

Article

Youth Perceptions and Attitudes towards Road Safety in Serbia

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Abstract: Road traffic crashes are a leading cause of death for young people. Aberrant driver behaviors, such as drink driving, speeding, not wearing seatbelts, non-compliance with traffic rules and aggressive driving, are key contributors to these crashes. Gender and urban/rural differences are also risk factors. In Serbia, where this study was conducted, as well as in most European countries, younger people have the highest road crash and fatality risk. Thus, it is important to understand not only when these behaviors occur, but also the attitudes surrounding them. The latter will provide an avenue for intervention. To address this, a mixed design study was conducted, using a quantitative survey, focus groups and in-depth interviews to understand the attitudes and safety behaviors of young people (aged 16–25) in Serbia. Results across all methods showed that attitudes and perceptions regarding road safety differ across gender and location (urban/rural). Young drivers reported frequent engagement in alcohol-impaired driving, speeding, non-using seatbelts and using mobile phones while driving. Dominant attitudes underlying these behaviors related to lower perceived risk and a lack of perceived enforcements. These results show support for education campaigns in improving the risky behavior of young drivers.



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Keywords: youth; road safety behavior; attitudes and perceptions; gender differences; urban/rural differences

1. Introduction

Road traffic crashes are one of the three leading causes of death worldwide and the number one cause of death for people aged 15–29 years [1–5]. Contributing factors such as drink driving, speeding, non-using seatbelts, non-compliance with traffic rules, and aggressive driving are also recognized as the most common young driver behaviors associated with crashes and serious injury crashes [1–5]. The prevalence of these differs across gender, making gender a consideration in understanding this growing problem about youth road safety.

In Serbia, road safety is a major concern given its growing social and economic burden for the country. The Serbian Government recognized and adopted a new Road Traffic Safety Law in 2009. Since this time, road safety performance index reports show that Serbia has had a 54.6% reduction in road accident deaths in 2017 compared to 2001 [6], and compared to 2021, the reduction was 59.1% [7]. Further, 492 people died in road accidents in 2020, and in 2021, 521 people died in road accidents. When the number of people who died in traffic accidents in Serbia is viewed through public risk, the results indicate 7.2 fatalities/100,000 residents for 2020 and 7.6 fatalities/100,000 residents for 2021.

This risk is considerably higher when considering younger drivers. For example, in Serbia, youths have the highest road fatality risk. In 2021, those aged 15–30 years old represented 19% of total road fatalities. More than 52% of those young people died as drivers, and 83% were males. On average, these drivers had held a full license for six years, demonstrating inexperience as a potential factor. The most common type of accident is the

car running off-road, and almost half (49%) of these fatalities can be contributed to excess vehicle speed [7]. Understanding how to mitigate the risk associated with inexperience is key to reducing road fatalities and associated burdens.

Insights into driver perceptions and attitudes can help with this. Many researchers have explored this with research methods including qualitative and quantitative techniques. For example, Day et al. [8] interviewed drivers aged 17–19 years old to investigate high-risk factors for new drivers. They adopted a dual deductive and inductive interpretative thematic approach, identifying three super-ordinate themes: (1) improvements in car control skills and situation awareness; (2) a reduction in the thrill of taking risks when driving against a background of generally increasing driving speed; (3) early concerns about their social status in the eyes of other road users during the early stages of driving, which may put pressure on them to drive faster than they felt comfortable with. Developments in skill, thrill-seeking and feelings of driving status were reported. Ramos et al. [9] investigated perceptions about the evolution, magnitude, causes and determinants of traffic crashes in young people in Spain. They also explored the opinions on road safety regulations. This study was conducted among 12 focus groups, involving 98 participants. Ramos et al. [8] found that young people are aware that traffic injuries are a serious problem and contribute these to driving under the influence of drugs and alcohol, fatigue, night driving, unsafe infrastructures, age of drivers and lack of public transport alternatives.

In addition to research methods, Vlahogianni et al. [10] undertook a literature review of powered two-wheelers (PTW) accident risk factors and summarized that more than half of the published research reported questionnaire-based studies (i.e., quantitative methods), and most of them found that age, gender and exposure are the main risk factors. Kleisen [11] did research with the scope to determine perception of driving and driver training among young people aged 18–25 years old in Australia by using group interview as a method. They showed that young drivers know what safe driving means, but they lack a positive motivation to use a safe driving style. On the other hand, their negative motivation often does not deter them from using unsafe driving styles. Furthermore, Twisk et al. [12] evaluated five road safety education programmes for young adolescents by administering questionnaires before and again after participants attended these programmes. They found the proportions of participants that changed their behavior compared to the reference group (who did not participate in a programme) was small for all programmes. This was explored further using qualitative interviews to understand perceptions of young people that may influence programme outcomes. The key finding was that cognitive programmes were found to be as effective as fear-evoking programmes.

Similarly, Tetali et al. [13] used a qualitative analysis to understand Stakeholders' opinion for road safety perception in India. They found that factors such as inadequate traffic laws, gaps in enforcement, lack of awareness, lack of political will, poor road engineering and high-risk road users were identified as threats to road safety. Regarding determining a correlation between smoking, belt usage and road accidents, Koushki and Bustan [14] conducted a questionnaire survey of 1467 randomly selected young drivers in Kuwait. This study found that female young drivers are generally safer drivers than males. By using a questionnaire survey of 640 participants aged 17–18 years old, Rosenbloom et al. [15] performed research about the effectiveness of road safety workshops for young drivers in Tel Aviv. Authors found that road safety workshops are effective among young people who hold a driver license, on the contrary to those who do not hold a driver license.

Table 1 summarizes the most important characteristics of the key papers, such as the research methodology, location, sample, aim and the key research results on the topic of interest.

Table 1. Key characteristics and research results based on a literature review.

Authors	Research Methodology	Location	Sample	Aim of Research	Key Research Results
Gill et al. (2013) [16]	Face-to-face interviews	North Dakota (USA)	28 interviews with parents of teens aged 13–16 years	Parents' views of teen driving risks and graduated driver licensing.	Few parents expressed concerns over nighttime driving. Many expressed concerns over distracted driving. Most parents supported a nighttime driving restriction with exemptions, but less supported passenger restrictions.
Day et al. (2018) [8]	Interviews	United Kingdom	30 young drivers (aged 17–19 years)	The interviews probed high-risk factors for new drivers, as well as allowing space for generating novel road safety issues.	Developments in skill, thrill-seeking and feelings of driving status were reported.
Ramos et al. (2008) [9]	Focus groups	Barcelona (Spain)	98 young drivers	Young people's perceptions about the evolution, magnitude, causes and determinants of traffic crashes.	The main identified road safety contributory factors are: driving under the influence of drugs and alcohol, fatigue, night driving, unsafe infrastructures, age of drivers and lack of public transport alternatives.
Vlahogianni et al. (2012) [10]	Literature review	-	-	Literature review of accident risk factors.	More than half of the literature on accident risk factors were done by using questionnaires, and most of them found that age, gender and exposure are the main risk factors.
Kleisen (2013) [11]	Group interview	Australia	Young drivers (18–25 years of age)	The aim was to determine perception of driving and driver training among young people.	Young drivers know what safe driving means, but they lack a positive motivation to actually use a safe driving style. Their negative motivation often does not deter them from using unsafe driving styles.
Twisk et al. (2014) [12]	Questionnaire before and after programmes applied	-	1,874 young drivers and pedestrians (12–25 years of age)	Evaluation of five road safety education programmes for young adolescents by using questionnaires before and after programmes applied.	This study showed that the proportions of participants that changed their behavior compared to the reference group were small for all programmes.
Tetali et al. (2013) [13]	In-depth interviews	India	Government officials, subject experts and road traffic injury victims.	Perceptions of stakeholders on road safety were explored as part of the monitoring and evaluation process for better understanding of areas for improving road safety in India.	Actors such as inadequate traffic laws, gaps in enforcement, lack of awareness, lack of political will, poor road engineering, and high-risk road users were identified as threats to road safety.
Koushki and Bustan (2006) [14]	Questionnaire survey	Kuwait	1467 young drivers	Determining correlation between smoking, belt usage and road accidents.	This study found that female young drivers are generally safer drivers than males.
Smailović et al. (2019) [17]	Questionnaire survey	Serbia	60,666 drivers	This study examined the risk factors of driving under the influence of alcohol.	The non-use of restraint systems, driver experience, and driver age are the factors with a significant prediction of involvement in an accident and an insignificant prediction of driving under the influence of alcohol.
Rosenbloom et al. (2009) [15]	Questionnaire survey	Tel Aviv (Israel)	640 young drivers (17–18 years of age)	The aim of the paper was to research about the effectiveness of road safety workshops for young drivers.	Authors found that road safety workshops are effective among those young people who hold a driver license, on the contrary to those who do not hold a driver license.

Contrary to the positive effects of traffic safety programs reported elsewhere, these types of programs have only shown short term effectiveness in Serbia. The Road Traffic Safety Agency–Republic of Serbia conducted several youth road safety programs in the past few years [7]. These included: campaigns for young drivers translated to “Youth, not craziness” and “Mind on the road”; and enrolling more than 2000 high school students in driving simulations involving seat-belt use. These showed initial success, with 92% of participants intending to use seatbelts in the future. Despite the success of these programs, there remains limited understanding of the behavioral mechanisms underpinning aberrant behaviors of young people in Serbia. By understanding attitudes and perceptions, Serbia can continue to develop new and innovative interventions, as well as review and revise existing strategies designed to challenge key salient beliefs regarding unsafe driving behavior. This study aims to gain a better understanding of young people’s perceptions and attitudes towards safety behaviors, including questions of drunk driving, speeding, failure to use a seatbelt, respect for road laws and traffic rules, and aggressive driving.

This study uses a multi-method approach including questionnaires, focus group discussions and in-depth interviews to address the aims. In addition, perspectives from drivers and a range of stakeholders were sought. The scope of the data collection methods was to capture characteristics of the population that may be missed if using only one form of data capture. This study was particularly interested in identifying gender-sensitive differences in attitudes and perceptions of youth of road safety behavior, and between youth from urban and rural populations. The key research questions include:

- Q1. How do attitudes and perceptions regarding road safety differ among young people?
- Q2. What are the dominant trends in road safety behavior among young people?
- Q3. How does road safety behavior differ between rural and urban young people?
- Q4. What is the dominant understanding of road safety rules among young people?
- Q5. Where do young people learn about road safety?

The answers to these questions will help to understand the behavior of young traffic participants in the territory of the Republic of Serbia, which would create a basis for improving the traffic safety of this most vulnerable population. In addition, the results obtained using multiple methods will be presented, which will be the input for the creation of future campaigns and endeavors to improve the safety of young people in traffic.

2. Findings from the Literature Review

Most of reviewed studies reported that road accidents are the main cause of youth fatalities [1–4,18]. According to these documents, young adults are riskier in road accidents, and fatality rates for this age group are higher in low-income and middle-income countries.

The most represented factors which cause low youth road safety levels are connected with lifestyle, inexperience and the non-use of protective systems. The highest risk issues for this type of young people unsafety include: mobility pattern and vehicle characteristics; psychological characteristics, such as thrill-seeking and over-confidence; lower alcohol tolerance compared with older people; and inappropriate speed (the most common error of youth). WHO reports [1,19–21], among others, highlighted that population older than 10 years often participate in traffic independently as pedestrians, cyclists and motorists, and because of higher mobility and inexperience, accident risk for these road users is high. In addition, WHO reports [1,22–24] highlighted that inexperience and youth-related lifestyles increase the risk of road accident occurrence of young road users, particularly of males. Young people also have a high accident risk because of exposure to risk, such as the non-use of seatbelts and helmets, etc. Understanding the risks faced by young road users is important in order to plan appropriate actions to reduce road traffic deaths and injuries among young people. Other risk factors that could influence on young drivers’ road safety include biological factors, differences between males and females, personality, social norms, etc., as well as so-called acute impairments factors, such as alcohol, drugs, fatigue, distraction, emotions, etc.

Considering the gender of youth, males have three to four times greater fatality risk than females. Males accounted for 73% of all road fatalities, with an overall rate three times higher than females [2,5,18]. In all regions, the situation is the same; road fatality rates are higher for males than females. In particular, young males, in their first few years of driving, have higher rates of crash involvement than women. This ratio of males compared to females can be attributed to socio-cultural reasons and males being more on the roads, which increases risk-taking.

In EU countries, youth road fatalities mostly involve participant car occupants. For the age group of 15–24 years, almost 60% of youth road fatalities are with car occupants in the EU, and almost 20% of youth road fatalities are PTW users [18,25]. These facts could point to the risk for youth, and this information is important for planning and targeting prevention. In addition, several factors that influence youth road safety were highlighted: socioeconomic inequality (poor children have 4 to 20 times more likely to die in road accidents than others); fear of unsafe roads; and differential risk among modes of transport.

Almost all international reports, documents and scientific papers determined that education and road safety campaigns are the main measures for prevention, but they have to be used in the support of legislation, law enforcement and publicity [18,25–27].

In Serbia, and also in neighboring countries, there has been very few activities regarding youth road safety in recent years. Most of the activities were conducted in order to improve child road safety, but regarding youth road safety, only several indirect campaigns have been conducted (Table 2).

Table 2. Overview of some existing programs/studies in the neighboring countries.

Country	Activity	Aim
<i>Republika Srpska</i>	Campaign “One call change everything” (2019) “Not even 1 drink before driving” (2018)	-Unused mobile phones while driving -Anti-drink driving campaign
<i>Montenegro</i>	Campaign “Let the mobile ring” (2018) Campaign “When I drink, I do not drive” (2018)	-Unused mobile phones while driving -Anti-drink driving campaign
<i>FYR Macedonia</i>	“No excuses” (2018) “Safe driving—no driving with alcohol” (2018) “Mobile is not smarter than you” (2018)	-General campaign on traffic safety (against speed, alcohol and mobiles) -Anti-drink driving campaign -Unused mobile while driving
<i>Croatia</i>	“If you drink, do not drive” (2019) “Don’t send SMS messages while driving” (2018)	-Anti-drink driving campaign -Unused mobile while driving

In Serbia, there were only a few activities regarding youth road safety, but most of them were only local and without assessment of the effectiveness of such activities. A review of previous experiences in Serbia showed that the Association of Citizens and students from The Faculty for Pedagogy conducted research in Novi Sad about the risk behavior of youth regarding road safety [28]. The survey had a sample of 376 respondents, and the results showed that almost 37% of youth are not in the habit or just forget to use a seatbelt, 25% said that they do not use seatbelts because of short trips, 21% of respondents stated that the seatbelt disturbed them, and others said that they do not use seatbelts because there are no police, they have trust in their own ability, etc. Regarding driving under the influence of alcohol, youth usually stated that they do not have any other way to return home, they trust the driver regardless of whether the driver is under the influence of alcohol, etc. Reasons for youth speeding were mostly: being in a hurry, liking speeding, feeling that the limits are inappropriate, believing in themselves, etc. Reasons why youth usually use mobile phones while driving were: they expected an urgent call; they do not have hands-free devices; talking and driving does not disturb them, etc.

The Road Traffic Safety Agency–Republic of Serbia has conducted several youth road safety actions over the past few years [7,29], including the following campaigns for young drivers: “Youth, not craziness” (2014) and “Mind on the road” (2014, 2017, 2019); presenting driving and seatbelt simulators in the high schools, where more than 2000 young people tried simulations and more than 92% of them reported that they will use seatbelts in the

future. In addition, they conducted the campaign “In the car without alcohol” (2018), with the purpose of changing attitudes of young people regarding drinking and driving. There was a campaign called “Choose life” in 2018, where several road safety experts visited high schools in the territory of Serbia and where more than 1400 young people had one class about the importance of using seatbelts, speeding, drinking and driving, using helmets, etc. One of the most popular activities of the Serbian Committee for Road Safety was a campaign dedicated to young drivers called “Safe driver—I like him (her)” conducted via a website, involving a so-called “Fake driving test”. After the campaign, more than 92% of website visitors said that they changed their road safety behavior.

In the future, much better and much faster actions must be undertaken to ensure a better road safety environment for all road users and for young people also. The first document that deals with youth was the “National strategy for youth”, proposed by the Ministry of Youth and Sport and adopted by the government in 2008. This strategy discusses some general issues regarding youth, and highlighted that the young are often victims, especially in road accidents. On the other hand, “Road safety strategy—Republic of Serbia for the period from 2015 to 2020” [29] is a strategic document in Serbia that was written and adopted in Belgrade in 2015. This document covers the vision, mission and targets of road safety for the period 2015–2020. For all 17 municipalities, action plans were adopted, and some of the key areas included: young drivers, alcohol, speeding, vulnerable road users, etc. The most important legal framework about youth road safety in Serbia is the new “Road Traffic Safety Law” [30], adopted in 2020. The obligation and responsibility of each stakeholder who could have influence on road safety were specified by the RTSL. In particular, the obligation and responsibility of education to teach the appropriate knowledge, skills and habits that are required for safe participation in traffic were specified. The importance of improving and strengthening positive attitudes and safe behavior was emphasized. As one of the examples of direct protection of young drivers, RTSL introduced the beginner driver license (two years). For beginner drivers, there were also some restrictions: they cannot drive between 11 pm and 6 am; they are not allowed to drink and drive (BAC limit for beginner drivers is 0 mg/L); they cannot use mobile phones, including even hands-free devices; they cannot drive without a passenger in the front seat who has a full driving license; etc.

3. Methods

Figure 1 shows the development of the mixed research design, which was based on an extensive review of the academic literature and EU documents that deal with youth road safety, programs, policies and legal framework in Serbia.

3.1. Procedure

The research was conducted with respondents aged from 16 to 25. The databases of emails to which the questionnaire was sent were collected from driving schools, as well as from volunteer actions and sports events from the largest cities in Serbia. Potential participants were selected randomly, and they were not obliged to participate in the study. The study adhered to the Code of Ethics and Conduct of the Serbian Psychological Association which required that written consent was received from the parents of each minor child (aged less than 18) involved in the research. Respondents did not receive any compensation for participation.

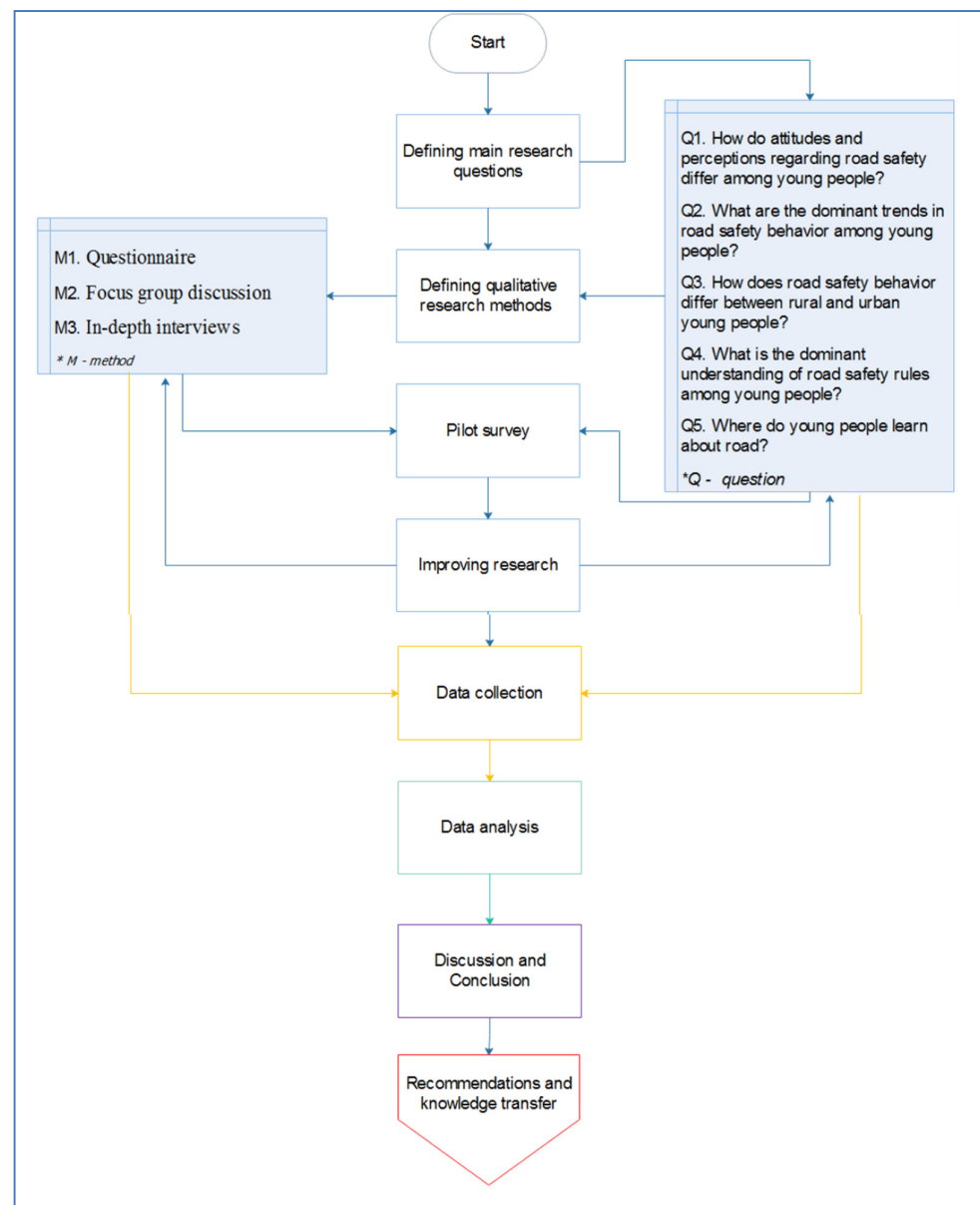


Figure 1. Flowchart research method diagram.

1. Questionnaires

In order to ensure a representative sample, the following sampling techniques were used for collecting respondents' answers:

- **Paper survey:** This form of questioning was conducted in Belgrade, Novi Sad, Niš and Kragujevac. These are the biggest cities in Serbia and have a population between 200,000 and 1,500,000. One of the objectives of the study was to determine whether there are any differences between rural and urban areas, and as such, those living in rural areas were invited to come to these cities and to participate in the survey. Respondents were most often students of high schools, colleges or driving schools. In these institutions, research guidelines were given, and the respondents volunteered to participate in the research. The survey was conducted in paper and pencil form, in the classroom, with a group of 30 respondents;
- **Information and Communication Technologies (ICT):** The survey was created via a Google-drive application and advertised on the websites of high schools, colleges and driving schools, as well as popular social media platforms and social networks

(Facebook, Instagram, Twitter). The questionnaire was posted on the pages of social networks intended for young people (e.g., the Youth of the City of Kragujevac), but also on the pages of institutions involved in traffic (e.g., the Agency for Traffic Safety, Traffic in Kragujevac);

- **E-mail surveys:** The mail body text included basic information about the survey, together with a link to the web-designed questionnaire form if someone did not want to visit website where the survey was uploaded. The database of e-mail addresses was taken from high schools, colleges and driving schools (only those e-mail addresses for which there was the consent of the students to share the addresses for the purpose of promotions and research).

Participants: A total of 525 questionnaires were completed (356 online and 169 one-to-one). However, 20 online respondents were older than 25 years, and these were removed from the dataset. The final sample comprised 505 participants, 56% of whom were male. The majority of participants were from urban areas (72%). Studies on related topics have a similar number of respondents [31–36]. Although a 50–50 urban/rural population split was planned, and achieved in the one-to-one sample, this was hard to control in online surveys. However, the number of 143 rural respondents was enough for further analyses.

2. Focus group discussion

Four focus groups were conducted with young people aged between 16 and 25 years. All focus groups had males and females as participants, as well as participants from urban and rural areas. Focus groups were held in the following cities: Belgrade, Niš, Novi Sad and Kragujevac. In each city, one focus group discussion was held. Information about conducting research was posted in high schools, colleges or driving schools. Focus group participants were selected by a random sampling of registered candidates. All of the participants were highly interested in road safety issues and very active in focus group discussions. Each of the focus group discussions lasted about one and a half hours, and all of them were audio-taped.

Participants: A total of 32 participants were involved in the focus groups (eight participants per city). Half of the sample were from urban areas (opposed to rural), and 62.5% were men.

3. In-depth interviews

In-depth interviews were conducted with a range of professionals, including directors, chiefs, deputy chiefs and ordinary members from a range of companies, as well as traffic police officers. Stakeholders (traffic police, first aid, road safety councils, school councils, local road safety administration, national road safety administration) at the local and national level were chosen to identify what activities are done to raise awareness of youth road safety. In-depth interviews were conducted in the four cities that are the regional centers in Serbia—Belgrade, Novi Sad, Niš and Kragujevac—as well as in two rural Belgrade municipalities. Interviews lasted for about one hour on average, and almost all of them were audio-taped (note: traffic police officer from Kragujevac asked not to be audio-taped).

Prior to the main study, pilot studies were conducted for each method. Testing with ten participants was conducted with the questionnaire, which involved one-on-one sessions discussing the interpretation of each potential item. The focus group questions were piloted on four participants, and held in Belgrade, to ensure the validity and relevance of the proposed questions. The one-on-one interview was tested on a stakeholder in Belgrade to ensure validity and relevance.

Participants: Fifteen stakeholders participated in in-depth interviews.

3.2. Materials

1. Questionnaire

The questionnaire contained 34 questions, seeking demographic information (gender, age, level of education and license tenure), crash and infringement notice history, the

perceived most important characteristics of a vehicle (nice design, fast car, safe car, comfort, specific make), driving style (fast, normal, slow) and gender differences in perceived driving style. Participants were also asked information about their own driving (frequency, main reason for driving) and whether their behavior changes according to trip type (yes, no) or presence of passengers (yes, no). Attitude questions were also included, such as respecting pedestrians, playing loud music while driving, showing off to friends by violating road rules (yes often, yes infrequently, no). Opinions of the most dangerous behaviors were also sought, with participants asked to select any that were appropriate (from speeding, not yielding to pedestrians, not complying with traffic signs, driving under the influence of alcohol or drugs, using mobile phones while driving, offensive driving). It also examined the behavior of young drivers when driving in a column (the leader of the column, somewhere in the middle, at the back of the column). The remainder focused on key behaviors and attitudes of interest, such as:

Seatbelt usage (as a driver and as a passenger in the front and back seats). The main reasons for wearing a seatbelt were sought, which included: friends or family approval, fear of a ticket, safety, legal requirements, and other. Participants were also asked whether they require passengers in vehicles to wear a seatbelt (yes, no);

Mobile phone use while driving. Participants were asked to select the most applicable attitude from the following options: they use their phone while driving because it will not interfere with the driving task, they use their phone but know it will interfere with the driving task, they do not use their phone while driving. They were also asked whether, as a learner driver, they can use hands-free when driving (yes, yes but only if older than 18, or no);

Driving under the influence of alcohol. Participants were asked about frequency (never, several times per week, several times per month, several times per year) of drink driving, whether they had been fined for driving under the influence and how often they had driven in a vehicle with a driver under the influence (never, a few times, many times) and why (did not want to offend, was in a hurry, did not want to walk, driver was a parent, other). Participants were also asked if they intervene when somebody attempts to drive when under the influence (yes, no);

Speeding: Information was also pursued about usual speed choice (I respect speed signs and do not speed, I speed when in a hurry, I speed when driving slow makes me tired, I speed when I can do so safely). Participants were also asked whether it was “cool” to drive fast (yes, no).

2. Focus group discussion

Apart from demographic data, 16 questions on traffic safety were asked within the focus groups (open-ended questions), in accordance with the aims of the paper.

Participants: A total of 32 participants were involved in the focus groups (eight participants per city). Half of the sample were from urban areas (opposed to rural), and 62.5% were men.

3. In-depth interviews

In-depth interviews were conducted in a similar manner as the focus groups; after collecting demographic data of respondents, they answered 16 open-ended questions, to examine their view of youth safety in traffic.

3.3. Data Handling and Analysis

Statistical analysis was carried out in the statistical software package IBM SPSS Statistics v22. There were no missing data in the final sample of 505 participants answers. The normality of distribution was tested by inspection of histograms and the Kolmogorov–Smirnov test. Since the data for all measured variables distribution were not normally distributed, nonparametric analyses were used. To assess the significance of differences, the chi-square test was used. The most significant responses from focus groups and in-depth interviews are presented in the study.

1. Questionnaire results

Table 3 shows the breakdown of the sample in terms of age, gender and location. Most of the respondents were aged between 20 and 22 years old (49%), with only 13% aged between 16 and 19 years old. The average age of the respondents was 21.78 (2.13) years.

Table 3. Sample distribution by age, gender and location.

Age	Urban		Rural		Total	
	Male	Female	Male	Female	Male	Female
16–19	22	10	18	9	40	19
20–22	84	91	41	32	125	123
23–25	91	64	27	16	118	80
Total	197	165	86	57	283	222

The results show that a notable percentage (16%) of young drivers reported having already been involved in a crash. Sixty-nine percent of those involved in a crash were from urban areas, and comparing this percentage with the survey sample size of the urban population (72%) suggests that rural youth are overrepresented in road accidents compared to urban youth. Moreover, it is also interesting that 48.8% of respondents involved in road accidents had held their license for less than five years, while 10.7% of respondents involved in road accidents had been licensed for less than one year.

According to research results, a notable percentage of respondents had received a traffic violation ticket (22%). Only 1.4% of respondents reported that they were punished for traffic violation more than five times. However, of those, 71.4% has also been involved in a crash.

What are the dominant trends in road safety behavior among young people?

The results showed that there are some dominant trends in youth road safety behavior. Those dominant trends are especially about speeding (Table 4), using seatbelts (Table 5) and drinking and driving (Table 6).

Table 4. Self-reported speeding among young drivers.

Age	Male	Female	Total
16–19	80%	53%	67%
20–22	76%	70%	73%
23–25	82%	70%	76%
Total	79%	64%	72%

Table 5. Self-reported seatbelt usage among young people.

Age	Driver		Passenger in the Front Seat		Passenger in the Rear Seat	
	Male	Female	Male	Female	Male	Female
16–19	74%	94%	71%	82%	10%	12%
20–22	85%	89%	74%	82%	10%	5%
23–25	84%	95%	77%	91%	7%	10%
Total	81%	93%	74%	85%	9%	9%

Table 6. Self-reported drinking and driving among young people.

Age	Male	Female	Total
16–19	25%	6%	16%
20–22	31%	10%	21%
23–25	39%	13%	26%
Total	32%	10%	21%

Speeding. As can be seen in Table 4, Speeding was common among respondents, with 72% of all participants reporting usually driving above the posted speed limit. Most of them were men. Comparing age groups, the oldest young people (age group 23–25) more frequently sped compared to others ($\chi^2 = 3.130$; $p = 0.792$). The main reasons for speeding are: “if I estimate that I could drive safe over speed limit, without consequences” (52%), “be in a hurry” (15%). However, there is a statistically significant gender difference for speeding ($\chi^2 = 10.485$; $p = 0.015$). Female participants reported complying with the restriction more than males (female = 30.9%, male = 20.9%).

Seatbelt usage: Most respondents reported that they always use seatbelts in the front seats, with 87% always using a seatbelt as a driver. A higher percentage of females (91.3%) compared to males (82.9%) used seatbelts ($\chi^2 = 7.551$, $p = 0.023$). Probing about why youth do not use seatbelts showed that the main reasons are: “I do not want to use it”, “because police officers know me”, “there is no enforcement”, “seatbelts strangle me”. Most (79%) respondents reported using seatbelts as passengers in the front seats. Analyses of gender differences also showed that females use seatbelts more than males as passengers in the front seats, and probing about why youth do not use seatbelts as a passenger in the front seats showed similar reasons for non-using as a driver. In contrast, only 9% of the respondents used seatbelts when sitting in the rear of a vehicle. There were three main reasons for this: “I do not have habit to use it in the rear seats”, “I think that it is not necessary” and “my car is not equipped with rear seatbelts”.

Driving when under the influence. Most (76%) respondents reported never driving under the influence of alcohol. Others (24%) had driven while under the influence of alcohol at least once. A higher percentage of males reported driving under the influence of alcohol when compared to females ($\chi^2 = 37.303$, $p < 0.001$). A very small percentage of respondents (2.4%) reported driving under the influence of drugs, and there were no differences in prevalence across males and females ($\chi^2 = 7.063$, $p = 0.070$). There are statistically significant differences between age and driving under the influence of alcohol ($\chi^2 = 16.776$, $p = 0.033$). The youngest participants, in a smaller percentage, drive under the influence of alcohol, unlike the older ones. The results of descriptive statistics are shown in Table 6. The majority (75%) of those who drove under the influence of drugs also drove under the influence of alcohol, demonstrating a broader pattern of behavior.

Almost half (45%) of the respondents reported using their mobile phone while driving, and most (55%) of them were males. This was a statistically higher prevalence than for females ($\chi^2 = 30.728$, $p < 0.001$). The reasons for this, albeit usage was rare, were mainly if something was urgent, or by using hands-free devices. On the other hand, there were no statistically significant age differences in mobile phone use while driving ($\chi^2 = 2.049$, $p = 0.727$).

How do attitudes and perceptions regarding road safety differ among young people?

Table 7 shows that perception and attitudes regarding road safety differ across gender. In general, males and females agreed that males are more aggressive and faster drivers than females (females 35.4%, males 64.6%), and, on the contrary, females are also risky because of the lack of experiences.

Table 7. Speed limit compliance ratio and travel purposes.

		Reason of Your Speeding			
		I always Respect Speed Signs	When I Am in a Hurry	When to Slow Driving Make Me Tired	When I Estimate that I Could Safely Drive with Speeding
Purpose of the Trip	to go to school	24.70%	24.70%	7.80%	42.90%
	to go to job	19.80%	19.00%	9.50%	51.70%
	to go to restaurant (café, etc.)	22.60%	14.20%	7.50%	55.70%
	to go shopping	37.30%	11.90%	1.50%	49.30%
	to go to recreation area (walking, running, football, fitness, etc.)	24.10%	10.70%	4.50%	60.70%

About a quarter of the sample did not change their behavior according to the purpose of the trip. For those who did, the main reason was “being in a hurry” (female = 31.6%, male = 68.4%).

Table 8 shows the responses regarding important characteristics of vehicles. The majority of the youth population (73%) put safety as one of the main important characteristics of their car (female = 51.5%, male = 48.5%). Others stated that a fast car (female = 9.5%, male = 90.5%), a nice design (female = 24.1%, male = 75.9%) and a comfortable car (female = 25.5%, male = 74.5%) were important. Thus, perception of road safety could also be defined indirectly through emphasis of the main important characteristics of the car.

Table 8. Relationships between gender and road safety attitudes.

	Chi-Square	Sig.	Females (%)	Males (%)
Fast driving	$\chi^2 = 3.064$	$p = 0.216$	35.4	64.6
The reason for speeding is “being in a hurry”	$\chi^2 = 10.485$	$p = 0.015$	31.6	68.4
The most important car characteristics	-nice design		24.1	75.9
	-fast car		9.5	90.5
	-safe car	$\chi^2 = 35.005$	51.5	48.5
	-comfort		25.5	74.5
	-name of the manufacturer		50	50
Use a seatbelt	$\chi^2 = 7.551$	$p = 0.023$	91.3	82.9
The leader of the column	$\chi^2 = 23.225$	$p < 0.001$	28.5	71.5

The questions regarding speeding and overtaking a convoy of vehicles (i.e., three or more vehicles in a convoy) on a road section where overtaking is prohibited constitute a measure of aggressive driving. Interestingly, about 16% of all young people reported being very aggressive drivers, as can be seen from the percentages reported in the table. The drivers who often drive very fast liked to compete as “who is first” and liked to be “at the head of the column” (female = 71.5%, male = 28.5%) (Table 8). Almost one quarter (23%) of the respondents tried to show off, mostly through speeding. The majority (78%) of these drivers were males, demonstrating that males had more propensity for showing off than females.

Figure 2 shows that awareness about road safety behavior among young people still exists. Because youth population recognized unsafe behaviors of young people, it could

be said that awareness about road safety behavior still exists among young people. Those who reported unsafe behaviors could also point to key areas for redirecting actions for improving youth road safety (alcohol, speeding, using mobile phone while driving, etc.).

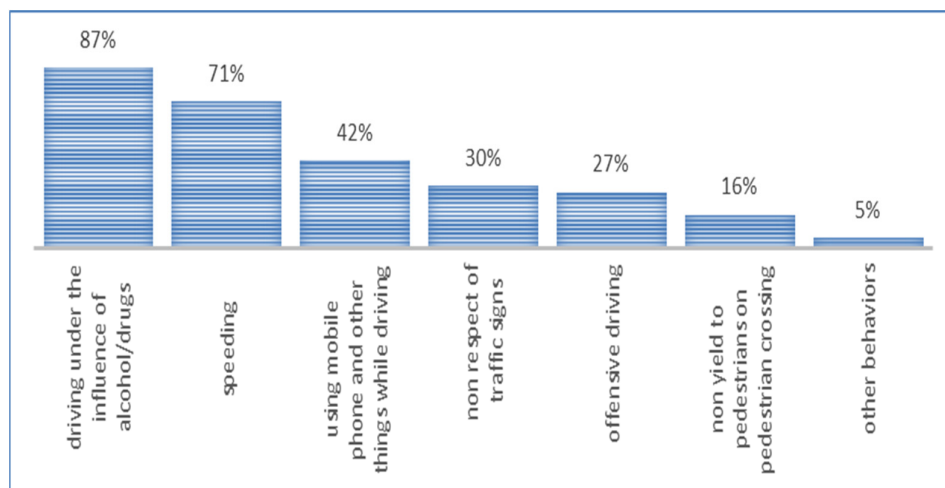


Figure 2. Reported unsafe youth behaviors.

How does road safety behavior differ between rural and urban young people?

Behavior was also compared across rural and urban residents. Differences were found for speeding, but not for seatbelt use ($p < 0.05$), driving under the influence ($p > 0.05$) or mobile phone usage ($p > 0.05$). Respondents in urban areas reported driving above speed limits more than rural respondents (urban = 75.9%; rural = 71.7%; there are no statistically significant differences, $\chi^2 = 1.05$; $p = 0.789$), although both samples reported almost the same reasons for driving above the speed limits: “being in a hurry” or “own estimation that it will be safe”.

What is the dominant understanding of road safety rules among young people?

Both rural and urban respondents agreed that males are mostly unsafe as drivers because of showing off, and females are unsafe because of the lack of driving experience. Male participants were significantly more likely to report showing off (male = 32.6%, female = 11.8%; $\chi^2 = 31.11$, $p < 0.001$). Male participants had more driving experience than female participants (males of about 4 years, female of about 3 years). In addition to the lack of understanding of the importance of safety behaviors and the lack of positive attitudes and perception of road safety issues among young people, comparing males and females, both agreed that males were more likely to behave unsafe than females. Both also agreed that the rural population is mostly unsafe because of small communities (everyone know each other, police officers too), and that the urban population is unsafe because of the lack of police enforcement (most of them respect traffic rules only if there are traffic police officers).

Where do young people learn about road safety and road safety behavior?

Youth usually do not learn from the road safety system (education, etc.), but they do learn from their experience. Less than 1% of the respondents saw from their parents how to behave safe, and approximately 27% improved their behavior because of police enforcement. In addition, those who started to behave safely as a result of enforcement now habitually use seatbelts, and do not speed or drive under the influence of alcohol. However, this behavior change took more than one enforcement situation, as less than 1% of the sample reported that they changed their behavior after their first traffic violation penalty.

4. Findings from the Focus Group Discussion

4.1. How Do Attitudes and Perceptions Regarding Road Safety Differ among Young People?

Findings from the focus groups largely supported the questionnaire findings. All participants agreed that males were more aggressive than females, often speeding, driving under the influence and displaying less respect for traffic rules. Males were also seen

as having better traffic situation awareness, communicating more effectively with other road users, and being more skilled than female drivers. Females were seen as driving more cautiously and carefully, with more respect for traffic rules compared to males. This suggests that overall, young people have some knowledge about road safety, but they have insufficient experience about safe behavior in traffic, especially as drivers.

4.2. What Are the Dominant Trends in Road Safety Behavior among Young People?

Dominant trends in road safety behavior among young people are that young people are the riskiest road users in general because they lack sufficient knowledge and practical experience. Despite being aware of the risks associated with speeding, driving under the influence, using mobile phones while driving and aggressive driving, they still engaged in these behaviors. The most frequent of these were: speeding, driving after drinking during weekend or in the evening, and also often using a mobile phone, both as a driver and as pedestrians. Seatbelt usage was not viewed as a problem because most of them used seatbelts, but only when sitting in the front seats. Almost no one reported using seatbelts in the rear seats. Lack of awareness about the dangers of speeding was evident as most participants mentioned that low-level speeding was not risky. Males reported driving under the influence more frequently than females, while female pedestrians reported less respect of traffic rules, crossing the street not using pedestrian crossings and crossing on the red light more often than males.

4.3. How Does Road Safety Behavior Differ between Rural and Urban Young People?

Differences emerged between rural and urban residents in terms of traffic violations, with more violations in rural areas. The main reasons for such rural population behavior are: small communities, knowing the traffic police officer, and lack of police on the streets. It was also noted that enforcement was lower in rural areas, even for the more serious violations. In contrast, urban youth often respect traffic rules in urban areas, but tend to speed on rural roads. Urban participants mostly used seatbelts for their own safety, but in rural areas youth mostly used seatbelts because of police enforcement and to avoid paying tickets. With regard to alcohol impaired driving, rural youth more often drink and drive compared to urban youth. These results, compared to the results of the questionnaire, show opposite findings.

4.4. What Is the Dominant Understanding of Road Safety Rules among Young People?

Although most of the youth are aware of the risks associated with violating traffic rules, from their discussion it was evident that most of them still do not respect traffic rules. In general, the young people thought that they were safe drivers, and their behavior does not jeopardize that. Their perception of risk is higher, because they are aware about consequences of risky behavior, but they do not always respect traffic rules. On the other hand, youth are aware that the road safety system in Serbia is not completely established. Additionally, young people are aware that there must be more school classes about road safety.

The most common unsafe behaviors youth are speeding and driving under the influence. Despite awareness of consequences of speeding, most of the participants reported that they speed on rural roads and when they are hurry, and some of them enjoy speeding and do so to show off. Some of them, especially males, are not satisfied with speed limits, and they think that speed limits have to be higher and that system has to protect vulnerable road users by using different methods, not only by speed limits. As pedestrians, youth frequently disregard the rules due to low police presence and subsequently low risk of enforcement. The biggest influence on youth road safety behavior was the influence of the environment and society, and young males often accept and decide to conduct some of risky behavior in order to show off.

One of the main problems about youth drinking and driving is drinking culture. In other words, youth have a problem because grandparents drink and parents drink. Serbia

has a long tradition of drinking, and those social norms have to be changed. Several focus group participants highlighted that world economic crises influence road safety in Serbia indirectly because economic stresses lead to decisions to drink more, regardless of the potential safety costs.

4.5. Where Do Young People Learn about Road Safety and Road Safety Behavior?

Young people said that they do not have the chance to learn about road safety from anybody. Educational campaigns for road safety do not exist, and family (parents) may not have the time to educate children, especially regarding road safety education, due to work commitments. Parents and family have to take their responsibility also, starting from the early age of their children, and to model safe behaviors. This is further complicated because family (parents) themselves may not hold the positive road safety attitudes necessary to provide good examples for their children.

The best opportunity for young people to learn about road safety is currently in driving schools. However, this training is not yet at an adequate level as training focuses mainly on skills and does not include higher order processes. The knowledge is focused on passing the test, rather than instilling better attitudes towards safe driving.

All participants agreed that campaigns can have a stronger influence on them to correct their behavior, but they also think that without proper enforcement, road safety will not improve. Therefore, while police enforcement would have more influence on older road users, and that is only way to force older people to behave safely, for younger people, campaigns and education could give better results in order to improve road safety.

5. Findings from the In-Depth Interviews

5.1. How Do Attitudes and Perceptions Regarding Road Safety Differ among Young People?

The reasons for youth road trauma risk were explored. Responses involved lack of knowledge, lack of experience, willingness for showing off, adrenaline, lack of a systematic approach for solving road safety problems, lack of experience, societal influences and improper education in driving schools. In addition to alcohol and speeding, young people also have a problem with seatbelts, helmets and mobile phones.

5.2. What Are the Dominant Trends in Road Safety Behavior among Young People?

The qualitative data supported the questionnaire and focus group findings. Males were viewed as being more aggressive drivers, speeding and driving over the speed limit more frequently and trying to show off, especially in front of females. Males were also seen as having better situational awareness and more driving experience. Most participants also reported driving under the influence of alcohol and speeding as the main key road safety problems in Serbia. In addition to the abovementioned factors, usage of seatbelts, helmets and mobile phones while driving are also areas where road safety could be improved.

“Young males drink, drive fast, do not use seatbelts and they are mostly weekend offenders and young females do that also but less than males” (senior official, traffic police).

The recognized profile of a young unsafe road user was a male driver, aged 18–25 years, who, after few drinks in the evening and at weekends, sits in a fast car and drives above the speed limit without using seatbelt, but using a mobile phone.

5.3. How Does Road Safety Behavior Differ between Rural and Urban Young People?

Differences between behaviors of urban and rural drivers were also noted in the interviews. Reasons for this were usually small communities where people know each other, and as a result, the rural population make more traffic violations compared to the urban population. The rural youth population often drink and drive, they often speed, but they also do not often pay, because the police officer is their cousin, neighbor or friend. On the contrary, urban drivers do not like the “low” speed limits in urban areas, but they usually try to comply with them; however, when they drive on the rural roads, they often exceed the posted limit.

5.4. What Is the Dominant Understanding of Road Safety Rules among Young People?

Most of those interviewed agreed that females are safer drivers than males. Males were more likely to be aggressive drivers, often drink and drive, often drive above speed limits and do not respect other traffic rules compared to females. On the other hand, males, as a rule, have more experience, better driving skills and better perception of traffic situations compared to females. Females often do not respect traffic rules as pedestrians, i.e., crossing at red lights, compared to males; however, in general, females are mostly careful drivers. Females are more cautious, careful, they more respect traffic rules and they are less aggressive drivers. Differences between gender are less than before, with a decreasing trend of such differences. In the future, the equal behavior of males and females in traffic is expected.

5.5. Where Do Young People Learn about Road Safety and Road Safety Behavior?

Interviewed stakeholders agreed that young people do not have chance to learn about road safety, they could only learn in driving schools. But on the contrary, driving schools are at the first place of the main reasons of high accident and fatality risk of young people, because driver training is very poor and training is aimed getting license only, not for safe driving. Interesting is that several stakeholders recognized role of parents and family as one of the main reasons for youth vulnerability. Education has to start from the childhood and parents have to take primary and adequate actions to teach their children about road safety. Parents must not provide a poor example of unsafe behavior in front of the children, i.e., crossing the street at red light together with their own children. So, the main reason for youth vulnerability is non-providing opportunity for young people to learn about road safety.

6. Discussion and Conclusions

The main aim of this study was to understand reasons for unsafe driving behavior in young people in Serbia. To do this, a comprehensive approach was taken using both quantitative and qualitative research methods for gathering in-depth data, which could help in determining the problem and in proposing adequate countermeasures. The key questions were whether there are any gender and rural/urban differences in behaviors and attitudes surrounding these behaviors. This provides further information to design appropriately targeted countermeasures. Table 9 presents a summary of the compared findings of the study by applying all three qualitative measures regarding the main five research questions.

Table 9. Findings from the study by applying all three qualitative measures.

Research Question	Findings from Questionnaires	Findings from Focus Group Discussions	Findings from In-Depth Interviews
<i>How do attitudes and perceptions regarding road safety differ among young people?</i>	Perception and attitudes regarding road safety differ among young people.	Perception and attitudes regard road safety differ among young people.	Youth accident risk and fatality risk are at a very high level.
<i>What are the dominant trends in road safety behavior among young people?</i>	There are some dominant trends in youth road safety behavior. Speeding represents one of the main youth unsafe behaviors. A very small number of respondents uses seatbelts in the rear seats. There is a road safety problem with drinking and driving among young people also. A not so small number of youth use a mobile phone while driving and most of them are males.	The dominant trends in road safety behavior among young people are that young people are the riskiest road users in general because they do not have proper and enough knowledge; also, they do not have enough experience for safe participation in traffic.	Males are more aggressive drivers, they often speed, drive under the influence, and show off, especially in front of females. The recognized profile of a young unsafe road user is a male driver, aged 18–25 years, who, after few drinks in the evening and during weekends, sits in a fast car and drives above the speed limit without using seatbelt, but using a mobile phone.

Table 9. Cont.

Research Question	Findings from Questionnaires	Findings from Focus Group Discussions	Findings from In-Depth Interviews
<i>How does road safety behavior differ between rural and urban young people?</i>	Results showed that some minor differences regarding road safety behavior between urban and rural population exist.	There are some differences because rural youth make traffic violations more often in rural areas than the urban population make in urban areas.	Differences between urban and rural young people regarding road safety behavior also exist.
<i>What is the dominant understanding of road safety rules among young people?</i>	Most of the youth population respects all traffic rules in general, but mostly to avoid paying violation tickets. Both populations agreed that males are mostly unsafe as drivers because of showing off, and females are unsafe because of lack of driving experience.	Although most of the youth were aware of not respecting traffic rules, from their discussion it could be concluded that most of them still do not respect traffic rules. The most common unsafe behavior of youth is speeding and drinking and driving. One of the main problems about youth drinking and driving is the drinking environment.	Most of the interviewed participants agreed that females are safer than males.
<i>Where do young people learn about road safety and road safety behavior?</i>	Youth usually do not learn from the road safety system (education, etc.), but rather from their experience.	Young people said that they do not have chance to learn about road safety from anybody. Young people have only one chance to learn something about road safety and that is driving school. All participants agreed that campaigns can have a strong influence on them, but they also think that without proper enforcement, road safety could not be better.	Interviewed stakeholders agreed that young people do not have chance to learn about road safety, and can only learn in driving schools.

In short, the following can be concluded on the basis of the results of the conducted study:

- The youth population in Serbia has significant road safety problems;
- Attitudes and perceptions regarding road safety differ among young people;
- Dominant trends in road safety behavior among young people are alcohol impaired driving, speeding, non-using seatbelts and using a mobile phone, and those are the main risky behaviors of young people;
- Comparing the urban and rural population, road safety behaviors do not differ much between rural and urban young people, but some minor differences exist;
- The dominant understanding of road safety rules among young people are that young people respect traffic rules mostly because of avoiding paying violation tickets;
- Young people have no chance to learn about road safety and road safety behavior outside of driving schools.

Bearing in mind the results about attitudes and perceptions of youth road safety and also the road accident and fatality risk of young people, it could be concluded that youth road safety in Serbia is at a low level. As such, some urgent actions must be conducted regarding improving road safety behavior among young people. Those actions have to highlight the importance of road safety issues, and also ensure the improvement of road safety among young people by reducing number of road accidents and their consequences on the road.

Taking into account all of the abovementioned findings, this study proposes several main recommendations for improving youth road safety in Serbia:

- Establishing a road safety system proposed by the Road Traffic Safety Law as soon as possible;

- Conducting road safety campaigns for improving the road safety of young people;
- Improving road safety educational programs, starting from preschool age;
- Improving and increasing traffic police enforcement.

The best and the fastest ways for influencing youth road safety behavior are by conducting well organized road safety campaigns among young people. Results of this study identified the main unsafe behaviors among young people, and also showed that males are more unsafe than females and that there are not large differences between urban and rural populations (which is in accordance with the results of the study [37–40]); these results suggest the following possible road safety campaigns:

- Campaign against drinking and driving with a focus on males;
- Campaign against speeding with a focus on males;
- Campaign for raising the usage of seatbelts with a focus on males, and especially with a focus on the usage of seatbelts in the rear seats;
- Campaign against using mobile phone while driving with a focus on males;
- Campaign for youth pedestrians, especially with a focus on females.

The proposed campaigns are very urgent because of the need to immediately stop, or at least mitigate, the suffering of young people in road accidents. The proposed campaigns could be separate for each unsafe behavior, but also one campaign could cover several behaviors.

In conclusion, it could be considered that this study identified the very unsafe behavior, and also the non-adopted positive attitudes and perception of road safety behavior among young people in Serbia [41–45]. These conclusions indicate that, in the future, young people must be at the top of the list of road safety problems, and also at the top of the list for future actions regarding road safety in Serbia.

6.1. Limitations

There is a possibility that when filling out questionnaires (especially online questionnaires), responses may have been influenced by a social desirability tendency, despite the anonymity of their submission [46]. Moreover, it is possible that they did not adequately quantify behavior in traffic. There are also concerns regarding the age of the respondents (the honesty of answers regarding the age of the respondent). Another limitation of the study may be the sample size for each of the data collection methods (questionnaire, focus groups and in-depth interviews).

6.2. Future Research

Future research directions should include a larger sample, a larger age group, and a larger number of questions. In addition, future research should include a mutual comparison of the results gathered by the three methods of data collection (questionnaire, focus groups and in-depth interviews), so that each of the methods would contribute (from its own domain) to improving the traffic safety of young drivers. It is also necessary to compare the results obtained by the paper and web-based questionnaires.

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