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THE RELATIONSHIP BETWEEN EDUCATIONAL LEVEL AND CITIZEN PREPAREDNESS TO RESPOND TO NATURAL DISASTERS

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Abstract: This paper presents the results of quantitative research into the relationship between educational level and preparedness of citizens to respond to a natural disaster caused by the flood. Starting from the local communities in Serbia that are vulnerable to flooding, 19 of them were selected randomly out of 150 municipalities and 23 cities and the city of Belgrade. In survey research conducted in 2015, which included 2,500 respondents, a test strategy in households was applied with the use of a multi-stage random sample. The research results indicate that there is a statistically significant relationship between educational level and the following variables: preventive measures; financial funds; engaged in the field; engaged in a reception center; visiting flooded areas; heavy rains; river level rise; and the level of preparedness, supplies in the home; radio-transistor; flashlight; shovel; hack; apparatus for firefighting; supplies in the car; first aid kit in the home and so on. On the other hand, there is no relationship with variables: media reports, information in religious community, on television, education on radio, informal education system. The research results can be used to improve citizen preparedness to respond to disasters caused by flooding. The survey set out recommendations for increasing the level of preparedness to respond in such situations with regard to the educational level of citizens.

Key words: security, natural disasters, floods, citizens, preparedness

Introduction

The preparedness of citizens to respond to natural disasters is a very topical issue in the theory of natural disasters (Cvetković & Dragicević, 2014; Cvetković, 2016; Kreibich et al., 2011; Muttarak & Pothisiri, 2013; Tomio, Sato, Matsuda, Koga, & Mizumura, 2014; Cvetković, 2015a; Cvetković, 2015b; Cvetković, 2015c). Thereby, preparedness means any preventive action taken by an individual, household, community or country before and during disasters, including searching, processing and sharing of relevant information on preventive activities, keeping plans, supplies and equipment (Russell, Goltz, & Bourque, 1995; Cvetković, 2015b).

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Examining the impact of knowledge (Cvetković & Stanišić, 2015; Panić, Kovačević-Majkić, Miljanović, & Miletić, 2013; Jakovljević, Cvetković, & Gačić, 2015) and education on the preparedness of citizens to respond to natural disasters, the authors have come to various conclusions. Tomio et al. (2014) found that citizens with higher levels of education were more prepared to respond to natural disasters. In a study conducted in the USA, it was found that with the level of education, public index of preparedness to respond rises proportionately (FEMA, 2009). In Scotland, a study was conducted on impacts of flood risks and floods on society (Werritty, Houston, Ball, Tavendale, & Black, 2007). The results suggest that respondents think about floods and preparations for floods due to: visit to flooded areas, talks about floods, media reports about floods, river level rise. Tanaka (2005) examined in which way the knowledge on earthquakes influences raising the level of preparedness of population to respond to such a disaster. Finnis, Johnston, Ronan, and White (2010) found that there is a positive correlation between participation in educational programs and higher levels of household preparedness to respond to disasters. Kohn et al. (2012) point out that there are significant variations in the results of research relating to the impact of education on the level of preparedness of citizens to respond to disasters. Some studies indicate that individuals with high levels of specific knowledge are more prepared for such events (Hurnen, 1997; Mishra & Suar, 2007). Edwards (1993) indicates that households with higher levels of education to a greater extent will adapt to implementation of necessary measures of preparedness. Faupel, Kelley, and Petee (1992) in the study confirm the correlation between participation in educational programs relating to natural disasters and the level of preparedness of citizens to respond. Johnston et al. (Johnston, Becker, & Paton, 2012) indicate that the traditional educational programs on natural disasters focused on passive information provide a very low level of awareness and motivation of citizens to raise the level of preparedness to respond. In the research results, Cvetković confirms the connection between educational level and familiarity with responsibilities of the police and the evacuation routes during natural disasters (Cvetković, 2016; Cvetković & Gačić, 2016).

Starting from the results of the previous research, the paper examines the relationship between educational level and the preparedness of citizens to respond to a natural disaster caused by the flood in the Republic of Serbia.

Research methodology

Operationalization of the theoretical concept of preparedness to respond gave three dimensions (perception, knowledge and supplies) that have been studied determining a number of variables for each one (Figure 1). Perception of

preparedness to respond includes the following variables: preparedness at different levels; barriers to raise the level of preparedness; expectation of assistance from various categories of people and organizations; assessment of efficiency of first responders. Knowledge was examined through variable relating to: level of knowledge; flood risk map; familiarity with location of valves and handling; readiness for training and different ways of education, way of obtaining information about floods. Finally, the third dimension, that is, supplies relate to the possession of oral/written plans, keeping supplies of food and water, transistor radio, flashlight, hack, shovel, hoe and spade, first aid kit, insurance.

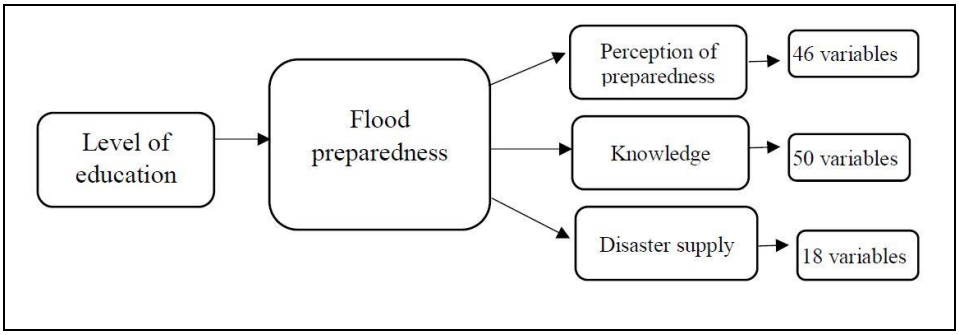

Figure 1. Research design

Bearing in mind the subject of research, local communities endangered by flood were selected for the realization of the study. In accordance with the conditions under which the results of scientific research can be generalized to the entire population of Serbia, the survey was conducted on the territory of a large number of local communities varied in their demographic and social characteristics. Urban and rural communities in different parts of Serbia were included: Obrenovac, Šabac, Kruševac, Kragujevac, Sremska Mitrovica, Priboj, Batočina, Svilajnac, Lapovo, Paraćin, Smederevska Palanka, Jaša Tomić, Loznica, Bajina Bašta, Smederevo, Novi Sad, Kraljevo, Rekovac and Užice. Detailed overview of characteristics of included local communities is shown in the Table 1.

Sample

The study population consisted of all adult residents of the local communities in which floods occurred or there is a risk of flood to occur. The sample size was complied with the geographical and demographic size of the community (Table 1 and Figure 2). Bearing in mind all the local communities in Serbia endangered by flood, 19 of the 150 municipalities were randomly selected and 23 cities and the city of Belgrade. A questioning strategy in households was applied in the survey with the use of a multi-stage random sample.

The first step relating to the primary sample units included determination of segments of the community in which to do research. This process was accompanied by the creation of map and determination of the percentage share of each such segment in the total sample. The second step relating to the research cores determined streets or sections of streets on the level of the primary units of samples. Each core of the research was determined as the path with specified start and end points of movement. The next step determined households in which the survey was conducted. The number of households was harmonized with population. The final step was related to the selection of respondents within the predefined household. The selection of respondents was conducted following the procedure of next birthday for adult members of household. The very process of interviewing for each local community was performed during three days in a week (including weekends) at different times of the day. The study surveyed a total of 2,500 citizens.

Table 1. Overview of the characteristics of the local communities in which the survey was conducted

Local community	Total square area	Localities	Population	Number of households
Obrenovac	410	29	72,682	7,752
Šabac	797	52	114,548	19,585
Kruševac	854	101	131,368	19,342
Kragujevac	835	5	179,417	49,969
Sremska Mitrovica	762	26	78,776	14,213
Priboj	553	33	26,386	6,199
Batočina	136	11	11,525	1,678
Svilajnac	336	22	22,940	3,141
Lapovo	55	2	7,650	2,300
Paraćin	542	35	53,327	8,565
Smed. Palanka	421	18	49,185	8,700
Sečanj	82	1	2,373	1,111
Loznica	612	54	78,136	6,666
Bajina Bašta	673	36	7,432	3,014
Smederevo	484	28	107,048	20,948
Novi Sad	699	16	346,163	72,513
Kraljevo	1,530	92	123,724	19,360
Rekovac	336	32	10,525	710
Užice	667	41	76,886	17,836
Total: 19	10,784	634	1,500,091	283,602

Source: Statistical Office of the Republic of Serbia, 2011.

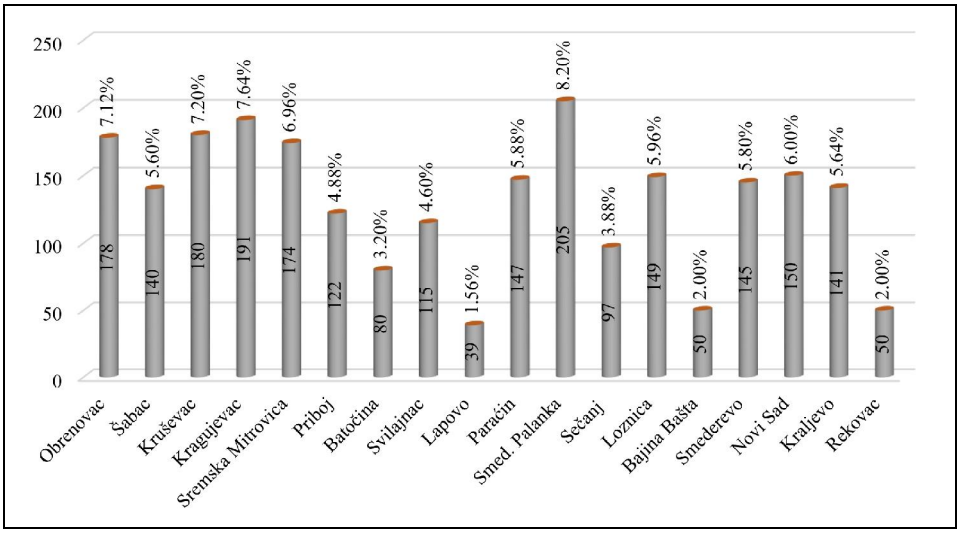

Figure 2. Distribution of respondents included in the sample by local communities

Observing the educational structure of citizens included by the sample, it is noted that the majority of the population have completed a four-year secondary education, 41.3%. The smallest number of citizens has completed master, 2.9% and doctoral studies, 0.4%. There are more men than women with a three-year secondary education and a doctorate, while there are more women with university degrees, master degrees, and four-year secondary education (Figure 3).

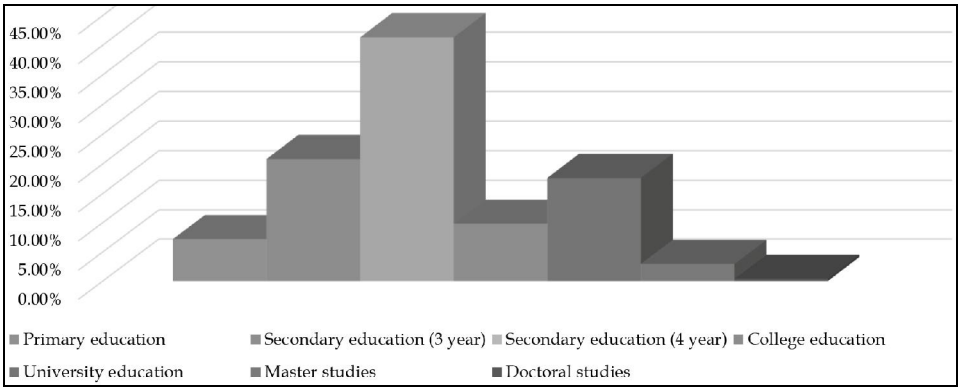

Figure 3. Percentage composition of the sample of surveyed citizens according to their education

The implementation of the sampling techniques provided a solid representation of the sample, while sample size gave reliability of reasoning on the basic set — population.

Instrument and data analysis

Development of valid and reliable instrument included several steps. The first step identified all of the research using scales for measuring preparedness of citizens to respond to disasters. The second step determined the dimensions of preparedness of citizens to respond to floods. The third step included the aforementioned operationalization of preparedness to respond and deciding on the three basic dimensions (perception of preparedness to respond, knowledge and supplies). The fourth step set variables for each dimension (perceptions of preparedness to respond — 46 variables; knowledge — 50 and supplies — 18), and then for each variable a question was taken, adapted or specially designed in the instrument. The fifth and final steps included preliminary (pilot) survey in Batočina on a sample of 50 respondents with the aim of checking constructed instrument (its internal compatibility of the scale, i.e. the degree of similarity of the items of which it is composed, as well as whether the instructions, questions and values on scales are clear).

Statistical analysis of collected data was performed at IBM's software package SPSS. Chi-square test of independence ($\chi 2$) was used to examine the relationship between educational level and categorical variables on perception, knowledge and possession of supplies and plans for natural disaster caused by the flood. To test the connection between educational level and continuous dependent variables on the perception, knowledge and possession of supplies and plans for natural disasters caused by floods, the one-way analysis of variance was used.

Research results

The results of Chi-square test of independence ($\chi 2$) showed a statistically significant relationship between the level of education and the following variables: preventive measures ($x^2 = 38.09$, $p = 0.000$); financial funds ($x^2 = 80.17$, $p = 0.000$); engaged in the field ($x^2 = 58.95$, $p = 0.000$); engaged in a reception center; ($x^2 = 22.35$, $p = 0.001$); visiting to flooded areas ($x^2 = 24.19$, $p = 0.000$); long-lasting rain ($x^2 = 28.31$, $p = 0.000$); river level rise ($x^2 = 14.70$, $p = 0.000$); and the level of preparedness ($x^2 = 117.62$, $p = 0.000$). On the other hand, there was no statistically significant relationship with variable: media reports (Table 2).

Analysis of the results shows that citizens who have completed doctoral studies are largely still unprepared, but they intend to improve their preparedness in the

next 6 months. Increasing level of water in rivers, lakes, etc. is at last place what encourages them to think about preparedness for responding.

Preventive measures to reduce the tangible consequences of floods largely were undertaken by citizens who have completed master studies. Also, they would in the highest percentage give money to help flood victims and engage in providing assistance to the affected population. Visit to flooded areas has the greatest effect to them to think on preparedness for response.

Citizens with college degrees would engage in highest percentage in reception centers for affected citizens. Long-lasting rains encourage them to think about their own preparedness to respond to disasters. It is interesting to note that they in the highest percentage do not do anything to prepare themselves to respond.

Citizens with primary education would give money to help victims affected by floods in the lowest percentage. Also, they would not engage in providing assistance to the affected population and in a reception center. Visit to flooded areas does not encourage them to think about preparedness for response. They have not started to prepare for responding to disasters caused by flooding. Citizens who have completed high/three-year school in the highest percentage undertake various activities to raise preparedness level.

Table 2. Results of the chi-square test of independence (÷2) of the level of education and the mentioned variables on perception of preparedness for response

	Value	df	Asymp. Sig. (2-sided)	Cramers V
Preventive measures	**38.092**	**12**	**.000***	**.092**
Funds	**80.174**	**6**	**.000***	**.185**
Engaged on the field	**58.951**	**6**	**.000***	**.158**
Engaged at reception centre	**22.355**	**6**	**.001***	**.097**
Tour of flooded places	**24.193**	**6**	**.000***	**.102**
Heavy rains	**28.315**	**6**	**.000***	**.110**
Raising river level	**14.708**	**6**	**.023***	**.079**
Media reports	10.915	6	.091	.069
Preparedness level	**117.620**	**30**	**.000***	**.101**

* Statistically significant correlation — $p \leq 0.05$

One-way analysis of variance (ANOVA) examined the effect of the level of education of citizens on the dependent continuous variables on perception of preparedness to respond. Based on the results, there is a statistically significant difference between the mean values of those groups in the following continuous dependent variables: household preparedness ($F = 2.74$, $p = 0.012$, ek = 0.006); first responders ($F = 4.71$, $p = 0.000$, ek = 0.011); I am not affected ($F = 2.61$, $p = 0.016$, ek = 0.0063); It is very expensive ($F = 3.56$, $p = 0.002$, ek = 0.008); self-organized individuals ($F = 3.19$, $p = 0.004$, ek = 0.0078); Help would not mean

much (F = 5.74, p = 0.000, ek = 0.015); Duty of state bodies (F = 4.30, p = 0.000, ek = 0.110); individual preparedness (F = 3.69, p = 0.002, ek = 0.009); preparedness of local community (F = 2.874, p = 0.012, ek = 0.006); national preparedness (F = 2.82, p = 0.014, ek = 0.004); personal abilities (F = 2.31, p = 0.038, ek = 0.004); importance of taken measures (F = 2.25, p = 0.043, ek = 0.022); I do not have time for that (F = 9.90, p = 0.000, ek = 0.004); It will not influence on safety (F = 5.18, p = 0.000, ek = 0.006); I'm not capable (F = 3.26, p = 0.006, ek = 0.0091); I cannot prevent it (F = 3.97, p = 0.001, ek = 0.069); household members (F = 2.96, p = 0.010, ek = 0.010); neighbors (F = 3.66, p = 0.002, ek = 0.016); religious community (F = 3.79, p = 0.002, ek = 0.0045); Police (F = 2.38, p = 0.034, ek = 0.004); first responders (F = 6.82, p = 0.000, ek = 0.0144); emergency medical service (F = 7.53, p = 0.000, ek = 0.009); duty of state bodies (F = 6.33, p = 0.000, ek = 0.010); citizens from flooded areas (F = 4.07, p = 0.001, ek = 0.0090); it is too costly (F = 3.54, p = 0.003, ek = 0.021); police efficiency (F = 7.42, p = 0.000, ek = 0.086); efficiency of first responders (F = 4.88, p = 0.000, ek = 0.011); efficiency of emergency medical service (F = 6.024, p = 0.000, ek = 0.010); efficiency of the army (F = 4.94, p = 0.000, ek = 0.012); efficiency of staff for emergency situations (F = 3.58, p = 0.003, ek = 0.014).

Subsequent comparison using Tukey HSD showed that citizens with a university degree (M = 3.10, SD = 0.989) recorded a higher level of individual preparedness to respond to floods compared to citizens with secondary/three-year degree (M = 2.84, SD = 1.101). A higher level of preparedness of household to respond to floods recorded citizens with primary education (M = 3.10, SD = 0.947) compared with citizens with master's degree (M = 2.85, SD = 0.905). Individuals with a university degree (M = 2.90, SD = 1.029) recorded a higher level of assessment of individual preparedness to respond to floods compared to citizens with secondary/three-year education (M = 2.77, SD = 1.158).

Speaking about the reasons for not taking preventive measures to reduce the consequences of floods, it was found that: people with secondary/three-year education (M = 2.85, SD = 1.34) to a greater extent state "I think that first responders will help me anyway so such measures are necessary" compared to citizens who have completed master studies (M = 2.29, SD = 1.05); citizens with secondary/four-year education to a greater extent state "I think that such measures are very expensive" as a reason for not taking preventive measures in relation to citizens with a university degree (M = 2.57, SD = 1.24); citizens with secondary/three-year education (M = 2.77, SD = 1.42) to a greater extent state "I am not capable of such a thing" as a reason for not taking preventive measures in relation to citizens with primary education (M = 2.33, SD = 1.30); citizens with

secondary/four-year education to a greater extent state "I have no support from the local community" as a reason for not taking preventive measures in relation to citizens who have completed master studies (M = 2.31, SD = 1.09).

After examination of barriers for taking preventive measures, expectation of help in the first 72 hours after occurrence of natural disaster caused by flood was examined. Subsequent comparisons show that people with primary education to a greater extent, expect assistance from household members (M = 4.15, SD = 1.28) compared to citizens who have completed doctoral studies (M = 2.78, SD = 0.83). Citizens with secondary/three-year education to a greater extent expect help from neighbors (M = 3.71, SD = 1.31) compared to citizens with secondary/four-year education (M = 3.43, SD = 1.25). The obtained results are interesting when it comes to the expectation of help from first responders. Namely, citizens with college degree to a greater extent expect help from the police (M = 3.39, SD = 1.34) compared to citizens with primary education (M = 3.00, SD = 1.39). Also, citizens with college degree (M = 3.87, SD = 1.18) to a greater extent expect help from first responders compared to citizens with primary education (M = 3.34, SD = 1.35). When it comes to emergency medical service, citizens with secondary/three-year education (M = 3.56, SD = 1.28) to a greater extent expect help compared to citizens with secondary/four-year education (M = 3.34, SD = 1.23). Among self-organized individuals, citizens who have completed master studies to a greater extent expect help (M = 3.55, SD = 1.25) compared to citizens with secondary/three-year education (M = 2.97, SD = 1.39).

Knowledge of local flood risks is of crucial importance for taking preventative measures. The results show that citizens with a university degree (M = 3.08, SD = 1.20) recorded a higher level of knowledge in relation to citizens with primary education (M = 2.47, SD = 1.33).

Starting from importance of engaging every citizen in voluntarily assisting vulnerable people due to consequences of floods, the reasons for their failure to engage were examined. Individuals with primary education (M = 3.07, SD = 1.45) to a greater extent state "My help would not mean much" as a reason for voluntary disengagement in relation to citizens with college education (M = 2.35, SD = 1.15). Citizens with primary education (M = 2.94, SD = 1.26) to a greater extent state "Others have already helped enough" as a reason for disengagement compared to citizens who have college degrees (M = 2.58, SD = 1.16). Individuals with primary school (M = 3.30, SD = 1.15) to a greater extent state "it is the job of state authorities" as a reason for not taking preventive measures in relation to citizens with a university degree (M = 2.92, SD = 1.24).

When it comes to assess the efficiency of response of first responders in natural disasters caused by flooding, the results show that people with secondary/four-year (M = 3.66, SD = 1.30) education to a greater extent assess the efficiency of response compared to citizens who have completed doctoral studies (M = 2.33, SD = 1.11). On the other hand, people with secondary/four-year (M = 3.38, SD = 1.38) education to a greater extent assess the efficiency of response of stuff for emergency situations in relation to citizens with a university degree (M = 3.58, SD = 1.26).

The results of Chi-square test of independence ($\chi 2$) showed a statistically significant relationship between the level of education and the following variables on knowledge: knowledge of the flood ($x^2 = 56.71$, $p = 0.000$); knowledge of safety procedures ($x^2 = 33.52$, $p = 0.000$); evacuation ($x^2 = 55.15$, $p = 0.000$); education at school ($x^2 = 29.98$, $p = 0.000$), within family ($x^2 = 43.40$, $p = 0.000$), at work ($x^2 = 113.32$, $p = 0.000$); consent to evacuation ($x^2 = 30.84$, $p = 0.000$); help - elders, disabled ($x^2 = 35.89$, $p = 0.000$); neighbors - individually ($x^2 = 42.51$, $p = 0.000$); flood risk map ($x^2 = 30.78$, $p = 0.000$); official warning ($x^2 = 50.65$, $p = 0.000$); potential infection ($x^2 = 71.73$, $p = 0.000$); water valve ($x^2 = 62.02$, $p = 0.000$), gas valve ($x^2 = 50.27$, $p = 0.000$), electricity switch ($x^2 = 47.76$, $p = 0.000$); handling water valve ($x^2 = 39.89$, $p = 0.000$), handling gas valve ($x^2 = 41.79$, $p = 0.000$), handling electricity switch ($x^2 = 35.64$, $p = 0.000$); Information from household members ($x^2 = 23.92$, $p = 0.001$), neighbors ($x^2 = 40.41$, $p = 0.000$), friends ($x^2 = 21.10$, $p = 0.001$), relatives ($x^2 = 22.52$, $p = 0.001$); information at school ($x^2 = 47.78$, $p = 0.000$) at faculty ($x^2 = 131.46$, $p = 0.000$), informal system ($x^2 = 26.88$, $p = 0.000$), at work (x2 = 32 23, $p = 0.000$), radio ($x^2 = 23.91$, $p = 0.001$), the press ($x^2 = 14.95$, $p = 0.021$), over the Internet ($x^2 = 84.23$, $p = 0.000$); trained ($x^2 = 23.77$, $p = 0.001$); desire for training ($x^2 = 47.46$, $p = 0.000$); education through television ($x^2 = 63.15$, $p = 0.000$), video games ($x^2 = 32.01$, $p = 0.000$), the Internet ($x^2 = 89.85$, $p = 0.000$), lectures ($x^2 = 60.46$, $p = 0.000$) (Table 3). On the other hand, there was no statistically significant relationship with variables: information in a religious community, information on television, education on the radio, informal system (Table 3).

Based on the results, people who have completed master studies in relation to citizens of other levels of education know best what flood is and in the highest percentage would evacuate to the upper floors of the house and in rented apartments. The highest number point out that someone at work and in the family educated them how to act in natural disaster caused by flood. Educational information about natural disasters were given through non-formal education systems, radio and the press. They would like to be educated through the radio shows and video games. They are motivated to attend necessary training.

Citizens who have a university degree best know safety procedures, viruses and infections that accompany specified natural disaster. In fact, in the highest percentage they state that someone at school educated them about floods. They would firstly agree to evacuate and know best what kind of help is required by elders, disabled and infants. They point out that they get educational information on natural disasters over the Internet.

Individuals with primary educations in the highest percentage would evacuate to friends' and neighbors' places. Thereby, they specifically state that their neighbors could self-rescue. They know best estimates of local flood risks and what needs to be done after the official warning about the approach of the flood wave. In addition, they know the exact place of water valve, gas valve and electricity switch. They have received educational information about floods from household members and neighbors. On the other hand, the lowest percentage of them knows what the flood is. A large number would not agree to evacuate to the upper floors of the house. They point out that they have not been educated in school, family and work. They are not familiar with viruses and infections that accompany period after flooding. The lowest percentage wants to be trained for acting in such situations. They point out that they have not received education from friends, at faculty, in the press. They would not want to be educated through lectures and the Internet. They do not know safety procedures.

Citizens with college education prefer to evacuate to a reception center and they have acquired educational information about floods over the religious community and television.

Citizens with secondary/three-year education know best where elders, disabled and infants live. Also, they know how to handle the main switch of electricity in the household. They have acquired educational information about floods get at school. On the other hand, people with secondary/four-year education have acquired educational information from friends and they know how to handle the gas valve.

Table 3. Results of Chi-square test of independence (÷2) of educational level of respondents and knowledge as an element of preparedness to respond

	Value	df	Asymp. Sig. (2 - sided)	Cramer's v
Knowledge of the flood	**56.712**	**12**	**.000***	**.109**
Knowledge of safety procedures	**33.522**	**12**	**.001***	**.085**
Evacuation	**55.159**	**24**	**.000***	**.079**
Education at school	**29.981**	**12**	**.003***	**.080**
Education in family	**43.402**	**12**	**.000***	**.096**
Education at work	**113.325**	**12**	**.000***	**.157**
Seniors, handicapped and infants	20.715	12	.055	.066
Consent to evacuate	**30.849**	**6**	**.000***	**.114**
Help – seniors, handicapped	**35.896**	**12**	**.000***	**.086**
Neighbours - independently	**42.510**	**12**	**.000***	**.095**
Flood risk map	**30.783**	**12**	**.002***	**.080**
Flood risk map	**50.653**	**12**	**.000***	**.105**
Potential infections	**71.335**	**12**	**.000***	**.123**
Water vent	**62.024**	**12**	**.000***	**.114**
Gas vent	**50.276**	**12**	**.000***	**.115**
Switch for energy	**47.766**	**12**	**.000***	**.102**
Handling the water vent	**39.893**	**12**	**.000***	**.091**
Handling the gas vent	**41.795**	**12**	**.000***	**.103**
Handling the switch for energy	**35.644**	**12**	**.000***	**.088**
Information from family members	**23.923**	**6**	**.001***	**.101**
Information from neighbours	**40.419**	**6**	**.000***	**.132**
Information from friends	**24.103**	**6**	**.001***	**.101**
Information from relatives	**22.520**	**6**	**.001***	**.098**
Information at school	**47.788**	**6**	**.000***	**.143**
Information at college	**131.463**	**6**	**.000***	**.237**
Information through the informal system	**26.882**	**6**	**.000***	**.108**
Information at work	**32.232**	**6**	**.000***	**.117**
Information in religious community	19.513	6	.003	.091
Information on TV	6.020	6	.421	.050
Information on radio	**23.918**	**6**	**.001***	**.101**
Information from the press	**14.954**	**6**	**.021***	**.080**
Information over the Internet	**84.230**	**6**	**.000***	**.189**
Trained	**23.779**	**6**	**.001***	**.100**
Willingness to train	**47.464**	**12**	**.000***	**.101**
Willingness to train	**63.153**	**6**	**.000***	**.164**
Education through the radio	11.818	6	.066	.071
Education through the video games	**32.013**	**6**	**.000***	**.118**
Education through the Internet	**89.853**	**6**	**.000***	**.197**
Education through lectures	**60.467**	**6**	**.000***	**.161**
Education through lectures	8.111	6	.230	.059

* Statistically significant correlation — $p \leq 0.05$

The results of Chi-square test of independence ($\chi 2$) showed a statistically significant relationship between educational level and the following variables

relating to supplies: supplies at home ($x^2 = 28.18$, $p = 0.005$); radio-transistor ($x^2 = 22.49$, $p = 0.001$); flashlight ($x^2 = 18.96$, $p = 0.004$); shovel ($x^2 = 23.18$, $p = 0.001$); hack ($x2 = 18.54$, $p = 0.005$); apparatus for firefighting ($x^2 = 39.06$, $p = 0.001$); supplies in the car ($x2 = p = 0.001$); first aid kit in the home ($x^2 = 71.66$, $p = 0.001$); first aid kit in the vehicle ($x^2 = 36.90$, $p = 0.008$); response plan ($x2 = 58.15$, $p = 0.000$); discussion on the plan ($x^2 = 26.70$, $p = 0.001$); copies of documents ($x^2 = 39.43$, $p = 0.000$); insurance ($x2 = 55.89$, $p = 0.000$). On the other hand, there was no statistically significant relationship with the following variables: food supplies, water supplies, hoe and spade, restocking (Table 4).

Based on the results, citizens with master's degre in the highest percentage possess supplies in case of natural disasters, transistor radio, flashlight, copies of financial and other personal documents. On the other hand, people who have a university degree in the highest percentage have first aid kit in the home, vehicle and unwritten plan for responding.

Citizens with secondary/ three-year education in the highest percentage have a shovel, hack and written plan for responding. In the lowest percentage they have a hack and insurance against flooding. Citizens with secondary/four-year education in the lowest percentage have a transistor radio, shovel, first aid kit in the vehicle, supplies in the car.

Table 4. Results of Chi-square test of independence (÷2) between education, keeping supplies and response plans

Variables	value	df	Asymp. Sig. (2 - sided)	Cramers v
Supplies at home	**28.180**	**12**	**.005***	**.076**
Food supplies	13.285	10	.208	.094
Water supplies	19.072	12	.087	.116
Radio-transistor	**22.491**	**6**	**.001***	**.135**
Flashlight	**18.967**	**6**	**.004***	**.122**
Shovel	**23.185**	**6**	**.001***	**.135**
Hack	**18.547**	**6**	**.005***	**.121**
Hoe and spade	7.770	6	.255	.078
Apparatus for fire-fighting	**39.064**	**6**	**.000***	**.182**
Restocking	15.989	12	.192	.079
Supplies in car	**71.668**	**18**	**.000***	**.103**
First aid kit at home	**36.908**	**12**	**.000***	**.090**
First aid kit in vehicle	**41.354**	**12**	**.000***	**.106**
First aid kit – easily accessible	6.956	12	.860	.042
Response plan	**58.153**	**18**	**.000***	**.091**
Discussion of the plan	**26.876**	**12**	**.008***	**.077**
Copies of documents	**39.431**	**12**	**.000***	**.095**
Insurance	**55.891**	**12**	**.000***	**.109**

* Statistically significant correlation — $p \leq 0.05$

Conclusion

Quantitative research of relationship between educational level and citizen preparedness for responding to a natural disaster produce diverse conclusions in relation to educational level of citizens:

- Primary education — the highest percentage of citizens would evacuate to friends' and neighbors' places. Thereby, they specifically state that their neighbors could self-rescue. They know best estimates of local flood risks and what needs to be done after the official warning about the approach of the flood wave. In addition, they know the exact place of water valve, gas valve and electricity switch. They have received educational information about the flood from household members and neighbors.

- Secondary education — the highest percentage of people have a shovel, hack and written plan for responding. They best know where the elders, disabled and infants live. Also, they know how to handle the main switch of electricity in the household. They have received educational information about floods at school. Citizens with secondary/three-year education to the greatest extent undertake various activities to raise preparedness level.

- College education — citizens would evacuate in a reception center and educational information about floods have acquired over religious community and television. Citizens with college degree would engage in reception centers for vulnerable citizens in the highest percentage. Long-lasting rains encourage them to think about their own preparedness for responding to disasters. It is interesting to note that they in the highest percentage do not do anything to prepare themselves for responding.

- University education — citizens with university degree in the highest percentage know safety procedures, viruses and infections that accompany specified natural disaster. In fact, the highest percentage states that someone educated them on flood at school. They would firstly agree to evacuate and know best what kind of help elders, disabled and infants require. They point out that they have acquired educational information on natural disasters over the Internet.

- Master studies — in the highest percentage have supplies in case of natural disasters, a transistor radio, flashlight, copies of financial and other personal documents. Citizens who have completed master studies in relation to citizens of other levels of education know best what flood is and in the highest percentage would evacuate to the upper floors of the house and in rented

apartments. The highest percentage point out that someone at work and in the family educated them on how to act in a natural disaster caused by the flood. Educational information about natural disasters were given through non-formal education systems, radio and the press. They would like to be educated through the radio shows and video games. They are motivated to attend necessary training.

- Doctoral studies — citizens who have completed doctoral studies in the highest percentage are still unprepared, but they intend to improve their preparedness in the next 6 months. Increasing level of water in rivers, lakes, etc. encourages them least to think about preparedness for responding.

According to the results of research, it is necessary to influence the citizens to take preventive measures and to familiarize themselves with safety procedure. In order to improve citizen preparedness, photos, video clips and educational programs can be used. Generally speaking, the most important step towards improving preparedness relates to design and implementation of specific teaching topics and development of certain practical skills in primary and secondary school education that are relevant for responding in such situations. Of course, it could be implemented within introduction of the subject "Safety culture" in which students would acquire a range of different knowledge about natural disasters and how to react. In addition to the formal education system, at the level of local communities, specific seminars, courses and training programs can be organized on a two-month level for citizens living in areas endangered by natural disasters. The state could also invest certain funds to provide most vulnerable citizens with supplies in order to prevent occurrence of serious consequences.

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