



Road users' attitudes and perception on selected road safety issues – age-related comparison

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Abstract

Traffic safety is a challenge and a very serious problem on a global level due to the high number of traffic fatalities and injuries. In the driving context, road users' personality characteristics, attitudes and behaviour may influence how individuals, especially young people, respond to certain driving situation. Young drivers are among the most vulnerable road users, particularly during the first few months of independent driving. While they represent only a small percentage of licensed drivers, they are more likely to be involved in fatal and injury crashes than older ones. The main aim of this paper is to explore differences of attitudes between young adults and others. The results are presented in regard to road users' age (under 24 years old and older), with both, gender and driving experience as control variables. The study showed that the perception of the overall safety situation differs related to different age group.

Keywords: Road safety perception; questionnaire survey; young drivers; road safety risk factors; road safety measures.

1. Introduction

Although ITF reported reduction of 25% in number of young people killed in road traffic accidents over past ten years (ITF/OECD, 2021), they remain the leading cause of death among young adults and the over-representation of young and novice drivers in road crashes remains one of the global road safety issues. In 2017, almost 14% of people killed on EU roads were aged between 18 and 24, although only 8% of the population fell within this age group (EC, 2018). Similar situation is in Montenegro, where 10% of the population represent people aged 18–24 who are involved in 19% of all traffic accidents in the first eleven months of 2020 (Fig. 1).

Young adults are recognized as specific road user group with different attitudes and perception towards road safety problems and risk factors. This group is more at risk than other road users, with variety of factors that contribute to accidents, namely inexperience, immaturity, careless driving habits (Davis, 2004) and risk taking behaviour (Rolison et al. 2014). The main cause of high crash rate of young drivers is lack of experience. Curry et

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al. (2015) reported higher crash risk among younger than for older novice drivers, and also lower crash rates of those with more driving experience.

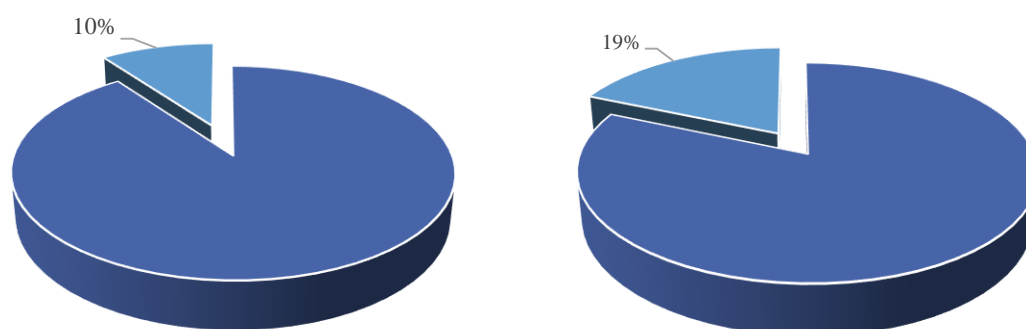


Figure 1: Youngsters in population (left) and in road accidents (right) in Montenegro. Source: Montenegrin Ministry of interior.

It should be noted that there are different definitions of young drivers in the literature. Some authors have defined them according to age, and others according to experience. Length of holding the driver license has been found to be a better indicator in studies attempting to quantify the relative importance of age and experience factors (McCartt et al., 2009). Some studies include all drivers aged 16 to 24 years (Deery, 1999) while others restrict the range to 16 to 19 years (Williams, 2003), 17 to 20 (Curry et al., 2015), 15 to 29 (Payani et al., 2019), 18 to 29 (Da Silva et al., 2018) or 18 to 24 years (Kalašová et al., 2020). The variation in definition is due to the difference between countries in the legal age that a driver may first obtain a driving license, as well as to the way they obtain it.

Numerous studies have found that certain risky driving behaviours are more common in younger drivers than in older ones, and also that the occurrence of an accident is usually influenced not by one, but by a combination of several factors. Different types of factors have been examined and it has been recognized that they are more prevalent among younger drivers. For example, driving at night has been shown to be especially risky for novice drivers (Mathijssen and Houwing, 2005); Russell et al., (2011) show that crash rates for young drivers decreased (between 26-41%) during the first year of unsupervised driving; also, young drivers overestimate their driving skills (De Craen et al., 2011) and young male drivers are more likely to be involved in fatal road crashes than young female drivers (Jones, 2017). Above 50% of young driver crashes happened due to speeding (Gonzales et al., 2005) that is rather reactive behaviour than planned (Forward, 2020).

Young drivers drive more safely with an adult or a child in the car than with a friend of the same age (Engström, 2008). Further, fatality risk increases when younger drivers consume alcohol (Scott-Parker et al., 2014), and young people who use psychotropic substances have tendency to drive while under the influence (Da Silva et al., 2018). One of more important factor nowadays, influencing in distracting (especially younger) drivers in large amount, is using mobile (smart) phone while driving. Bucsuházy et al. (2020) found that there is a greater risk of mobile phone use while driving among drivers for up to 24 years old than others. Turner and McClure (2003) shows that when using smartphone for Facebook or to write/read messages, between 40% and 60% of their time drivers are spending looking away from the road, compared with about 10% of the time looking down normally. Rolison and Moutari (2020) found that co-occurrences of driving above the speed limit, bad road conditions and inexperience of young drivers, raise their risk of causing an accident.

Also, many extensive studies, such as RSAR (Road Safety Analytical Report), SARTRE (Social Attitudes to Road Traffic Risk in Europe) and ESRA (E-Survey of Road Users' Attitudes), have analysed road users' culture, behaviour and attitudes to address different road safety topics and to cover attitudes and opinions on unsafe traffic behaviour from several types of road users. Understanding how individual drivers rate the driving within their country, providing support for road safety policies and making database on the state of road safety comparable between countries, were the main goal of these studies. As non-EU country, Montenegro has not been included in those surveys, although there is some number of study about road safety perception in Montenegro that has been previously obtained (Pajković and Grdinić, 2014; Grdinić and Pajković, 2016). However, no research has been conducted on differences in drivers' perceptions by different age, gender or driving experience, so the main goal of this paper is to examine the attitudes of drivers on Montenegrin roads depending on their age, with an emphasis on young adults. Among young adults, attitudes towards gender and experience were considered, and compared with correspondent groups among the elderly.

2. Methodology

2.1 Survey design and sampling procedure.

For the purpose of collecting data on attitudes on the state of road safety in Montenegro, opinions on enforcement and support for policy measures, a survey was conducted by Dept. of Road Traffic in Faculty of Mechanical Engineering at University of Montenegro based on a RSAR questionnaire derived by Gallup Organization (2010). The first survey approach was face-to-face questionnaires and these forms were handed out randomly in several locations such as apartment's complexes, supermarkets, and train and bus stations. Additionally, an online survey named Road Safety Perception in Montenegro was constructed and implemented using Google Drive software and its URL was sent to students at University of Montenegro and was posted on Facebook asking young drivers who live in Montenegro to participate. As with most attitudinal surveys, it is inevitable that within the survey responses some answers have been given which may reflect the individuals' beliefs but which factually are suspect.

The target population of this survey was "younger" compared to "older" road users. Sampling control variables were: sex (male, female) and driving experience. "Age" was previously divided into six age groups: less than 18 years; 18–24 years; 25–34 years; 35–44 years; 45–54 years; and 55 plus years, and then reduced to two main groups: below and above 24 years of age; "driving experience" was divided into four groups: persons without driving license, drivers holding driving license less than 2 years, drivers holding driving license 2–5 years and drivers holding driving license more than 5 years. A measure of traffic exposure was obtained by asking study members how many times they usually drove, and the response options were: almost every day, 1–3 times per week, 1–3 times per month and less than once per month/don't drive. Based on the exposure, respondents were classified into two groups: those with high exposure (answers: almost every day and 1–3 times per week) and those with lower exposure.

In order to measure attitudes related to traffic safety, respondents evaluated state of road safety in Montenegro as safe, fairly safe, fairly unsafe and unsafe. The participants had to rank each of road safety influencing factors on 5-point scale of Likert type, where 1 stood for significant influence and 5 stood for insignificant influence. Same scale was used for ranking road safety improvements that should be done according to study members.

Originally, survey consisted of 8 questions and number of respondents was 167. Afterwards, an additional question about measures for young drivers was added and by adding this question where respondents also had to rank measures on a scale of 1 to 5, the final sample size was 327 respondents.

2.2 Participants.

After some initial drop-out, the total sample consisted of 327 respondents with approx. 75% males and approx. 25% females (Figure 2). About half of respondents (51.99%) were below 24 years old (among them, 78.24% males and 21.76% females). Mean age of the respondents was $M = 26.54$ years ($SD = 6.75$ years). The over-representation of male respondents in the sample is a reflection of the general male dominance in the driver population of Montenegro. The majority of the participants (85.63%) were drivers. Of those, 18.57% had driving license less than 2 years, 35.36% had been licensed between 2 and 5 years, and 46.07% had been licensed for more than 5 years. Over a half of the participants, both below age of 24 and total sample, reported driving daily (about 55%).

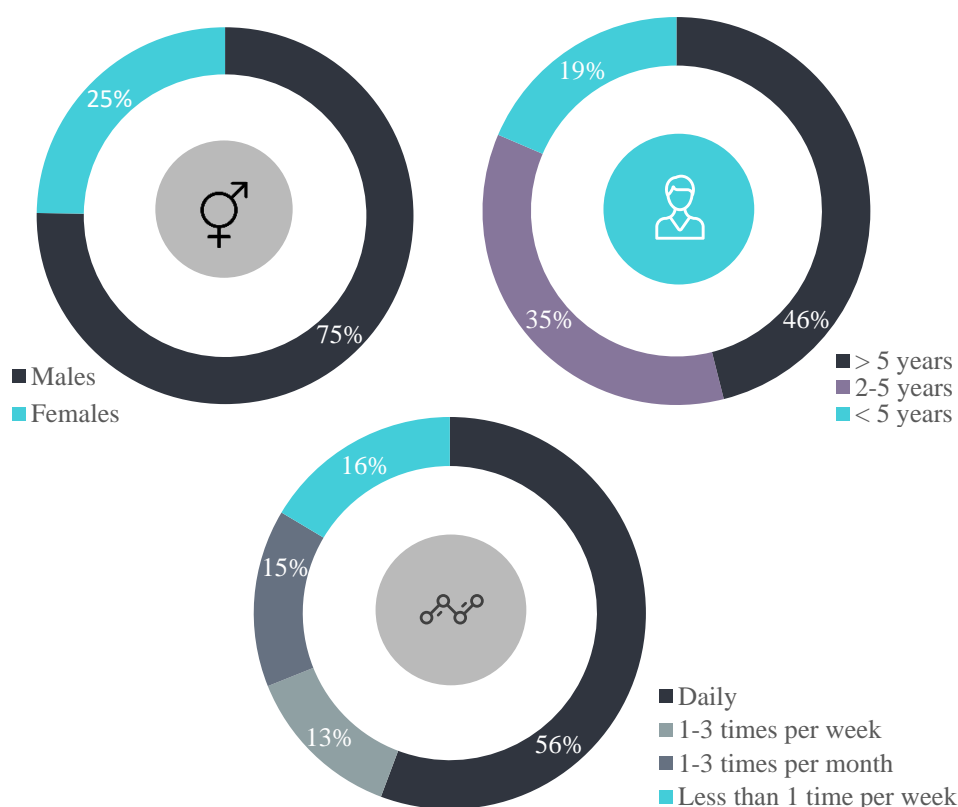


Figure 2: Descriptive statistics.

3. Response analysis – results and discussion

In traffic safety, generally, great effort is putting to portray a psychological understanding of driver behaviour and perceived risk. Opinions, beliefs and behavioural intentions of different groups of users regarding matters of road safety are a source of relevant information, since they reveal characteristics of their attitudes in relation to mobility and safety, their relations with other users, their experiences and their concerns. In Montenegro, an earlier study was conducted during 2014–2015 (Pajković and Grdinić,

2014; Grdinić and Pajković, 2016) in order to address the issue of drivers and non-drivers' road safety perceptions. Both of these studies were updated with the following study, which expands the classification of respondents related on age, and also uses gender and driving experience (combined driving license period and driving frequency) as control variables. The results are shown below.

Overall perception on road safety in Montenegro is presented in Figure 3. It can be seen that majority of younger respondents (39%) perceive safety situation as fairly safe, and at the same time, majority of respondents older than 24 years, perceive safety situation as fairly unsafe (35%). Statistically, however, there is no significant difference (with the significance level 0.05) when variable "age" in matter. "Gender" was also found to have no impact in perception of overall safety situation and only variable that seems significant is the driving experience, where more experienced drivers, both among young people and elderly, perceive safety on Montenegrin roads as less favourable ($p = 3.59 \cdot 10^{-5}$, $\chi^2 = 30.20$ for total sample, $p = 0.007$, $\chi^2 = 12.15$ for participants under 24 years of age).

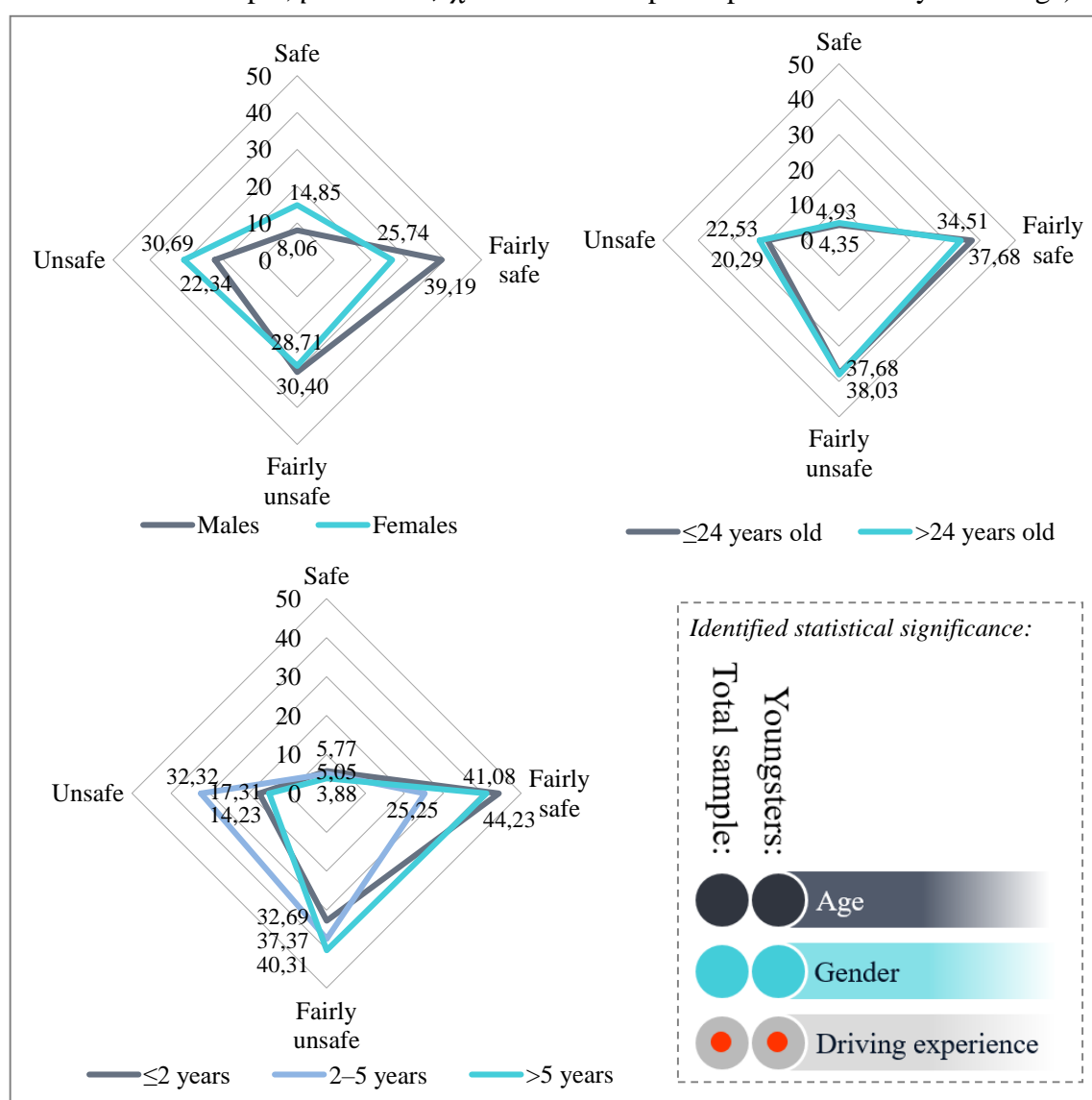


Figure 3: Overall perception on road safety.

Table 1 records the overall mean scores related on road users' perception about specific road safety problems (traffic risk factors). A lower mean reveals riskier driving behavior based on road users' opinion. Examination of the mean scores indicates that among the five driving factors, driving under the influence of alcohol was considered the most important issue of drivers' risk behavior, based on opinion of majority of respondents. The results of the sample analysis (Figure 4) show that the "driving experience" has significant effect ($p = 0.022$) on the individuals' perception about the severity of this risk factor, while among youngsters there is a significant difference in perception by "gender" ($p = 0.035$). Speeding was regarded as the second most important risk factor, the results of which showed that neither "age", "gender" or "driving experience" had statistically significantly effect on perception ($p > 0.05$).

Table 1: Perception about road safety risk factors.

Statement: To what extent these problems influence road safety	Total Sample							Young [<24 years old]				Total	
	Age [years]		Gender [male/female]		Driving experience [years]			Gender [male/female]		Driving experience [years]		Mean (SD)	R
	≤24	>24	M	F	≤2	2-5	>5	M	F	≤2	>2		
People driving under the influence of alcohol	2.20	2.04	2.17	2.00	2.50	2.23	1.91	2.29	1.86	2.50	2.14	2.17 (0.21)	1
Drivers exceeding the speed limits	2.55	2.61	2.59	2.53	2.35	2.68	2.56	2.52	2.65	2.43	2.51	2.54 (0.09)	2
Non-respecting traffic regulations	2.76	2.99	2.81	3.07	2.73	2.84	2.91	2.71	2.95	2.67	2.78	2.84 (0.13)	3
Driving while using mobile phone	3.25	3.27	3.26	3.26	3.52	2.92	3.48	3.25	3.24	3.50	3.07	3.27 (0.18)	4
Insufficient driving ability of young drivers	3.30	3.33	3.24	3.45	3.53	3.56	3.04	3.25	3.42	3.53	3.05	3.34 (0.18)	5

Likert scale scores: 1= to a very large extent; 5= to a very small extent

*All data in columns (except rank R) are means

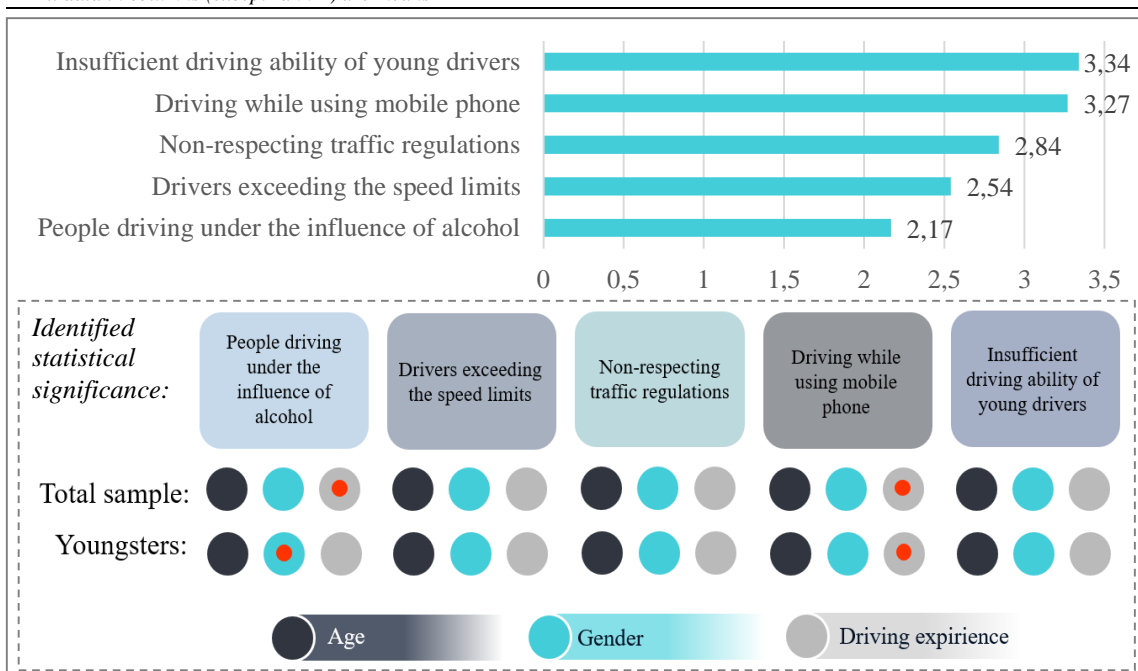


Figure 4: Perception about road safety risk factors (total sample).

These two most important risk factors are followed by non-respecting regulations, driving while using a mobile phone, and insufficient driving ability of young drivers, by order, whereby small significant differences are noticeable only in drivers who has a different driving experience (e.g. $p=0.018$ and $p=0.039$, for using a mobile phone while driving for both, all respondents and those under 24 years of age, respectively). Generally, more pronounced and clearer attitudes about problematic driving behaviors have older and experienced road users in contrast to others.

All respondents were also asked about actions that national authorities should take to improve road safety, and answers were recorded in Table 2. A slim majority of Montenegro citizens said that road infrastructure safety should be improved as a first priority, giving it a score $M = 2.24$ ($SD = 0.21$).

Table 2: Perception about specific road safety measures.

Statement: To what extent these problems influence road safety	Total Sample							Young [<24 years old]				Total	
	Age [years]		Gender [male/female]		Driving experience [years]			Gender [male/female]		Driving experience [years]			
	≤ 24	> 24	M	F	≤ 2	2–5	> 5	M	F	≤ 2	> 2		
												Mean (SD)	R
Improve road infrastructure safety	2.50	1.87	2.21	2.16	2.19	2.44	1.98	2.53	2.41	2.18	2.22	2.24 (0.21)	1
Improve pre-licensing	2.92	3.25	3.17	2.81	3.06	3.06	3.16	2.98	2.68	2.75	2.42	2.92 (0.25)	2
Increase traffic monitoring	3.05	2.90	2.97	3.00	2.94	2.94	3.01	2.98	3.30	2.64	2.53	2.93 (0.20)	3
Strict penalties	2.98	3.43	3.20	3.17	3.13	3.13	3.40	2.93	3.14	2.80	2.69	3.09 (0.23)	4
Initiate more road safety awareness campaigns	3.56	3.54	3.46	3.83	3.42	3.42	3.47	3.59	3.49	3.23	2.85	3.48 (0.27)	5
Likert scale scores: 1= to a very large extent; 5= to a very small extent													
*All data in columns (except rank R) are means													

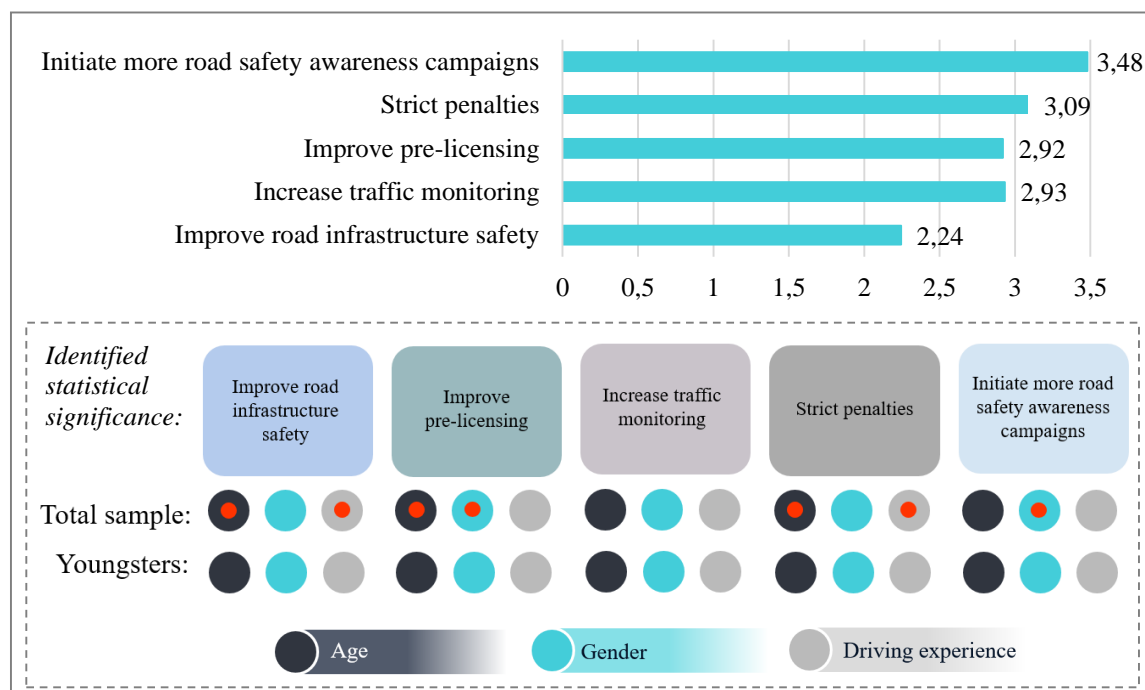


Figure 5: Perception about road safety national authorities' actions (total sample).

Meaningful difference (as can be seen in Figure 5) is recorded related to variable “age” (older respondents were stricter regarding the measure of improvement of road quality with the mean score $M = 1.87$, than younger ones who rated it with a mean score $M = 2.50$, $p = 4.30 \cdot 10^{-5}$) and also to “driving experience” (with the mean score $M = 1.98$ and $M = 2.19$ according to drivers with more and less experience, respectively, $p = 0.015$). Improvement of pre-licensing was the second most frequently selected measure, followed by increasing the traffic monitoring.

Small statistically significant difference of opinion on pre-licensing was related to “gender” ($p = 0.041$) with women more emphasizing it ($M = 2.81$) than men ($M = 3.17$), and also related to “age” ($p = 0.024$) with, interestingly, larger support from younger ($M = 2.92$) than from older respondents ($M = 3.25$). Stricter penalties system for non-respecting traffic regulations and more road safety awareness campaigns are the last, but not the least, measures that the government should concentrate on in order to enhance road safety based on road users’ opinion (Fig. 5). Albeit some authors have concluded that the majority of campaigns conducted to influence road users’ risk perception were not successful in decreasing the total number of traffic accidents (Ulleberg and Rundmo, 2003).

Since young people represent one of the most vulnerable groups in road traffic, special attention was devoted to improve their safety. Respondents’ incentives on making changes related to young drivers under the current model of road safety were identified by question “What should be changed in order to increase road safety of young drivers (police checks/fines/publicity and advertising)?” This question was focused on changes in the system of police checks and regulations, and measured general opinion about countermeasures. Answers are presented in Figure 6.

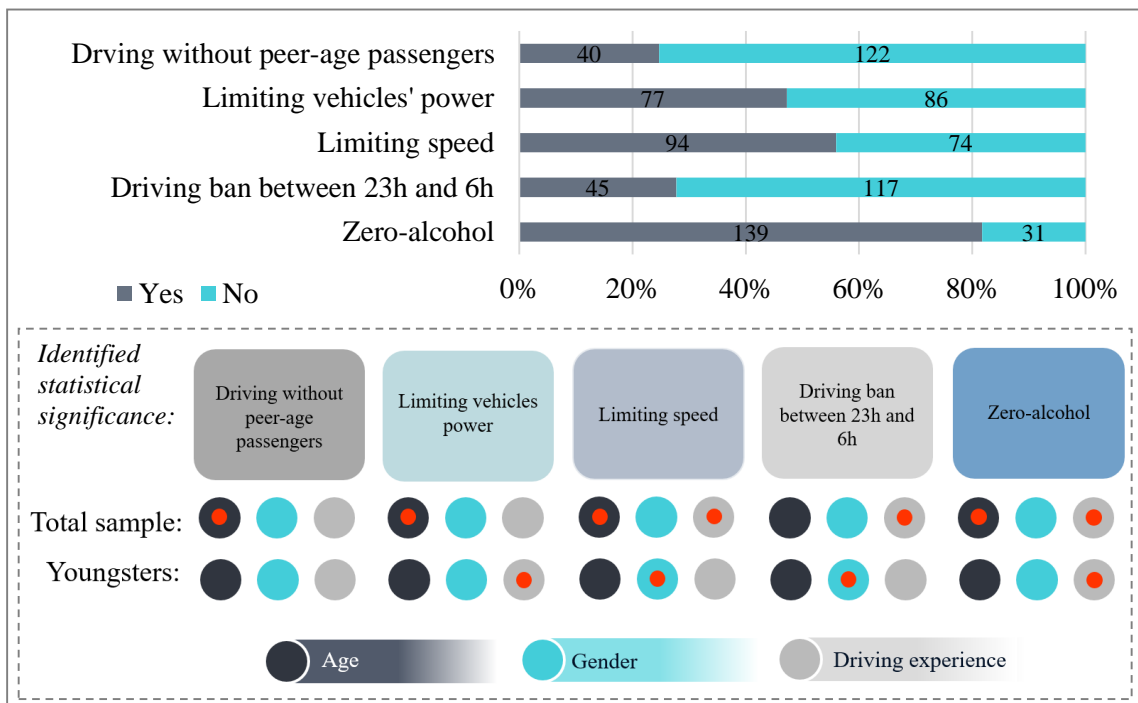


Figure 6: Perception about road safety measures for young drivers (total sample).

The greatest support has zero-alcohol initiative. This is not surprise since driving under the influence of alcohol was abstracted as the most problematic issue of road safety in

Montenegro. This initiative was supported by 75.63% respondents under the age of 24 years and even 95.12% of older with high significance difference ($p = 0.006$, $\chi^2 = 7.42$) between them. Variable “driving experience” is also significantly related to following measure for young drivers ($p = 0.005$, $\chi^2 = 10.41$) where more experienced drivers approve zero-alcohol initiative to a greater extent than those less experienced (91.53% vs. 70.00%). Similar situation is among participants under 24 years old: 83.33% of young drivers who have a license for more than two years were in favor of banning young people from driving under the influence of alcohol, in contrast to 66.67% those with less driving experience.

Limiting speed and power of the vehicle for young drivers also received considerable support. In the overall sample, 53.75% of respondents were for limiting speed and 46.25% for limiting power of young drivers' vehicle. Those up to 24 years of age approx. equate the importance of these measures (about 50%), with significantly larger support ($p = 0.013$, $\chi^2 = 6.21$) from women (75%) than man (44.44%) when limiting speed in matter.

However, both rules, driving without peer-age passengers and driving restriction in the night-time period, did not meet with approval of the youth where only 17.65% of youngsters considered a peer-ban to be expedient (in contrast to 41.46% of older) and only 15.13% of them (vs. 60.98% of older) have the same opinion for ban on night drive.

When analysing responses only from young drivers, the conclusion is made that the problem posed by young people driving at night is more recognized by women (30%) than men (12.12%); driving experience in that sense has no influence (significance of the difference by gender was $p = 0.041$, $\chi^2 = 4.14$; by driving experience $p > 0.05$), as it can be seen in Fig. 5. Moreover, more experienced young drivers were somewhat less aware of severity of the problem of driving young people in the company of peers than those with less driving experience (15.15% vs. 20.75%).

Given the association between passengers and accidents which is related to young drivers, banning passenger for drivers when they first begin driving unsupervised is an option that should be merits serious consideration in Montenegro. Situation on these questions is slightly different when the elderly is also taken into account. In that case, all initiatives received considerable support, concluding that older road users are more aware of tendency for risky behaviour of younger driver.

4. Conclusion

Specific objectives of this particular study were to observe perceptions of different group of road users about the seriousness of road safety problems, to identify community attitudes to major road safety issues, to determine road safety problems to which national authorities should pay more attention, and also to identify measures that the national government should focus on to improve road safety. The data used for the analyses were obtained from an anonymous questionnaire survey carried out in Montenegro. The questionnaire consisted of demographic data on participants, their attitudes and traffic risk perception. The demographic part of the questionnaire included driver's age, gender and driving experience (i.e. the period of holding the driver's license and the driving frequency). The final sample included 327 respondents. Individuals were further stratified on the basis of age group (less or more than 24 years old), with both, gender and driving experience as control variables. Separate issues were related to risk-taking attitudes, in-vehicle distractions and aberrant driving behavior among young drivers.

The analysis presented in this paper has provided some evidence that the individual attitudes of young and older drivers differs from each other. However, the magnitude of

these differences was not strong. For example, older respondents assess the general state of road safety more unfavorable than younger ones, but the difference in their attitudes is not statistically significant; or, driving under the influence of alcohol was recorded as being the most important risk factor of drivers' behavior except among unexperienced young drivers who hold their driving license under 2 years. This group of drivers perceived driving above the speed limit as the riskiest behavior. Opinion of the same group of drivers differs related to other question raised as well. While the rest of respondents thought that the road infrastructure safety needs to be improved as a first priority by Montenegro government, drivers with driving license less than 2 years had an opinion that priority should be given to increasing of traffic monitoring. Moreover, "driving experience" proved to be the most influential variable in these analyzes, more influential in terms of drivers' perceptions and attitudes than "age" and "gender".

Respondents' age also influences their perception of the safety measures to be implemented in road safety strategies for young drivers. All of the proposed measures received less support from road users younger than 24 years old, especially night-time driving and driving without peer-age passengers. These results indicate that road users above the age of 24 were more aware of risky behaviors undertaken by young people on roads in Montenegro.

In general, the attitudes and opinions of young adults in Montenegro on traffic safety issues do not deviate significantly from the perception of their peers from other East European, neighboring countries. The research should be expanded to take into account some other risk factors, such as not wearing seat belts (included here under the general notion of non-compliance with traffic regulations), as well as further elaboration of safety measures that should be taken to increase road safety.

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