THE SURVEY OF CITIZEN ATTITUDES TOWARD PREPAREDNESS FOR DISASTERS CAUSED BY WILDFIRES: CASE STUDY: PRIJEPOLJE

Original Scientific Article

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Vladimir M. Cvetković[1]
Faculty of Security Studies, University of Belgrade

Bogdan Filipović
Scientific-Professional Society for Disaster Risk management, Belgrade

Abstract: Starting with the severity of wildfires and the fact that about one third of the territory of Polimlje consists of forests and that wildfires are relatively common in Prijepolje, the aim of our research is to examine the influencing factors of certain independent variables (sex, marital status, age, education, etc.) on different dimensions of preparedness for a disaster caused by wildfires. By multi-stage random sampling, starting with the theory of planned behavior, a survey was conducted in 15 settlements within the municipality of Prijepolje on a sample of 197 respondents. The results of the survey indicate a low level of preparedness among the inhabitants of Prijepolje (citizens generally believe that they do not have the necessary knowledge to respond to disasters caused by wildfires and are generally not interested in attending training; they do not have plans or equipment for response and the majority of them think wildfires do not pose any danger to them). Also, the influence of certain factors on the attitudes toward preparedness was unequivocally determined. The scientific significance of the survey is reflected in the creation of preconditions for the improvement of empirical knowledge in the area of disaster risk management, while the practical significance is reflected in the creation of preconditions for improving the safety of citizens from wildfires.

Keywords: disasters, wildfire, preparedness, citizens, attitudes, Prijepolje.

INTRODUCTION

Wildfires are often the causes of forest destruction and lead to enormous environmental and economic damage, as well as the loss of human lives. There is a growing human influence on their occurrence, control and suppression. Scientists dealing with this problem have noticed that fires most often occur

1 Corresponding author: Dr. Vladimir M. Cvetković, assistant professor at the Faculty of Security Studies, University of Belgrade E-mail: vmc@fb.bg.ac.rs.

in summer, when air temperatures are relatively high and when there is no precipitation. There are years when the increased activity of these disasters may also occur in early spring or late autumn. About 5% of fires are attributed to natural causes, while 95% of fires are caused by human activities such as carelessness, work on agricultural land and pyromania (Radovanović, 2008). The size of the burned area and the intensity of the fire depend on the type of vegetation that is endangered by fire. The dimensions of these natural disasters can often be of such proportions that they are visible from space (Ignjić, 2017). The behavior of wildfires depends on air temperature, wind, precipitation and relative humidity. After a long rainy period, there is an increase in moisture in burning materials.

Based on the analysis of wildfires in the period 2000-2009, it may be concluded that the largest areas affected by fire are located in Eastern and Southeastern Serbia and that it is noticeable that these areas have significantly higher average ten-year temperatures than the average for Central Serbia (Aleksic and Janičić, 2011). Regarding the situation in the municipality of Prijepolje, a large fire was recorded in a pine forest near the general hospital in 2017. The fire engulfed the forest in the settlement of Miljanovica; the village of Rasno and the settlement of Sretež were also endangered. Prior and Eriksen indicated that greater social cohesion among community members contributes to a greater level of preparedness for disasters caused by wildfires (Prior & Eriksen, 2013). Additionally, Monroe et al. conducted a research on the experiences of residents of 15 local communities who improved their disaster preparedness (Monroe et al., 2013). They came to a conclusion that good communication is the key to good natural risk management and that educational programs that foster interaction between community members and mutual work need to be designed (Agrawal & Monroe, 2006). Newman et al. (Newman et al., 2013) examined risk perception among the residents of local communities affected by wildfires and hurricanes and concluded that the residents are more aware of the dangers posed by hurricanes than by wildfires. Eriksen et al. addressed wildfire protection and rescue plans in Australia and indicated that such plans should include an explanation of the actions of all household members and recommendations for multiple unforeseen circumstances, given that proper decision making may be affected in these situations due to the impact of insecurity, fear and adrenaline on cognitive function (Eriksen et al., 2016). Fabac et al. (2015) pointed out the dissatisfaction of the citizens in Croatia with the organization of logistical support in the fight against wildfires. Given that fires are inevitable in many parts of Australia, numerous studies on to the preparedness of residents for disasters caused by wildfires in this area have been conducted (McGee & Russell, 2003), including a number of studies related to preparedness for other disasters (Aleksandrina et al., 2019; Cvetkovic et al., 2020; Ocal et al., 2020; Cvetković & Martinović, 2020). the factors whose influence has been confirmed are knowledge of wildfires, the level of individual responsibility and self-confidence.

For this reason, this article seeks to examine the factors influencing the attitudes of citizens toward preparedness to respond to a disaster caused by wildfires. The aim of this article is to scientifically describe the levels and factors influencing the selected dimensions of response preparedness.

RESEARCH METHODS

This survey seeks to examine the impact of the factors of certain independent variables (sex, marital status, age, education, occupation, income, the number of children in the family, the number of household members, etc.) on different dimensions of preparedness for a disaster caused by wildfires. The disaster preparedness of citizens includes several different dimensions, with research focusing on having knowledge of how to respond to wildfires and protection plans. Specifically, this research seeks to determine the impact of sex, age, marital status, ethnicity, health status, the length of residence (demographic characteristics), education, occupation, the number of children in the family, the number of household members, apartment comfort, income level (socio-economic characteristics) on the preparedness among the citizens of the municipality of Prijepolje for the catastrophe caused by wildfires. The statistical method was used to analyze the impact of demographic and socio-economic characteristics of citizens on the level of their preparedness for emergency situations caused by wildfires.

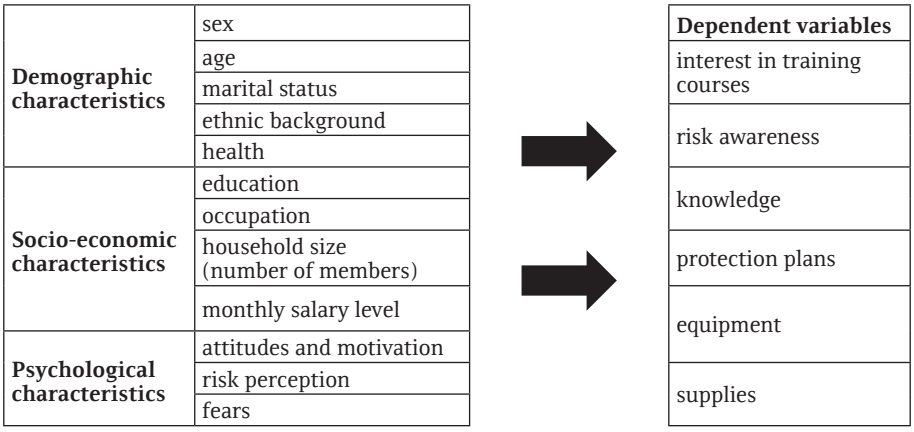

Figure 8. Conceptual model of the research objective.
Source: created by the authors.

Sample

By multi-stage random sampling, a survey was conducted in 15 settlements in the municipality of Prijepolje on a sample of 197 respondents. The survey

was conducted in the following 15 settlements: Sretež, Miljanovica, Rasno, Bjelobabe, Kamena Gora, Koševina, Bostani, Šarampov, Vakuf, Jabuka, Milaković, Ratajska, Seljašnica, Kolovrat and Ivanje. In the selected settlements, the households to be surveyed were randomly selected. The method of random selection is reflected in the developed procedure of selecting every other household on the right side of the street, starting from the smallest to the largest number. Then, of the selected households, the respondents were selected in alphabetical order according to their names. The sample included a large number of female respondents, aged 31 to 50, married, with secondary education diploma, employed and with a monthly salary ranging from 26,000 to 50,000 dinars (Table 1).

Table 1. Review of the sample structure N=197.

Variable	Category	N	%
Sex	Male	74	37,6
	Female	123	62,4
Age	Under 30	46	23,4
	From 31 to 50	97	49,2
	Over 50	54	27,4
Marital status	Not in a relationship	31	15,7
	In a relationship	30	15,2
	Married	121	61,4
	Engaged	5	2,5
	Widow/widower	10	5,1
Education	Primary school	11	5,6
	High school	107	54,3
	Higher school	34	17,3
	University	45	22,8
Occupation	Unemployed	22	11,2
	Employed	153	77,7
	Retired	22	11,2
Monthly salary	Up to 25.000	77	39,1
	26.000 – 50.000	93	47,2
	51.000 – 75.000	12	6,1
	Over 76.000	15	7,6
Risk perception	Yes	106	53,8
	No	56	28,4
	Not sure	35	17,8
Previous experience	Yes	61	31,0
	No	136	69,0

Research instrument

Designing and designing the survey questionnaire involved several steps. First, all studies using scales to examine the level of preparedness of citizens for disasters caused by wildfires were identified (Fabac et al., 2015; Eriksen et al., 2016; McGee & Russell, 2003). Then, based on the research collected, all measures that mean disaster preparedness were identified and a survey questionnaire was created for the purpose of this research. The questionnaire consisted of two parts: questions about respondents' demographic and socio-economic characteristics (15 questions) and questions about citizen readiness to respond to emergencies caused by wildfires (20 questions). To ensure that the questions in the questionnaire would be clear and understandable to the respondents, a pilot survey was conducted and the internal compliance of the questionnaire was checked in the statistical data processing program.

Method of data analysis

The preparation of data for further processing and analysis was initiated after the survey had Been conducted. The data collected were entered into the database and reviewed in order to identify possible errors. Further analysis of the data included the application of descriptive statistics, that is, the determination of the measures of central tendency (mean, median and mode), the measures of dispersion (variation interval, standard deviation and coefficient of variation) and variation form (symmetry and flatness). For the purposes of data analysis, descriptive static analyses and a chi square test were used.

RESULTS

The analysis of citizen preparedness for disasters included taking into consideration their self-assessment of their knowledge of responses to disasters caused by wildfires, their interest in attending additional trainings to enhance their preparedness, the possession of response plans and equipment, including the awareness of wildfire risk. 46.2% of the respondents answered "No" to the question "Do you think you have the necessary knowledge to respond to disasters caused by wildfires?", 34% answered "Yes", while 19.8% of the respondents were not sure how to self-assess their preparedness (Chart 1).

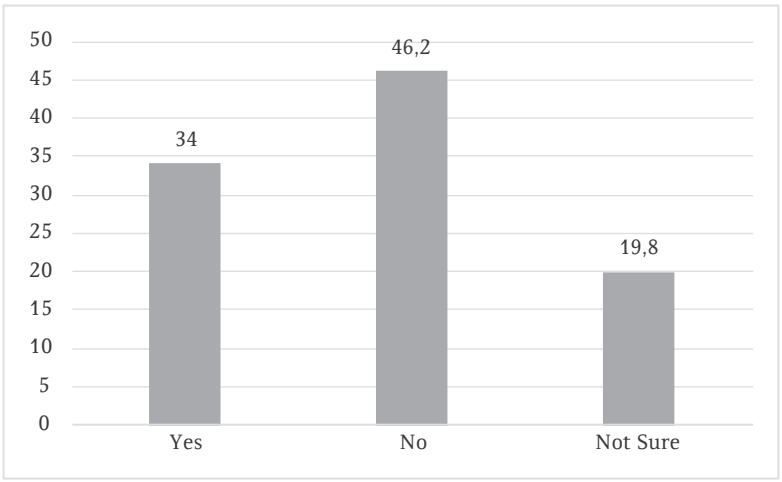

Chart 1. Percentage distribution of citizen attitudes regarding the self-assessment of their own knowledge of disaster response.

Thus, our results indicate that the majority of respondents do not believe they have adequate knowledge to respond to wildfires. We can assume that the reason for such a situation lies in the fact that the domestic public pays very little attention to examining and enhancing citizen preparedness to respond to disasters. Since there are no trainings organized for citizens, they do not have an opportunity to acquire necessary knowledge.

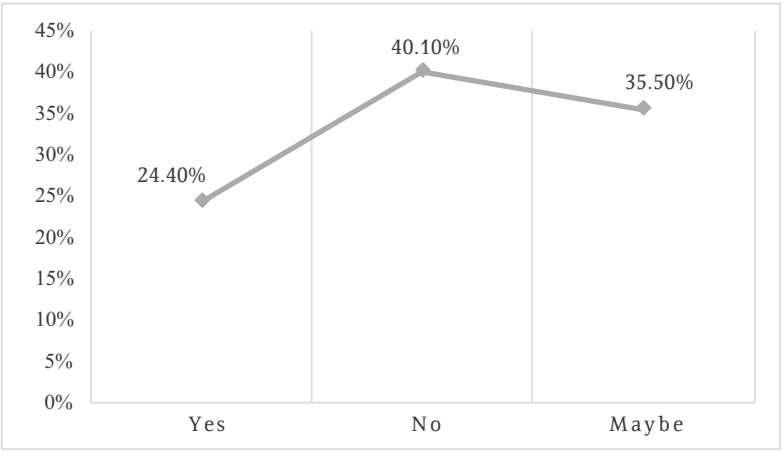

Chart 2. Percentage distribution of citizen interest in trainings on how to respond to disasters caused by wildfires.

The knowledge individuals possess is mainly acquired through education or experience. Of course, the task of the respondents was to assess their knowledge, so that we have their ideas, in other words, we cannot say with certainty that people who believe they possess the necessary knowledge, really possess that knowledge. In order to determine the actual level of the respondents' knowledge, it is necessary to conduct additional examinations and tests. 40.1% of the respondent answered "No" to the question "Are you interested in attending training for responding to disasters caused by forest fires in order to improve your preparedness?", 35.5% answered "Maybe", while 24.4% of the respondents answered "Yes" (Chart 1).

Only 24.4% of the respondents would be interested in attending wildfire response training courses. This result may be justified by the fact that people have insufficient awareness of the need to take appropriate protection measures and improve their own preparedness. If an appropriate image of the importance of training courses were created in the public, a larger number of people would likely show interest in them. In order to determine the number of those interested in training with certainty, it is necessary to specifically examine the respondents who may be interested. It is necessary to determine which factors affect their commitment, that is, in which situations they would be interested in attending training courses. 94.9% of the respondents answered "No" to the question "Do you have appropriate plans and appropriate equipment for responding to emergencies caused by forest fires?", while 5.1% answered "Yes". Only 5% of respondents have plans and equipment for disaster response. We would assume that those respondents who possess the appropriate knowledge of disaster response also possess the necessary equipment and plans. However, a small number of respondents who answered "Yes" to this question is worrying and may indicate that the level of citizen preparedness is much lower than they believe. In order to approach the analysis of the causes of this, it is necessary to determine whether the respondents know what is meant by wildfire response equipment. 29.9% of the respondents answered "Yes" to the question "Do you think you are in danger of forest fires?", while 70.1% answered "No".

Despite the fact that Prijepolje is a predominantly forested area and that wildfires are a relatively common occurrence, our results demonstrate that 70% of the respondents do not think wildfires pose a danger to them. This may suggest that people are careless about the environment and if they have not had any direct experience with wildfires, they do not believe they may find themselves in danger. Also, people probably have an unrealistic image of the dangers and consequences caused by wildfires. Few people are aware that it takes decades and huge sums of money to renew forest areas burned by fires. Even in cases of low-intensity wildfires, when trees are damaged, they must be cut down in order to prevent their gradual decay, disease and the spread of the disease. The following table shows the responses of the male and female respondents regarding their preparedness for disasters caused by wildfires. Only 10.57% of the female respondents believe that they have adequate knowledge

of disaster response, while as many as 35.13% of the male respondents believe so. Interestingly, a small number of the respondents of both sexes have plans and equipment for disaster response, only 2.44% of the females and 9.46% of the males.

Table 2. The result of cross tabulation of sex and disaster preparedness.

		Knowledge			Training			Response plan and equipment		Danger	
Sex		Yes	No	Not Sure	Yes	No	Maybe	Yes	No	Yes	No
Male	N	26	25	23	22	29	23	7	67	22	52
	%	35,1	33,7	31	29,7	39,1	31	9,46	90,5	29,7	70,2
Female	N	13	66	44	26	50	47	3	12 0	37	86
	%	10,5	53,6	35,7	21,1	40,6	38,2	2,44	97,5	30,0	69,9
Total	N	39	91	67	48	79	70	10	187	59	138
	%	19,8	46,1	34	24,3	40,1	35,5	5,07	94,9	29,9	70

Interestingly, as many as 60.87% of the respondents under the age of 30 believe that they do not have the appropriate knowledge to respon to disasters, 43.30% between the ages of 31 and 50, with 38.89% over the age of 51. the respondents over 51 are the least interested in attending training courses. As many as 57.40% of the respondents over 51 are not interested in training courses, including the respondents aged 31 to 50 (37.11%) and under 30 (26.07%). The respondents over 51, in a slightly higher percentage that the younger respondents, believe that they have the necessary knowledge to respond to wildfires. The reason for this may be the fact that they have probably already encountered forest fires during their lifetime, therefore they believe that they have improved their preparedness through experience. Also, this may indicate that people's self-confidence grows with age and they overcome any insecurity during their youth. The older respondents are the least interested in training courses, while the respondents under 30 show the greatest interest. They are more willing to learn and improve, while the older respondents are stiffer in their attitudes and find it harder to learn and remember. However, the respondents under 30, a significantly higher percentage than the older respondents, have wildfire response plan and equipment. The older respondents are likely to overestimate their knowledge and abilities, while the younger respondents are insecure about their knowledge.

The answers of the respondents of different marital status are presented below. Interestingly, about 60% of engaged respondents (3 respondents out of 5 respondents) express their interest in attending disaster response training courses, 40% of those in a relationship, 29.03% of those who are not in a relationship and 19.01% of those who are married. Also, 40% of engaged respondents (2 respondents), 40% of those who lost their partner (4 respondents), 38.71% of those who are not in a relationship, 28.10% of those who are married and 23.33% of those who are in a relationship believe that wildfires pose a dan-

ger to them. The largest percentage of their knowledge of wildfire response was positively assessed by widows/widowers, including engaged respondents. The most interested in the trainings are the loyal respondents, as well as the respondents who are in a relationship. The potential reason for these results probably lies in the fact that they are most often younger people who plan to live and have children together, so they want to take all measures so that they and their descendants can live in safe and secure conditions. The largest percentage of engaged respondents have plans and equipment for reacting in case of forest fires, which speaks in favor of the previous theory.

Regarding the impact of education, our survey has shown that those with higher education are the most confident in their knowledge of disaster response – 32.35% of them self-assessed their knowledge as being satisfactory. Also, 27.27% of those with primary education, 20% of those with higher education, and 14.95% of those with secondary education positively assessed their knowledge as being satisfactory. On the other hand, the least interested in attending additional training courses are those with primary education, only 9.09% are interested in training courses (1 respondent), followed by 20.56% of those with secondary education, 31.11% of those with university degrees and 32.35% of those with higher vocational education. The respondents with higher vocational education and university degrees believe that they are at risk of wildfires (35.29% and 33.33%) compared to the respondents with secondary and primary education (27.10% and 27.27%). People with primary and secondary education are most confident regarding their knowledge to respond in the cases of a wildfire, while the respondents with higher vocational education and university degrees are most interested in attending training courses. The respondents with primary education are the least interested. This can be explained by the excessive self-confidence of people with primary education and insufficiently developed awareness of the need to improve their own preparedness. In addition, the respondents with higher vocational education and university degrees, to a greater extent than those less educated, believe that wildfires pose a danger to them.

Our survey results demonstrated that about 31.82% of unemployed respondents believe that they have appropriate knowledge of disaster response, including the employed (17.65%) and retired (22.73%) respondents. The least interested in attending training courses are retired respondents, as many as 63.64% have a negative attitude toward training courses, including 50% of the respondents who are unemployed and 35.29% of those who are employed. A majority of respondents with a monthly salary not exceeding 25,000 dinars negatively assessed their knowledge of disaster response, as many as 58.44% of them believe they do not have adequate knowledge, including 44.09% of those with a salary ranging between 26,000 and 50,000, as well as 25% of those with a salary ranging between 51,000 and 75,000, and only 13.33% of those with a monthly salary exceeding 76,000. Those with a monthly salary exceeding 76,000 are the most interested in attending training courses – 46.67% of them

showed interest in it – 23.38% of those with a monthly salary not exceeding 25,000, 22.58% with a monthly salary ranging between 26,000 and 50,000 and only 16,67% of those with a monthly salary between 51,000 and 75,000. Interestingly, none of the respondents with a salary above 51,000 (including the group of respondents with a monthly salary exceeding 76,000) have disaster response plans or equipment, including 96.10% of those with a monthly salary less than 25,000 and 92.47% of those with a monthly salary between 26,000 and 50,000. Also, 60% of the respondents with a monthly salary above 76,000 believe they are at risk of wildfires, as well as those with a monthly salary ranging between 51,000 and 75,000 (41, 67%), those with a monthly salary not exceeding 25,000 (29.87%) and of those with a monthly salary ranging between 26,000 and 50,000 (23.66%). The respondents with a salary above 76,000 dinars assessed their knowledge negatively. Additionally, these respondents, to a much greater extent than other categories of respondents, showed interest in attending wildfire response training courses. We assume these people have a responsible and demanding job, which leaves them little room to do other things. Given their interest in training, they are obviously highly aware of wildfires and their consequences. None of them has a response plan or equipment for, and they, in a much higher percentage than the others, believe wildfires pose a danger to them. The largest percentage of respondents with a monthly salary ranging between 26,000 and 50,000 have a wildfire response plan and equipment, and most of them positively assessed their knowledge, so we can conclude that they are at a higher level of readiness compared to other categories of respondents.

The research indicated that those who are afraid of wildfires think they do not have adequate knowledge of how to respond to disasters, about 50% of the respondents answered negatively, including 39.29% of those who are not afraid of wildfires and 45.71 % of those who are not sure if they are afraid of them. Accordingly, the least interested in attending training courses are those who do not feel fear of forest fires, 60.71% of them answered negatively, as well as 35.85% of those who fear wildfires and 20% of those who are not sure whether they are afraid. None of the respondents who are not sure whether they fear wildfires have disaster response plans and equipment. 8.93% of the respondents who are not afraid of wildfires have disaster response plans and equipment, as well as 4.72% of the respondents who are afraid of wildfires. Only 14.29% of those who are not afraid of wildfires believe that wildfires pose a danger to them, including 37.74% of those who are afraid of wildfires and 31.43% of those who are not sure if they are afraid of them. The respondents who do not fear wildfires mainly think that they have satisfactory knowledge of disaster response. It may be concluded that these respondents are not afraid of wildfires because they believe in their knowledge. Of course, the respondents who are afraid of wildfires are most interested in attending trainings. Compared to other respondents, a significantly higher percentage of the respondents who are not afraid of wildfires have disaster response plans and equipment.

DISCUSSION

Our survey findings suggest that the male respondents, unlike female respondents, consider their disaster preparedness to be good. They are also more interested in attending training courses to improve their preparedness. Thus, according to the findings, we can conclude that there is a certain difference between men and women regarding response preparedness. Our findings are not in line with the findings of the survey conducted in Tehran in 2014, according to which, there is no difference in preparedness between male and female respondents (Najafi et al., 2015). On the other hand, the study conducted in Turkey demonstrates that women are more concerned about possible disasters and are more aware of the seriousness of their consequences (Karanci et al., 2005). The results of this study showed that marital status affects the readiness of the respondents, since the married respondents have a more pronounced perception of risks compared to the respondents who are single.

In relation to the established level of citizen preparedness to respond to disasters caused by wildfires, it may be said that the low level of citizen preparedness is the result of insufficient awareness of wildfires, their possible consequences and the need to improve knowledge to provide adequate disaster response. Given tha the respondents were asked to self-assess their knowledge of how to respond in case of wildfires, these assessments do not have to present the respondents' actual knowledge. We have to take into account the fact that there are different types of people, so some of the respondents potentially overestimated or underestimated their knowledge and abilities. A small number of respondents having disaster response plans and equipment is worrying may indicate that a much smaller number of respondents know how to respond to wildfires, compared to the number of those who believe in it. Additionally, the majority of respondents do not believe that wildfires pose any danger to them. This is most likely due to the belief "it will not happen to us", which is stronger than the fact that wildfires frequently occur in Prijepolje, especially during the summer months.

In regard to the impact of education, people with college degrees do not believe they have the necessary knowledge to respond to disasters, although they believe they are at risk of wildfires. Our survey findings are not in line with the results of the research conducted in Thailand and the Philippines, which examined the impact of education on the preparedness of the population, with their demographic characteristics being controlled. The results showed that formal education increases the propensity for disaster preparedness activities, that is, education improves abstract thinking and anticipation skills, therefore people with college degrees take preventive measures without having to experience a harmful event and learn later (Hoffmann & Muttarak, 2017). We can assume that the inconsistent results are a consequence of a different socio-economic system in which people live, as well as insufficiently developed awareness among our people about the importance of undertaking preventive activities.

Interestingly, compared to the employed and retired respondents, the unemployed respondents believe they have satisfactory knowledge of how to respond to wildfires. The results obtained are not consistent with the research results where it was determined that employees to a greater extent took certain preventive measures in order to reduce the material consequences of floods (Perić & Cvetković, 2019; Rico, 2019).

The results indicate that the respondents who are afraid of wildfires are more interested in attending training courses to improve their response preparedness, given that they under assessed their knowledge to respond to wildfires. We may conclude that the results are somewhat consistent with a survey conducted in the United States, which aimed to determine the impact of risk perception on citizen preparedness. The results of this research indicated that risk perception does not have a significant direct impact on citizen preparedness and the impact of perception is largely conditioned by knowledge to respond, the perception of effectiveness of preventive activities and previous experience (Bourque et al., 2013). Our research confirms the influence of risk perception, but we must take into account that this influence is conditioned by both demographic and socio - economic characteristics of the respondents. Our results indicate that the respondents over the age of 51 have more self-confidence regarding their knowledge of disaster response. Our results are consistent with the results of the study conducted in the United States, where the respondents over the age of 55 showed a high level of preparedness, unlike the respondents aged 18 to 34 (Ablah, Konda & Kelley, 2009).

CONCLUSION

Our findings indicate that people are insufficiently prepared to respond to wildfires. Also, the need to develop awareness among citizens about the importance of preparedness and preventive measures in relation to such disasters is clearly emphasized. A much higher percentage of people believe they have some knowledge of how to respond to disasters, compared to the percentage of people who have the equipment and response plans, which may suggest that the level of citizen preparedness is much lower than they believe. The limitation of this research is reflected in the number of respondents, the results would be more reliable if a larger number of people were included in the research. The results indicated that men were more prepared than women, that is, older respondents than younger respondents. The impact of education and salary level on citizen preparedness has not been confirmed, and the unemployed respondents, unlike the employed ones, self-assessed their preparedness as good.

In addition to the mentioned characteristics, our research confirms the impact of previous experience and risk perception on the readiness of citizens to respond to wildfires. Obviously, our people are insufficiently aware of the risk of wildfires and preventive measures in relation to disasters. It is necessary

to continue the periodic examination of citizen preparedness, as well as to take certain measures for improvement. This would include organizing periodical training courses, seminars, conferences, and the like.

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