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THE EFFECTIVENESS OF HEALTH EDUCATIONAL MATERIALS IN THE PREVENTION OF NON-COMMUNICABLE DISEASES

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ABSTRACT: Non-communicable diseases (NCDs) are the leading causes of morbidity, disability, and mortality among the world's population. In this research, we aim to determine the knowledge about the risk factors for NCDs, as well as socio-demographic differences in the effectiveness of health education materials in disease prevention. Instrument was prepared according to methodological guidelines for population health risks survey (Eurostat, 2018) and knowledge and attitudes related to NCD questionnaire survey. Sample size included 210 participants of both genders ($N_{\text{male}} = 105$, $N_{\text{female}} = 105$) systematically selected, residents of Belgrade, Republic of Serbia, who did not have diagnosed chronic non-communicable diseases and used services at primary health care centre Zvezdara. Research results indicate that 27% of all participants had one or more health educational activities in the last six months. More than two thirds of respondents (71%) know that tobacco usage is the leading cause of cardiovascular diseases, but 54,8% know that cause malignant diseases. More than two thirds of respondents know that inadequate nutritional habits, consumption of industrial products and sweets and low vegetable intake cause cardiovascular diseases and more than half of them know that inadequate nutritional habits causes malignant diseases. Statistically significance difference between groups of participants based on level of education are obtained in attitudes towards the effectiveness of health education material in the prevention of malignant diseases ($F = 3.396$, $p < .05$), diabetes ($F = 3.611$, $p < .05$) and respiratory diseases ($F = 3.483$, $p < .05$) and socio-economic differences in the use of printed and video materials in the prevention of NCDs. Effectiveness of health education materials through preventive activities improve health and reduce risks for NCDs.

Keywords: knowledge, attitudes, cardiovascular diseases, malignant diseases, risk factors.

INTRODUCTION

Despite the implementation of different programs in the field of public health and the implementation of interventions aimed at reducing risk factors (Jović, 2016), the leading problems in the 21st century on a global level are social consequences of urbanization and increased exposure to risk factors for non-communicable diseases (NCDs) (Ramić-Čatak, 2017). Chronic diseases are the leading causes of death and disability worldwide, and prevalence of those diseases is rising sharply, and progressing in all regions within all socio-economic classes. Main risk factors for chronic diseases are cigarette consumption, exposure to tobacco smoke, poor diet, lack of physical activity and excessive alcohol consumption (WHO, 2014a,b; CDC). According to data of population health in the Republic of Serbia, one-third of population over the age of 20 have hypertension (Stojadinović et al., 2014), while in addition to irregular physical activity and obesity, cardiovascular disease can occur as a consequence of osteoporosis in the elderly (Tasić et al., 2014). Leading risk factors for the development of cardiovascular and malignant diseases are tobacco and alcohol use, improper diet, and insufficient physical activity (Šiljak, 2019).

Due to significant percentage of countries face various forms of chronic diseases, the need for preventive activities in the community, families, organizations, regions, and different social strata has never been greater (Sranachoenpong & Hanning, 2011; Bhattarai et al., 2019). Under the umbrella of organised health care preventive programmes, the incidence of risk factors for chronic diseases could be controlled

(Eminović, 2018). The health care system should be equipped to provide all necessary materials for information, education, and counselling for health promotion in health facilities (Parker et al., 2012). Media techniques, printed materials, advertising materials, computer methods, and printed media, such as posters, leaflets, magazines, and articles, are commonly used forms of information providing health and preventive health care (Vuković, 2012). Prevention programs and adequate health education of the population can improve overall well-being and reduce the rate of diseases to a minimum (Bonnie, Stroud & Breiner, 2014).

The usefulness of simple health education materials for education of population and evaluation of health promotion and prevention programs increases in the health care system. The design and implementation of effective health education materials is a systematic process, which begins with a definition of educational goals, production, participation of different profiled experts, and its validation (Arora et al., 2017). Environmental factors could have positive and negative impacts on health (Šiljak, 2019). The positive impact is oriented on provision of accessible primary and secondary education, health care, and general hygienic aspects related to housing, regardless of the social status of the individuals. The negative impact on health could be reflected on various risk factors from the place of living and working environment. Activities in area of health promotion and diseases prevention are focused on individual's behaviour in relation to social, cultural, and organizational factors, active participation in preventive activities in community, as well as the development and implementation of activities (Koelen, Vaandrager & Colomé, 2001).

Given the fact that an increasing number of residents are at risk for various chronic diseases, this paper aims to determine the knowledge and attitudes to the risk factors for NCDs, as well as effectiveness of health education materials in the disease prevention based on socio-economic status and level of education of participants.

MATERIAL AND METHOD

The research was conducted in Belgrade, at Zvezdara Health Center, which is located in municipalities of Vračar, Voždovac, and Novi Beograd, during spring 2021. Sample size included 210 participants older than 18 years, of both genders ($N_{\text{male}} = 105$, $N_{\text{female}} = 105$) systematically selected, residents in Belgrade, Republic of Serbia, who don't have diagnosis of chronic diseases, giving the consent in participation of study, and using services at primary health care centre Zvezdara.

For the purposes of this research instrument was prepared according to standard methodological guidelines for population health risks survey (Eurostat, 2018) and questionnaires about knowledge and attitudes related to NCD from similar scientific and professional manuscript. Participation in research was anonymous. Questionnaire was prepared in three parts. The first part was used for collecting basic socio-demographic characteristics of participants (gender, age, level of education, socio-economic status, etc.). Gender is classified as male and female, while age groups are classified in ten groups of respondents older than 18. Level of education is classified as primary, secondary and high level of education, while socio-economic status categorized as poor, average and good. The second part of questionnaire provides insight into the exposure of respondents to risk factors (smoking, alcohol, physical activity, and nutritional habits), knowledge, and views about their impact on the occurrence of NCDs (cardiovascular diseases, cancer, diabetes, respiratory diseases). The level of knowledge and attitudes was assessed on a three-point scale with accuracy of statement on risk factors related to NCD (yes, no, and not sure). The last part was intended to collect attitudes of respondents regarding the importance and impact of health educational material in NCDs prevention. The level of agreement with the statements, from the strongest to the weakest level of agreement, was determined by a five-point Likert-type scale. A higher score, obtained on the basis of the respondents' answers, indicates a higher result and a more positive attitude of the respondents towards the stated statement. The Ethics Committee of the Primary Health Centre approved the study.

Descriptive statistical methods were used to describe the data. To assess the significance of the difference in individual attitudes of respondents based on socio economic status and level of education were determined by One-way ANOVA, while the post-hoc Tukey test was used to confirm the differences occurred between groups. For all applied analytical methods, statistically significant was the value of error probability $p < 0.05$. The statistical package for social sciences was used in data processing (SPSS for Windows, version 21.0, 2012).

RESULTS

Out of 210 participants ($N_{\text{male}} = 105$, $N_{\text{female}} = 105$) included in the study 12.4% were in age groups (31–35 years and 36–40) years old, respectively. According to the level of education, most of respondents (52.8%) have high school, 75,7% are employed, with mainly monthly income between 10 001-30 000 RSD (85 EURO) and living in average social status (48,1%) (Table 1). Only 27% of participants had the experience of participation in preventive services in the last six months.

Table 1. Demographic and socio-economics characteristics of participants (N=210)

	Total	
	N	%
Gender		
Male	105	50
Female	105	50
Age group		
18-24	19	9
25-30	16	7.6
31-35	26	12.4
36-40	26	12.4
41-45	20	9.5
46-50	17	8.1
51-55	22	10.5
56-60	15	7.6
61-65	25	11.9
+ 65	23	11
Education level		
Primary	5	2.4
Secondary	94	44.8
High school and Faculty	111	52.8
Employment status		
Unemployed	9	4.3
Employed	159	75.7
Other (pensioner, student, other)	42	20
Socio-economic status		
Poor	39	18.6
Average	101	48.1
Good	70	33.3
Monthly level of income per family member		
under 10 000 RSD (under 85 EURO)	2	1
10 001- 30 000 RSD (86-254 EURO)	97	46.2
30 001- 50 000 RSD (255-424 EURO)	51	24.3
+ 50 000 RSD (+425 EURO)	60	28.6
Experience in participation in preventive activities		
Yes	56	27
No	154	73

The knowledge about the risk factors for NCDs (Table 2), examined through this research, have shown that the usage of tobacco products is leading risk factor for cardiovascular (71%) and malignant (54.8%) diseases based on the answers. The usage of alcoholic products is the risk factor for cardiovascular diseases, by the answer of 94 (44.8%) respondents, while the same percentage was not sure that these products are the risk factors for their occurrence. About half of the respondents (46.7%) were unsure that alcoholic products could initiate development of malignant diseases. In most cases of answers, physical inactivity was one of the risk factors for cardiovascular diseases (43.3%), but not for malignant diseases (56.7%). A high percentage of participants shared the thought that consumption of industrial products, sweet beverages, and cakes and insufficient consumption of vegetables were the risk factors for cardiovascular (77.1%:84.8%) and malignant diseases (44.3%:56.7%). More than 40% of respondents are not sure that alcohol and physical inactivity are risk factors for cardiovascular diseases, and each fifth respondents is not sure that industrial products and sweet beverages lead to cardiovascular diseases (Table 2).

Table 2. Knowledge and attitudes to the risk factors for NCDs

Risk factors	Cardiovascular disease						Malignant diseases					
	Yes		No		Not sure		Yes		No		Not sure	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Tobacco products use	149	71	20	9.5	41	19.5	115	54.8	17	37.1	78	37.1
Alcohol products use	94	44.8	22	10.5	94	44.8	69	32.9	43	20.5	98	46.7
Physical inactivity	91	43.3	27	12.9	92	43.8	58	27.6	119	56.7	33	15.7
Consumption of industrial products, sweet beverages and cakes	162	77.1	5	2.4	43	20.5	93	44.3	14	6.7	109	49
Insufficient consumption of vegetables	178	84.8	7	3.3	25	11.9	119	56.7	31	14.8	60	28.5

Table 3 shows the differences in attitudes towards the effectiveness of health education materials in NCDs prevention based on level of education and socio economic status of participants. Statistically significance difference between groups was obtained in attitudes towards the effectiveness of health education material in the prevention of malignant diseases ($F= 3.396$, $p<0.05$), diabetes ($F= 3.611$, $p< 0.05$) and respiratory diseases ($F= 3.483$, $p< 0.03$). Respondents with primary level of education found that health education material is important in the prevention of malignant diseases, while those with high level of education found it more important in prevention of diabetes and respiratory diseases. Respondents who are living in poor socio-economic conditions have strongly agreed on the impact of printed ($F= 5.817$, $p= 0.01$) and video health education material ($F= 4.945$, $p= 0.01$) in the prevention of NCDs.

Table 3. Attitudes towards the importance of health education material in the disease prevention

Attitude Health education material is important	Level of education	M	SD	F	p	Socio economic status	M	SD	F	p
In the prevention of malignant diseases	High	3.68	1.09	3.396	0.03	Good	3.70	0.98	1.53	0.21
	Secondary	3.32	1.07			Average	3.43	1.00		
	Primary	3.80	0.99			Poor	3.46	1.21		
In the prevention of diabetes	High	3.76	1.30	3.611	0.02	Good	3.81	0.94	2.894	0.06
	Secondary	3.39	1.06			Average	3.44	0.99		
	Primary	3.20	0.96			Poor	3.54	1.21		

In the prevention of cardiovascular diseases	High	3.95	1.22	1.505	0.22	Good	3.80	1.00	1.314	0.27
	Secondary	3.70	1.13			Average	3.77	1.02		
	Primary	4.00	0.91			Poor	4.08	1.08		
In the prevention of respiratory diseases	High	3.55	1.58	3.483	0.03	Good	3.49	0.93	0.592	0.55
	Secondary	3.20	1.07			Average	3.32	0.95		
	Primary	3.00	0.89			Poor	3.36	1.27		
In the prevention of hypertension	High	3.69	1.14	1.490	0.23	Good	3.80	0.88	2.846	0.06
	Secondary	3.47	1.04			Average	3.45	0.91		
	Primary	3.40	0.88			Poor	3.56	1.19		
For prevention of disability, as a consequence of various condition and diseases	High	3.75	1.30	2.068	0.13	Good	3.79	0.95	1.629	0.19
	Secondary	3.47	1.05			Average	3.50	0.95		
	Primary	3.80	0.94			Poor	3.64	1.20		
Used in printed form in the prevention of non-communicable diseases	High	3.37	1.14	0.692	0.50	Good	3.51	1.06	5.817	0.01
	Secondary	3.23	0.98			Average	3.08	0.78		
	Primary	3.60	0.99			Poor	3.56	1.19		
Used as a video material in the prevention of non-communicable diseases	High	3.42	1.18	0.130	0.88	Good	3.60	1.18	4.945	0.01
	Secondary	3.37	1.05			Average	3.15	1.02		
	Primary	3.20	1.30			Poor	3.67	1.13		

M- mean, F- ANOVA F statistic value, p- Statistical significance level

The content of health education material has an important role in change of risk behaviour and improvement of own health. Based on data shown in Table 4, it was obtained that content of the health education material improves knowledge and change behavior toward own health mainly by respondents with high level of education and living in good socio economic status without significance differences between groups of them. Furthermore, respondents with better life conditions based on good socio-economic status and high level of education have increased awareness of the importance of health educational material focused on prevention and motivation to improve own health.

Table 4. Attitudes towards the effectiveness of the content of health education material in the disease prevention

Attitude Content of health education material	Level of education	M	SD	F	p	Socio economic status				
						M	SD	F	p	
Improves knowledge and change behavior toward own health	High	3.77	0.94	1.869	0.16	Good	3.86	1.04	2.649	0.07
	Secondary	3.51	1.08			Average	3.50	0.97		
	Primary	3.40	1.34			Poor	3.67	1.08		
Improves knowledge and changes the behavior towards the health of others in the community	High	3.72	1.34	2.835	0.06	Good	3.70	1.04	0.38	
	Secondary	3.39	1.06			Average	3.49	0.86		
	Primary	3.40	0.91			Poor	3.54	1.25		0.970
Stimulates a healthy lifestyle	High	3.95	1.14	2.643	0.07	Good	3.94	0.95	0.967	0.38
	Secondary	3.66	1.02			Average	3.75	0.91		
	Primary	3.60	0.85			Poor	3.74	1.04		
Increases motivation to improve health	High	3.95	1.34	2.516	0.08	Good	4.00	0.96	2.051	0.13
	Secondary	3.68	0.99			Average	3.71	0.88		
	Primary	3.40	0.87			Poor	3.74	1.07		
Increases the degree of responsibility for own health	High	3.76	1.30	0.847	0.43	Good	3.77	1.02	0.838	0.43
	Secondary	3.67	1.03			Average	3.61	0.95		
	Primary	3.20	0.95			Poor	3.82	1.07		
Increases awareness of the importance of prevention	High	3.69	1.14	0.601	0.54	Good	3.76	1.03	1.624	0.20
	Secondary	3.56	0.99			Average	3.50	0.86		
	Primary	3.40	0.94			Poor	3.72	1.09		

Provides adequate guidelines for the use of preventive health services	High	3.76	1.58	1.933	0.14	Good	3.73	0.90	0.307	0.74
	Secondary	3.62	0.95			Average	3.62	0.88		
	Primary	3.00	0.87			Poor	3.72	1.12		
Provides new information on prevention activities	High	3.80	1.30	2.398	0.09	Good	3.81	0.92	1.110	0.33
	Secondary	3.56	0.97			Average	3.60	0.83		
	Primary	3.20	0.86			Poor	3.64	1.16		
Provides insight into risk factors and ways to overcome them	High	3.75	1.51	0.414	0.66	Good	3.74	1.03	0.176	0.84
	Secondary	3.63	0.94			Average	3.65	0.91		
	Primary	3.60	0.96			Poor	3.69	1.00		

M- mean, F- ANOVA F statistic value, p- Statistical significance

DISCUSSION

Health education and preventive services implemented through promotional and preventive activities aims to ensure the elementary health needs of the population (Šiljak, Niškanović & Stojisavljević, 2018). Preventive activities in area of health education using of health promotional materials and implementation of continual preventive activities are considerable in the education of society about potential risk factors and actions to prevent the occurrence of NCDs. According to the data of the Institute of Public Health of Serbia, “Dr. Milan Jovanović Batut”, programmes of health education in Belgrade primary health care centres, during 2018, were realized by applying various health education methods (Miltenović, 2020). Preventive health activities on the territory of the city of Belgrade were realized both in health centres and in the community by health professionals and associates. Of 210 participants, in total, 154 (73%) did not have experience related to the health education and health education material in the last six months, which is lower than in European and Asian Counties (Amaraskera, 2016; Tedesco, 2014).

Factors such the use of processed foods, rapid urbanization, lifestyle changes and changes in eating habits characterized by excessive intake of salt, sugar and usage of tobacco products resulting in a drastic increase in cardiovascular diseases such as hypertension, heart attack, and others (Rajnarayan et al., 2006; Šarčević, Lilić & Vranić, 2014; Tasić et al., 2014; Mikkelsen et al., 2019;). Studies from the South-East Asian region, Eastern Mediterranean, and European region show that smoking cause oral and oesophageal cancers, pancreatic cancer, stomach, kidney, liver, bladder, cervix, colon, and rectum, as well as leukemia, and high risk of death from lung, cervical and prostate cancer (Wang et al., 2017; Gupta et al., 2018; Božić et al., 2020). Therefore, it is important to underline that specifically adequate knowledge, positive attitudes and health promotion behaviours regarding to CVD could reduce incidence of the diseases. The level of knowledge about risk factors (smoking, alcohol consumption and inadequate nutritional habits) regarding CVD by more than half of respondents was adequate which is similar to studies in Italy (Tedesco, 2014), India (Poudel, 2017) and Iran (Mazloomi, 2013). The majority of respondents, more than two thirds of them, know that inadequate nutritional habits (consumption of industrial products, sweet beverages, and cakes and insufficient consumption of vegetables) are the risk factors for cardiovascular and malignant diseases. In Italian study more than 60% of people know that high salt diet cause CVD (Tedesco, 2014), while in French study highest risks for CVD are fat diet, smoking and physical inactivity (Kelly-Irving, 2010). In the United States study among young adults’ knowledge of CVD risks factors are most corrected for smoking, saturated fat found in animal products and high blood cholesterol (Winham, 2011).

Research data showed that insufficient physical activity is directly related to mortality and morbidity of NCDs (Jakovljević & Đorđević, 2017; Ding, 2018; Medina et al., 2021).

According to our study results, physical inactivity is risk factor for cardiovascular disease for more than 40% of respondents, in Italian study 47,3% of people (Tedesco, 2014), which is similar to study in

New England (Gans, 1999) in which highest knowledge score for CVD were physical inactivity and high fat diet. One of the segments of this research was to determine the attitudes towards the effectiveness of health education materials in NCDs prevention. Results of our research show that the content of health education material can be important for motivation and improvement of health and lifestyle related to health behaviour. Significant differences based on participants' socio-economic status and level of education were obtained. Namely, participants with good socio-economic status and high level of education had positive attitudes towards importance of health education material in motivation and improvement of healthy lifestyle than other groups of participants, which is similar to studies in India (Verma, 2019), Sri Lanka (Amarasekara, 2016) and Iran (Koochi, 2020). Also, participants with good socio-economic status and high level of education had positive attitudes towards the importance of health education material in malignant diseases and diabetes mellitus prevention. The results on the effects of preventive activities and the health education methods used correspond to similar research in Europe and Asia (Baker, 2011; Parker, 2012; Mikkelsen, 2019, Wu et al. 2017; Winham, 2011). Low level of education of respondents was associated with usefulness of printed health education materials as well as in study in England (Maskell, 2018) and Kentucky, United States (Ryen, 2014).

The health care system's functioning, planning, and implementation of preventive activities can be improved by continuous and relevant data collection within all health care levels. There is a small number of researches aimed to assess the effectiveness of health education materials and methods in NCDs prevention in Republic of Serbia. The importance of the conducted study reflects the acquisition of preliminary insight into the following: individuals' knowledge of main risk factors for NCDs and the attitudes towards using health education materials in preventive activities. The limitations of our study are relatively small sample size in one municipality in Belgrade and a survey provided only with beneficiaries of health care services.

CONCLUSION

Non-communicable diseases can occur under the influence of different risk factors. According to the research results, more than half of respondents knows that tobacco products and insufficient consumption of vegetables cause cardiovascular and malignant diseases. More than one third of respondents knows that alcohol and physical inactivity cause cardiovascular diseases. Approximately half of them are not sure that alcohol products and consumption of industrial products or sweet beverages cause malignant diseases.

There are socio-demographic differences in attitudes towards the effectiveness of health education material. Usefulness of printed and video health education material is strongly confirmed by respondents living in poorer socio-economic conditions while those highly educated strongly agree about the usefulness of health educational material in the prevention of diabetes and respiratory diseases. Respondents living in better life conditions have positive attitudes towards using health educational material for the improvement of own health.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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