678144

On the basis of the Burt matrix, one can calculate rows of relative frequencies (the division of row frequencies by the marginal total), called profiles, representing each variable category (Table 3). The marginal row of relative frequencies at the bottom of the table presents the average profile (Total). Categories with similar profiles have similar characteristics for the variables considered. Unfortunately, due to numerous categories, direct inspection of all profiles and formation of homogenous profile groups is impossible. For that reason, the numerical information contained in the Burt matrix has been analysed with MCA.

Table 3. The matrix of row profiles (source: Table 2).

	SEXF	SEXM	NSY0	NSY1	...	AMP0	AMP1	Total
SEXF	4.1667	0.0000	2.0212	2.1455	...	4.1458	0.0209	100
SEXM	0.0000	4.1667	2.5230	1.6436	...	4.1380	0.0286	100
NSY0	1.6413	2.5254	4.1667	0.0000	...	4.1543	0.0124	100
NSY1	2.1430	2.0236	0.0000	4.1667	...	4.1258	0.0409	100
⋮	⋮	⋮	⋮	⋮		⋮	⋮	⋮
AMP0	1.8682	2.2985	2.3053	1.8613	...	4.1667	0.0000	100
AMP1	1.5476	2.6190	1.1310	3.0357	...	0.0000	4.1667	100
Total	1.8663	2.3004	2.2982	1.8684	...	4.1415	0.0252	100

2.4 Dimensionality of MCA Solution

Based on the Burt matrix one can form the matrix

$$D_B^{-1/2} (P_B - P_B P_B') D_B^{-1/2}$$

where D_B is a diagonal matrix with the elements of the average profile on the main diagonal, P_B is a matrix of relative frequencies of the Burt matrix (division of Burt matrix by the grand total) and p_B is an average profile (Table 3). The expression in brackets represents the deviations of observed relative frequencies of the Burt matrix from the model of independence, while $D_B^{-1/2}$ is a weighting factor matrix.

Basic calculations are made in three steps:

1. Find the eigenvalue-eigenvector decomposition of the matrix (2)

$$D_B^{-1/2} (P_B - P_B P_B') D_B^{-1/2} = \check{\Gamma} D_\delta \check{\Gamma}'$$

where $\check{\Gamma}$ is an orthogonal matrix of eigenvectors

$$\check{\Gamma}' \check{\Gamma} = I$$

and D_δ is a diagonal matrix of eigenvalues δ_j

$$D_\delta = \text{diag}(\delta_1, \delta_2, \dots, \delta_L)$$

The number of nontrivial singular values is equal to $L = J - Q$ ($L=28$). In case of the analysis of Burt table, the principal inertias λ_l are defined as the squared values of singular values δ_l .

2. Calculate the matrix of standard coordinates

$$\Gamma = D_B^{-1/2} \check{\Gamma}$$

3. The corresponding principal coordinates are given by

$$Y = \Gamma D_\delta^{1/2}$$

Table 4. The first two principal coordinates of the matrix Y.

	1. principal coordinate	2. principal coordinate
SEXF	0.045545	0.264007
SEXM	-0.036950	-0.214184
NSYO	-0.337288	-0.219527
NSY1	0.414879	0.270028
HVA0	-0.071098	-0.165217
HVA1	0.340644	0.791587
⋮	⋮	⋮
AMPO	-0.011657	-0.010940
AMP1	1.919002	1.801034

MCA includes the fitting of the diagonal submatrices F_{qq} ($q=1,2,\dots,Q$) of the Burt matrix. As a result, the total inertia is inflated and thus the proportions of the first few principal inertias as parts of the total inertia are reduced (21, p.155). One way to address this problem, proposed by Benzécri (22), is to consider only those principal axes whose eigenvalues are higher than $1/Q$ (i.e. $1/24=0.041667$ in this application, see Table 5). These adjusted inertias $\tilde{\lambda}_k$ can be calculated according to Benzécri's formula

$$\tilde{\lambda}_k = \left[\frac{Q}{Q-1} \left(\delta_k - \frac{1}{Q} \right) \right]^2 \quad k = 1, 2, \dots$$

with the condition that these be calculated for $\delta_k > 1/Q$ only.

The number of inertias has been reduced from 28 to only 9, with strongly dominating values of the first two principal inertias. The values of the adjusted inertias $\tilde{\lambda}_k$ are shown in Table 5.

Table 5. The adjustment of inertias.

	Singular values δ_l	Burt principal inertia λ_l	Adjusted inertia $\tilde{\lambda}_k$	Percentage of adjusted inertia	Cumulative percentage of adjusted inertia	16 32 48 64 80 -----+-----+-----+-----+-----
1	0.20583	0.04237	0.02934	66.72182	66.72182	*****
2	0.11983	0.01436	0.00665	15.12592	81.84773	***
3	0.07324	0.00536	0.00109	2.46806	84.31580	*
4	0.06369	0.00406	0.00053	1.20083	85.51663	
5	0.04969	0.00247	0.00007	0.15938	85.67600	
6	0.04743	0.00225	0.00004	0.08224	85.75824	
7	0.04398	0.00193	0.00001	0.01325	85.77149	
8	0.04196	0.00176	0.00000	0.00021	85.77170	
9	0.04174	0.00174	0.00000	0.00001	85.77171	
⋮	⋮	⋮				

$$\bar{\phi}^2 = 0.04398$$

The next question is the quality of the presentation of the position of the profiles based on the first few principal coordinates. M. Greenacre (21) calculates the percentage of inertia as follows

$$\tilde{\lambda}_k \% = 100 \frac{\tilde{\lambda}_k}{\bar{\phi}^2} \quad k = 1, 2, \dots$$

where $\bar{\phi}^2$ is an average of the off diagonal inertias $\phi_{qq'}^2$, i.e.

$$\bar{\phi}^2 = \frac{1}{Q(Q-1)} \sum_{q=1}^Q \sum_{q' \neq q}^Q \phi_{qq'}^2$$

where $\phi_{qq'}^2$ is the off-diagonal inertia; e.g., chi-square measure of association (based on particular crosstabulation in the Burt matrix) divided by the number of units observed.

The values of percentages of adjusted principal inertias and the cumulative percentages of adjusted principal inertia are also shown in Table 5. According to the aforementioned Greenacre's approach to the calculation of percentages of inertia, 81.85% of the total inertia is explained by the first two principal axes. Therefore, without losing too much information, the representation of the positions of the profiles (category points) based on the first two principal coordinates (on a two-dimensional map) can serve as a good basis for the thorough analysis of the relationship between considered variables.

3 RESULTS: MAPS AND ANALYSIS

The spread of the profiles is evaluated as total inertia. When the cumulative percentage of inertia of the first two dimensions is relatively high, then most of the profiles are well represented in a two-dimensional map (by their projections onto a plane). Thus the two-dimensional solution of our example (Table 4) explaining 81.85% of the total inertia (Table 5) can serve as a good basis for the display of the profiles (Figure 1).

In correspondence analysis, the average profile is represented as a point in the origin of the coordinate system. The deviation of a particular variable category point from the origin is determined by its share in the sample: the lower the share, the farther the category point from the origin.

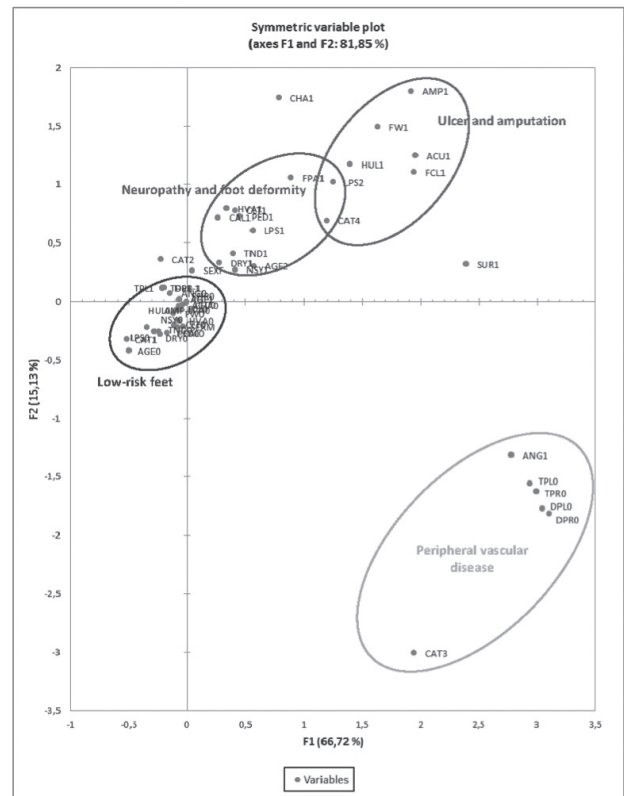


Figure 1. A two-dimensional map - a display of all categories (extended labels in Appendix 2).

In our case (Figure 1), the categories with high shares (younger age group - AGE0, no history of foot ulcer - HUL0, no loss of protective sensation - LPS0, absence of foot deformities, palpable pulses of pedal arteries) are concentrated in the left lower quadrant, close to the origin.

On the other side, the points representing the presence of particular foot deformities, loss of protective sensation, and acute foot ulceration are distributed in the right upper quadrant.

There is a separate group of category points in the right lower quadrant, which represents the patients with absent foot pulses. Close to them is the point representing referral to vascular specialist. The point representing group 3 (pure ischaemia and no neuropathy) is a little away.

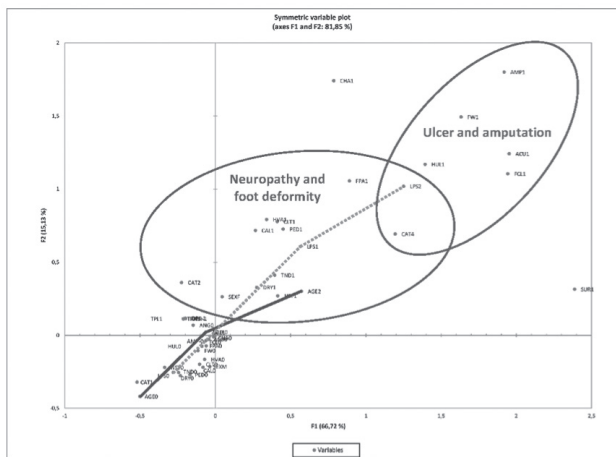


Figure 2. A zoom-in display of the upper part of Figure 2.

The zoomed-in upper part of Figure 1, where the majority of the points are located, is shown in Figure 2.

The points representing the ordinal variables are connected with broken lines. The solid line connecting the age groups (AGE1, AGE2, AGE3) is stretched in the direction from the left lower to the right upper quadrant. The youngest age group (under 50, AGE0) is situated at the left lower end.

The dotted line, representing the ordinal character of protective sensation loss, from LPS0 to LPS2, follows almost the same direction as age groups, with no loss of sensation (LPS0) in the left lower quadrant and loss of sensation (LPS2) in the right upper quadrant.

4 DISCUSSION AND CONCLUSIONS

The decision to conduct the study was based on the belief that it could contribute to improved diabetic foot care in Slovenia. This would be important from the public health aspect, since Slovenia had the second highest age-sex standardised amputation rate per 100 000 population among the observed countries, and the highest age-sex standardised amputation rate per 100 000 people with diabetes, according to the data from the OECD health statistics report published in 2015 (23).

Regular preventative foot examinations are the cornerstone of efficient amputation prevention strategies. With the introduction of a new organisation at the primary health care level, called model practices, the frequency of foot examinations has increased significantly (24).

Our retrospective analysis of the large foot screening data set has confirmed most of the already known relationships in the development of foot pathology, and revealed a stronger association of foot deformity with female than

with male gender. The survey has confirmed that the risk status classification and the post-screening decisions were concordant with the data obtained by screening.

We have decided to use MCA because it has proved to be a strong tool for examining the association between signs and symptoms described by mostly nominal data. In 1989, Crichton described its use on two big data sets of patients with chest pain and acute abdominal pain (25). MCA has been used in the analysis of data in psychiatry (26), rheumatology (27), infectious diseases (malaria) (28) and oral health (29).

Recently, Sacco et al.(30) used MCA to reveal early indicators of diabetic polyneuropathy. Their study included 193 patients without partial or total foot amputation, major vascular complications or severe nephropathy. On the contrary, our study was performed on an unselected population of patients with diabetes. To the best of our knowledge, no analysis of such large data set has been published so far.

Screening is a strategy used in a population to identify the possible presence of an as-yet-undiagnosed disease in asymptomatic individuals. The majority of the screened population is supposed to be disease-free, and the points representing the individuals without a condition are therefore concentrated close to the origin of the coordinate system. As expected, the points representing the absence of impaired blood supply, foot deformity, neuropathic symptoms and previous or current foot ulceration were all located close to the origin.

The decline of neurological functions (in particular vibrating sensation) with aging is well established (31, 32, 33). Accordingly, we found the position of points representing foot deformity and neuropathic symptoms close to the point of the age group over 70 years. Unfortunately, our protocol does not include the data on diabetes duration and metabolic control, which are known risk factors for chronic complications of diabetes (34).

Some other apparently obvious associations have been demonstrated: the category point representing the history of foot ulceration was close to the points representing the loss of protective sensation, acute foot ulceration and fat pad atrophy. The points representing various foot deformities (claw toes, hallux valgus, toenail deformity) were close together and also close to abundant callus. Dry skin (indicating autonomic neuropathy) was close to neuropathic symptoms, and both were close to moderate loss of protective sensation (LPS1).

The location of foot deformity points closer to female than male gender was unexpected, but could possibly be explained by the inappropriate footwear in women.

Foot screening in our centre is done by a nurse and evaluated by a physician -diabetologist. The risk category classification is a subjective decision based on the data from medical history and foot examination, and as such it might be prone to error. We conclude that it was done properly, since the points representing the four risk categories were distributed as expected: The risk group 1 point (normal sensation, no deformity) is among the points representing the absence of particular foot pathologies. The risk group 2 point (the loss of protective sensation, no deformity) is located away from the foot deformity points. The risk group 3 point (absent foot pulses, normal sensation, no deformity) is close to absent foot pulses and far away from neuropathy. The risk group 4 point (previous ulcer or amputation, Charcot, combination of neuropathy, ischemia and foot deformity) is close to those representing neuropathy, foot deformity, ulcer and amputation.

The patients with impaired blood supply form a special group - possibly due to subjective symptoms, they seek help in earlier stages, and are therefore not discovered only by screening. It might be surprising that the point of group 3 (the group with pure ischaemia and no neuropathy) was not closer to the points representing absent foot pulses. A possible explanation is that the patients with poor blood supply may have other problems, a combination of disease changes, which classify them into the risk group 4.

The post-screening decisions were also appropriate: the point representing footwear prescription was close to foot deformity, referral to foot clinic was close to acute foot ulceration, referral to angiologist close to absent foot pulses, and referral to the surgeon closer to acute foot ulceration than to absent pedal pulses.

The main weakness of our study is that it included patients with different duration of diabetes. With longer duration of diabetes, the prevalence of neuropathy and peripheral arterial disease increase. Nevertheless, their influence on the development of foot ulceration mainly depends on their severity and not on duration.

In human medicine, we are often faced with the situations where categorical (nominal and ordinal) variables are predominant. Even some laboratory results, although physical readings, are essentially of ordinal nature. For that reason, we believe that MCA can be useful in the analysis of medical data.

CONFLICTS OF INTEREST

The authors declare that no conflicts of interest exist.

FUNDING

The study had no funding.

ETHICAL APPROVAL

The data analysed in this study were collected at the University Medical Centre Ljubljana 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).

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Journal: **Zdravstveno varstvo (ZV) ISSN 0351-0026 (print edition) / Slovenian Journal of Public Health (SJPH) ISSN 1854-2476 (electronic edition)**

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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 Postavitev strani/Številke vrstic (tako bo na robu vsake vrstice dokumenta dodana številka vrstice).

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

Sistem najbolje deluje, če uporabljate zadnjo različico Acrobat.

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

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.

PRIMERI ZA CITIRANJE LITERATURE

primer za knjigo:

1. Premik M. Uvod v epidemiologijo. Ljubljana: Medicinska fakulteta, 1998.
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. Barry HC, Hickner J, Ebell MH, Ettenhofer T. A randomized controlled trial of telephone management of suspected urinary tract infections in women. J Fam Pract 2001; 50: 589-94.

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. Payne DK, Sullivan MD, Massie MJ. Women's psychological reactions to breast cancer. Semin Oncol 1996; 23(Suppl 2): 89-97.

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. Bartol T. Vrednotenje biotehniških informacij o rastlinskih drogah v dostopnih virih v Sloveniji: doktorska disertacija. Ljubljana: Biotehniška fakulteta, 1998.

primer za elektronske vire:

12. Mendels P. Textbook publishers extend lessons online. Available Sept 23, 1999 from: <http://www.nytimes.com/library/tech/99/09>.

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. 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.