



ROAD SAFETY KNOWLEDGE AND ATTITUDES AMONG DRIVERS

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DOI: 10.38045/ohrm.2023.2.04

CZU: 656.1.045.6+614.86

Keywords: drivers, road safety, road traffic injuries, risk factors.

Introduction. Road traffic injuries are a significant issue for society in the twenty-first century, but public health experts frequently ignore them despite the fact that massive and coordinated efforts are required for their effective and long-term prevention. Human factors and poor driving performance are the most significant contributors to car accidents globally, as shown by a series of studies exploring the causes of traffic road accidents. Since road safety is a key concern in developing countries, our research focuses on the car driver behavioral risk factors in the Republic of Moldova.

Material and methods. A cross-sectional quantitative descriptive using a questionnaire was applied online via a Google form document among car drivers, between January-March 2022. Microsoft Excel was used for the statistical analyses.

Results. The questionnaire was completed by 257 respondents above 18 years, of which 61.9% were female and 38.1% were male, mostly with a category B license (73.5%) and majority from urban area (87.5%). More than half (55.6%) mention that drove a car daily and 30% of them have a drive experience of more than ten years. Respondents express great concern (71.2%) about the issue of traffic accidents, and 76.3% think that unsafe roads are a key contributing factor. At least once being involved as a driver in road accidents where medical care was needed was mentioned by 2.7% of respondents.

Conclusions. Educational programs and awareness campaigns about road safety among drivers and other vulnerable road users should be systematically organized.

Cuvinte cheie: șoferi, siguranță rutieră, traume rutiere, factori de risc.

CUNOȘTINȚELE ȘI ATITUDINEA ȘOFERILOR PRIVIND SIGURANȚA RUTIERĂ

Introducere. Traumatismele rutiere reprezintă o problemă semnificativă pentru întreaga societate în secolul XXI, problemă ignorată deseori de experții în sănătate publică, în ciuda faptului că eforturi comune, eficiente de coordonare sunt necesare pentru prevenirea acestora pe termen lung. Factorii umani și performanța slabă de conducere a unei mașini sunt cei mai importanți factori care contribuie la accidentele rutiere la nivel global, potrivit mai multor studii cu privire la cauzele accidentelor rutiere. Deoarece siguranța rutieră constituie o preocupare cheie în țările în curs de dezvoltare, cercetarea noastră se concentrează pe studierea factorilor de risc comportamental în rândul șoferilor din Republica Moldova.

Material și metode. Un studiu transversal, descriptiv, cantitativ a fost efectuat în perioada ianuarie- martie 2022, prin aplicarea online a unui chestionar creat prin instrumentul Google Forms în rândul șoferilor. Microsoft Excel a fost utilizat pentru analiza statistică a datelor.

Rezultate. Chestionarul a fost completat de 257 de respondenți cu vârsta mai mare de 18 ani, dintre care 61,9% femei și 38,1% bărbați, majoritatea cu permis de conducere de categoria B (73,5%) și majoritatea din mediul urban (87,5%). Mai mult de jumătate (55,6%) menționează că au condus o mașină zilnic și 30% dintre ei au o experiență de conducere de peste zece ani. Respondenții își exprimă marea îngrijorare (71,2%) cu privire la problema accidentelor rutiere, iar 76,3% consideră că drumurile nesigure constituie un factor cheie contribuativ. Cel puțin 2,7% dintre respondenți au raportat că o dată au fost implicați în calitate de șofer într-un accident rutier în care a fost nevoie de îngrijiri medicale.

Concluzii. Se impune organizarea sistematică a programelor educaționale și a campaniilor de conștientizare privind siguranța rutieră în rândul șoferilor și al altor participanți vulnerabili ai traficului rutier.

INTRODUCTION

Road traffic and the safety of the entire nation in the light of new challenges require thorough attention in studying and identifying the main niches in their prevention. Every year, the issue of road safety worsens and causes a lot of human suffering, furthermore medical care, healthcare costs a colossal amount of money (1, 2, 3, 4). The World Health Organization's Report on Road Safety estimates that 50 million people suffer from all forms of injuries and 1.35 million people die in traffic accidents each year (1). One in four young people experience a recurrence of a previous vehicle accident as a result of a road injury, which accounts for 23% of road accident mortality in adolescents between the ages of 18 and 24 (3, 5). Different risk factors are associated with risky driving, for ex. driving while impaired by alcohol increases the risk of an accident that results in death or serious injury; each 1% increase in average speed increases the risk of a fatal accident by 4%; a 3% increase in the risk of a serious accident; and failing to buckle up increases the risk of death among drivers in particular for front seat occupants by 50% (1). Younger drivers are more vulnerable to side effects when operating a vehicle than older drivers; 3 times as many people between the ages of 18 and 20 and 2 times as many between the ages of 21 and 24 die in motor vehicles as those between the ages of 25 and 65 (6). Previous studies on risk factors in road crashes and injuries highlight 3 major factors: the human factor and its behavior, the condition of the road and environmental factors, and factors conditioned by the vehicle (7-10). In the literature, numerous factors are described that contribute to the occurrence of road accidents (1, 11). According to the World Health Organization's Global Road Safety Report (1, 2), the main causes of road trauma are traffic violations, drunkenness, road conditions and environmental factors (ice, fog, technical vehicle malfunctions, time of year, street lighting status). Due to the fact that behavioral factors are among the most important one in road injuries, their identification and the development of cross-sectoral prevention measures can contribute to road safety. Speeding is almost universally recognized as the most significant. Adapting speed in different environmental conditions plays a colossal role. Studies show that of all the risk factors associated with road injuries, one third of accidents are related to excessive speed

(2, 12), and the risk of causing serious or fatal injuries increases with increasing speed and decreases while reducing it. In terms of the number of deaths that were reported as a result of traffic accidents per million people in 2019, the Republic of Moldova ranked first among EU member states. At the national level, statistical data on the mortality of the population due to the type of injuries and poisonings, road accidents are placed second both per country and Chisinau municipality. In Chisinau municipality are registered the greatest number of accidents (4, 13). According to the National Public Security Inspectorate data reported for 2018-2020, the major causes of road crashes are inadequate speed, environmental conditions, road infrastructure, not respecting the traffic rules and the most affected group being around 50% among people aged 31-64. Government of the country has set a goal to significantly reduce deaths and injuries caused by road accidents for the next decade: joined the Decade of Actions for Road Safety, assuming responsibility for fulfilling the objective of reducing the number of road accidents by 50% by 2030, supports the "Zero Progressive Vision" Strategy, signs the Eastern Partnership Declaration on Road Safety - through which our country sets out to strengthen road safety management and to develop road safety measures. *The aim of this research* was to assess the behavioral risk factors among car drivers and to propose preventive measures to road safety.

MATERIAL AND METHODS

This is a cross-sectional quantitative descriptive study that included the development and application of a questionnaire entitled "Behavioral risk factors among drivers from the Republic of Moldova". The study population was car drivers, which has driven a car at least once within the last 12 months. People who do not fulfil this inclusion criteria were not included in the research. Collected period was January – March 2022. The questionnaire was applied online via a Google form document and distributed through using social networks (Facebook, Messenger) and the *Nicolae Testemitanu* State University of Medicine and Pharmacy Internal Information System and the following variables were monitored: demographic (gender, age, individual's life situation and living conditions, occupation, personal situation, education, place of living), driving

experience (type of vehicle, number of kilometers travelled per year, involvement in any road accidents, road behavior, safety devices used) and involvement in road accidents and collisions among drivers. For the data analysis it was used Microsoft Excel, and the secondary data – variables from the questionnaire. We also analyzed the behavioral risk factors among car drivers referring to speeding, seat belts use and child restraints, alcohol drinking, fatigue and environmental issues.

RESULTS

The data collection instrument developed during the research was completed during the study period by 257 respondents, 19.8% aged 18-24, 36.6% aged 25-34, 25.3% aged 35-44, 14.8% aged 45-54 and 3.5% aged above 55. There were 61.9% females and 38.1% males. Medical professionals made up 43.20 of the participants,

followed by students with 11.3% and teachers with 17.1%. The majority (91.1%) mentioned a higher level of education, and married status (69.6%), and live in either an urban or a rural area (87.5% and 12.5%, respectively) (tab.1).

In the Figure 1, we can observe that the category B license was held by the majority (73.5%), followed by subcategory B1 license (10.9%).

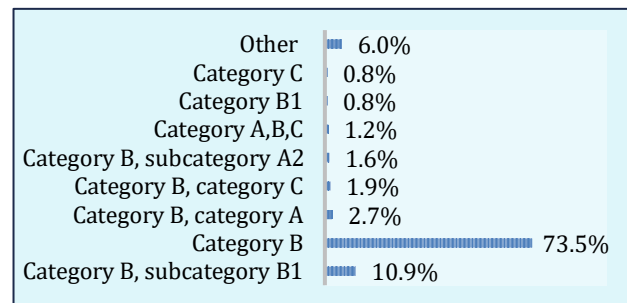


Figure.1. The types of driving license categories of the respondents.

Table 1. Demographic characteristics of the respondents (n=257).

Group age, years old	N	%	Gender	N	%
18-24	51	19.8%	Male	98	38.1%
25-34	94	36.6%	Female	159	61.9%
35-44	65	25.3%	Area		
45-54	38	14.8%	Urban	225	87.5%
55-64	6	2.3%	Rural	32	12.5%
65+	3	1.2%			
Level of education	Occupation				
Secondary	1	0.4%	Driver	12	4.7%
High	12	4.7%	Police	5	1.9%
Colleges	10	3.9%	Teacher	44	17.1%
Bachelor	234	91.1%	IT	4	1.6%
Civil status	Medical professionals				
Single	23	8.9%	Lawyer	5	1.9%
In a relationship	37	14.4%	Constructor	3	1.2%
Concubinage	9	3.5%	Retired	1	0.4%
Married	179	69.6%	Household	6	2.3%
Divorced	6	2.3%	Student	29	11.3%
Widower	2	0.8%	Other	37	14.4%
Other	1	0.4%			

In terms of how often they drove a car in the last year, we can observe that 55.6% of them did it daily and 20.2% did it 1-4 times per week (fig.2).

Respondents reported a driving experience of more than ten years in 30%, one to three years in 19% (fig. 3). At the same time, half of the drivers (54.5%) said that they drive up to 10 thousand

kilometers annually (fig.4). Respondents express great concern (71.2%) and moderate concern (24.5%) about the issue of traffic accidents, and 76.3% think that unsafe roads are a key contributing factor. Based on the responses, we can deduce that national roads (70.04%) and important streets in cities (21%) are the places where the speed limit is violated mostly. Out of the total, 173

persons think the responsible bodies, such as the government, police, etc. are incompetent and uninterested in promoting road safety.

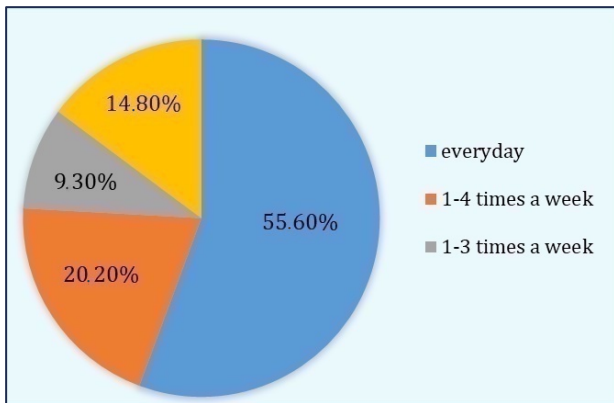


Figure. 2. The frequency of driving a car during the last year.

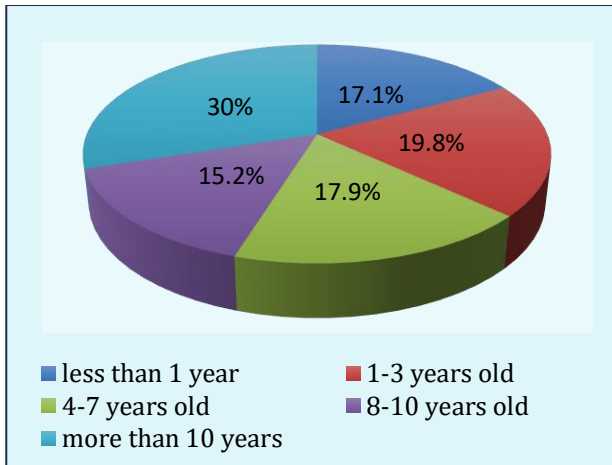


Figure. 3. Years of driving experience.

When asked about an "alcolock" that would prevent the car from starting if the driver was over the legal drink drive limit, 80.2% supported the idea, and for fatigue detection devices that would

warn the driver to stop if they were too tired to drive – 62.6%. Regarding the existence of a "black box" in the car to identify the cause of an accident, only 49.4% respondents agreed. As for speed limiters installed on cars, 40.9% of respondents were pleased with this concept.

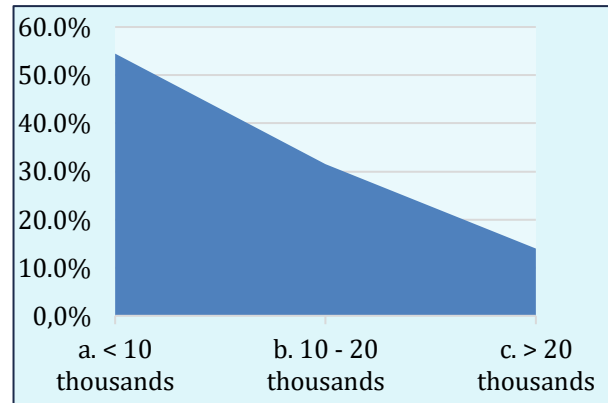


Figure. 4. Kilometers estimated by respondents to have been driven in the last 12 months.

In the last 12 months, 84.05% have never been subjected to a breathalyzer test while driving. As well, asked about drinking while driving (fig. 5), the most respondents answer was 0 units of alcohol/day (75.1%) and no drinking at all (78.6%).

Regarding road accidents in which they were involved as a driver without suffering any injury, they state that in the last 12 months (tab. 2), 87.9% were never involved, one involved in – 11.3% and twice in 0.8%. At least once they were involved as a driver in road accidents where medical care was needed – 2.7%, and never – 97.3%. Among those involved in an accident in the last 12 months, they reported another vehicle as a co-participant (45.7%) or without the involvement of another party (44.6%)

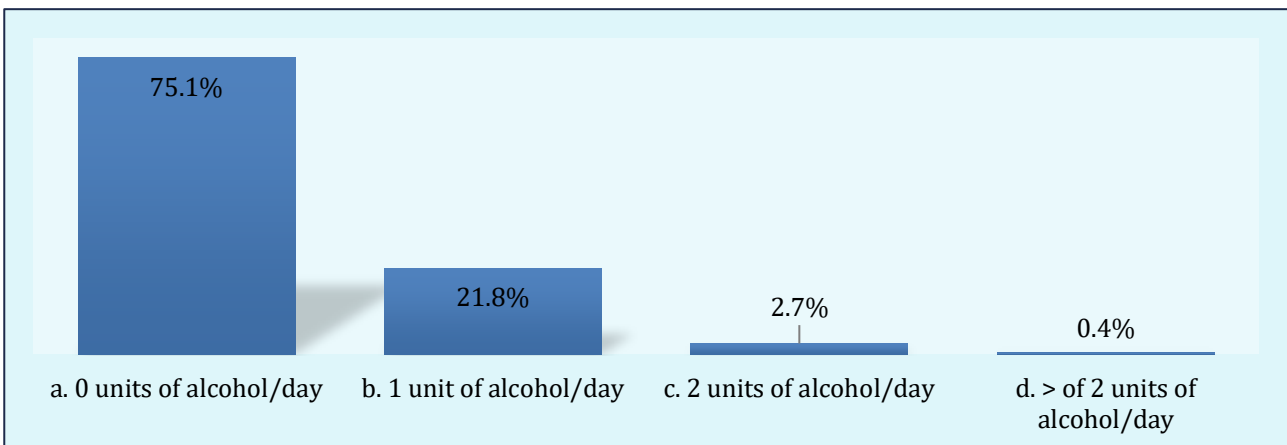


Figure. 5 Drinking alcohol while driving.

Table 2. Specific characteristics of the driver's behaviour.

	N	%
In the last 12 months, how many non-traumatic accidents requiring medical attention have you been involved in as a car driver? (n=257)?		
Never	226	87.9%
Once	29	11.3%
2 and more times	2	0.8%
In the last 12 months, how many accidents where you involved in as a car driver in which someone, including yourself, was injured and received medical assistance? (n=257)		
Never	250	97.3%
Once	7	2.7%
If in the last 12 months you were involved in a car crash, who/what were co-participants in? (n=92)		
Pedestrian	5	5.5%
Another vehicle	42	45.7%
Other non-motorized transport (electric scooters, hoverboards)	4	4.3%
No other participant	41	44.6%
How often do you fasten your seat belt? (n=257)		
Rare	9	3.5%
Occasionally	15	5.8%
All the time	233	90.7%
How dangerous do you think it is to drive while taking a drug that carries a "warning: may affect your ability to drive"? (n=257)		
Very much	112	43.6%
Quite enough	102	39.7%
Not much	17	6.6%
Not at all	12	4.7%
Do not know	14	5.4%

The respondents had the opportunity to estimate in which situations there is a higher risk of injury (tab. 3). The lack of cycling tracks also bothered our respondents, who believe that cycling has a fairly large influence in road accidents with 51.8% and very large with 24.9%. At the same time, 52.1% consider public transport less dangerous in terms of the risk of accidents, and the biggest impact proved to be cars with 59.1% and motorcycles with 65.8%.

According to the national law, before departure and while traveling by car, the driver of the vehicle

is obliged to wear the seat belt and to ensure that the passengers have also fastened their seat belts. In accordance with our findings, 90.7% of respondents are responsible and always fasten their seatbelts, however 5.8% only do so occasionally and 3.5% very rarely.

From the total respondents, 43.6% believe that driving while the driver is under drug treatment can influence driving, and another 6.6% believe that it does not influence much. A number of 5.4% do not know about the impact of drugs that carry a warning or contraindication while driving a car.

Table 3. The level of danger considered by the respondents regarding a possible risk of injury.

	Walking		Cycling		Public transport		Cars		Motorcycles	
	N	%	N	%	N	%	N	%	N	%
Not at all	25	9.7%	3	1.2%	12	4.7%	3	1.2%	4	1.6%
Quite enough	75	29.2%	133	51.0%	88	34.2%	152	59.1%	73	28.4%
Very much	19	7.4%	64	24.9%	23	8.9%	74	28.8%	169	65.8%
Not much	138	53.7%	57	22.2%	134	52.1%	28	10.9%	11	4.3%

DISCUSSIONS

This study underlines the extent of injuries caused by road accidents among drivers, as they are considered a vulnerable group participating in traffic (14, 15).

The results of this research help to understand the car's driver perceptions and attitudes while driving and concentrate to practical solutions for traffic safety. Previous studies state that there is progress in road safety and as a result in the reduction of injuries and deaths among people involved in motor vehicle accidents. At the same time, emerging from the increased interest of women in driving, there is a need to study the subject approached from a comparative aspect, namely if women are more vulnerable in relation to men. For example, according to Nneka, 2022 research – women have a 47% higher risk than men and five times higher risk of injury, yet they are less likely to receive effective post-crash care in the event of crash-related injury due to lack of health insurance. This is even more prevalent in Africa, where there is limited access to medical insurance (16).

Data from another study (17) shows that women are up to 37% more vulnerable to a car traffic injury. Same study results, mention that for certain types of injuries, the increased risk is even higher; for example, female drivers are 98.5% more likely to suffer leg injuries in a traffic crash. And this fact is due to the intention of women to drive small cars, used only for personal purposes, and men end up driving large cars, such as trucks, where the risk of suffering a tragic accident is much lower. Thus, the data reflected by our study (61.9% females and 38.1% males) leads us to direct preventive measures and cultivate the pro-

motion of road safety with a stronger focus among female drivers.

Our study identified that 11.3% of the drivers were involved at least once in a crash, similar data was reported in study held among professional car drivers in Ethiopia, according which 16.3% (18). The same authors in their study (18) identify that 32.7% drive up to 10 thousand kilometers annually, while according to our study – half of the drivers (54.5%).

The characteristics of the driver identified in our study can tell us that in most of all the crash causes and related injuries are directly related to the behavioral factors, this being also identified in the specialized literature (4, 12, 19).

According to the European Commission data regarding traffic safety (20), the number of deaths caused by road accidents in 2021 increased by 5% compared to the previous year. The same source, mentions that car occupants (drivers and passengers) accounted for 43% of all road traffic deaths, while pedestrians accounted for 20%, two-wheeled vehicle (motorcycles and mopeds) drivers 18% and cyclists 10% of all deaths. Men caused three out of four road deaths (77%), which points to the much greater focus of women behind the wheel, even if for them there are more external factors that can influence it. While 12% of people killed on EU roads were aged between 18 and 24, this age group represents only 7% of the EU population. Thus, statistics show us that young people are more likely to be involved in a fatal road collision and pretty similar data was found by our study (19.8% aged between 18-24 and 36,6% aged between 25-34).

CONCLUSIONS

1. There are many factors that contribute to the occurrence of road accidents, among which behavioral factors of the driver plays an essential role.
2. Behavioral aspects of the drivers in relation to road safety were underlined, this will help to create a driver profile and change their risky behavior.
3. There is a need to incorporate the identified results into various practice actions, to inform and educate the general public and vulnerable road users, and to develop appropriate measures to maintain road safety

CONFLICT OF INTERESTS

All authors declare no competing interests.

ETHICAL APPROVAL

This research is part of a larger research study entitled Road traffic injuries and the promotion of healthy road safety behaviors in the Republic of Moldova, for which the approval of the National Research Ethic Committee was obtained within the *Nicolae Testemitanu* State University of Medicine and Pharmacy, decision no 2 from 04.03.2020.

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ACKNOWLEDGEMENTS

The work reported in this publication was funded by the NIH-Fogarty International Trauma Training Program “iCREATE: Increasing Capacity for Research in Eastern Europe” at the University of Iowa (2D43TW007261-11). The authors gratefully acknowledge all members of the iCREATE for their work on the project overall and for the contributions of project documentation used in this manuscript.

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Date of receipt of the manuscript: 18/10/2022
Date of acceptance for publication: 27/01/2023

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