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Use of mobile phones by vehicle drivers

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Abstract. The issue of mobile phone use by drivers emerged in the 1980s and remains a significant concern in the context of road safety. The contemporary development of technology has made mobile phones an inseparable part of daily life, creating new challenges regarding their use while driving. The hypothesis adopted in this study assumes that using a mobile phone while driving significantly increases the risk of road accidents, primarily by distracting the driver. The research methods used in the analysis included conducting a survey among drivers to determine the frequency and circumstances of mobile phone use while driving. The study also identified psychological and behavioral factors influencing this risky behavior. The survey results showed that over 30% of respondents admit to using their phones while driving, which leads to distraction from the road, reduced caution, and more frequent driving errors. The scientific contribution of this study lies in providing updated data on the scale of the problem and emphasizing the importance of the psychological and habitual aspects of mobile phone use by drivers, which have been marginally analyzed in the literature so far. The innovation of this work is reflected in highlighting the need to develop new prevention strategies and technologies that effectively limit mobile phone use while driving, which could significantly contribute to improving road safety.
Keywords: mobile phones, road accidents, driver distraction, mobile phone usage, road safety

Introduction

Using a mobile phone while driving is dangerous. Driving is a highly complex task that requires full attention, as any mistake can have catastrophic consequences (McEvoy, Stevenson, McCartt, Woodward, Haworth, Palamara, Cercarelli, 2005; Briggs, Hole, Land, 2016). Drivers talking on the phone, whether using a hands-free device or holding the phone, are at a higher risk of being involved in road accidents (Frej, 2024; Frej, Jaśkiewicz, Poliak, Zwierzewicz, 2022). The main issue drivers face when using a phone behind the wheel is the distraction from the task

of driving (Gaspar, Street, Windsor, Carbonari, Kaczmarski, Kramer, Mathewson, 2014; Asbridge, Brubacher, Chan, 2013). In addition to mental distraction, any activity that diverts the driver's eyes or hands from the road for an extended period (e.g., checking messages or browsing music) can potentially cause a traffic accident (Mihai, Dumitru, Postelnicu, Mogan, 2015; Guan, Chen, 2014; Manoharan, Chandrakala, 2015).

Driver skills, such as the ability to concentrate, react quickly to changing road conditions, and make appropriate decisions, are critical for traffic safety. Using mobile phones while driving significantly impacts these skills, limiting the ability to detect hazards, assess situations correctly, and execute proper maneuvers (Malawko, Gorska, 2024; Haberka, Jurecki, 2024).

Talking on the phone in hands-free mode poses similar risks to holding the phone while talking. Distraction is the primary reason for this danger, as drivers using hands-free devices still experience the so-called "inattentional blindness" where they "see" hazards but fail to respond to them or react too late (PAST STATISTICS ON TEXTING & CELL PHONE USE WHILE DRIVING). It has been argued that talking on the phone is no different from conversing with a passenger, but research shows that drivers talking to passengers are at lower risk than those using phones. Scientists hypothesize that conversations with passengers are moderated because both the driver and passengers can see what is happening on the road. Currently, talking on a hands-free phone while driving is not a criminal offense, although the risk remains similar (The scourge of car accidents due to phone use. How much is the fine; Dalibor, Boris, Glavić, 2016).

A 2018 study by the Insurance Institute for Highway Safety (IIHS) found that an increasing number of drivers use mobile phones while driving, engaging in activities such as talking, texting, browsing the internet, entering travel destinations, or selecting music. The IIHS reported that this increases the risk of fatal accidents by approximately 66% and contributed to over 800 deaths on U.S. roads in 2017 (How to Reduce the Risks of Phone Use While Driving). Similarly, a 2018 study by the AAA Road Safety Foundation found that any visual interaction with a phone nearly doubles the risk of an accident and triples the likelihood of veering off the road (IIHS study finds drivers fiddling with cellphones up 57% from last survey; contributing factor in > 800 crash deaths in US; How to Reduce the Risks of Phone Use While Driving).

It is worth noting that supportive systems such as Apple CarPlay and Android Auto reduces the risks associated with phone usage and enhances the overall driving experience. These features mirror familiar phone functions and are displayed on a large infotainment screen in the vehicle. This eliminates the need to use the small phone screen, and the user interface is simplified, with large buttons that are easy to see and use. However, using Apple CarPlay and Android Auto does not

eliminate driver distraction (Hatfield, Murphy, 2007; What Is Android Auto And What Can It Do).

The issue of mobile phone use by drivers emerged in the 1980s and remains a significant concern in the context of road safety (Dragutinovic, Twisk, 2005; Burns, Lansdown, 2000). The modern development of technology has made mobile phones an integral part of daily life, posing new challenges for their use while driving (Elvik, 2012; Stelling, Hagenzieker, 2012). The hypothesis adopted in this study assumes that using a mobile phone while driving significantly increases the risk of road accidents, primarily through driver distraction.

The research methods applied in the analysis included conducting a survey among drivers to determine the frequency and circumstances of phone use while driving. The study also identified psychological and behavioral factors influencing this risky behavior. The survey results showed that over 30% of respondents admitted to using a phone while driving, leading to distractions from the road, reduced caution, and more frequent driving errors.

The contribution of this study to the field lies in providing up-to-date data on the scale of the problem and highlighting the importance of psychological and habitual aspects of mobile phone use by drivers, which have been marginally analyzed in the literature so far. The innovation of this work is expressed in identifying the need to develop new prevention strategies and technologies that effectively limit mobile phone use while driving, which could significantly improve road safety.

Research Methodology

The study on mobile phone use by drivers was conducted using a survey method, enabling the collection of quantitative data on driver behaviors and their perception of risks associated with phone use while driving. The research perspective was based on behavioral theory, which assumes that driver behaviors are shaped by psychological, social, and technological factors. The main objective of the study was to determine the frequency and types of activities performed on mobile phones by drivers, analyze risk perception, and identify compensatory strategies undertaken by drivers to minimize hazards.

The research procedure was conducted from October 15, 2021, to September 1, 2022, at the Department of Automotive Vehicles and Transport at the Kielce University of Technology. A total of 820 respondents voluntarily participated and completed the survey, either in paper form or electronically using a Google form. The questionnaire consisted of 29 questions divided into several thematic sections, covering demographic data such as gender, age, education level, and driving experience; the frequency and types of activities performed on phones while driving;

risk perception associated with this behavior; and compensatory strategies adopted by drivers.

The surveyed group was categorized based on age, place of residence, and level of education. In terms of age, the largest group consisted of respondents aged 18-25, accounting for 42% of the total (342 people). The second-largest group included individuals aged 26-35 (28%, 231 people), followed by those aged 36-45, representing 19% of participants (158 people). Smaller groups included respondents aged 46-60 (7%, 57 people) and the oldest category, those over 60 years old, who comprised 4% of the total (32 people). Regarding place of residence, the largest proportion of respondents lived in rural areas—44% (362 people). Among city dwellers, the highest number resided in towns with up to 50,000 inhabitants (29%, 236 people). In cities with populations between 50,000 and 150,000, 13% of respondents (105 people) were recorded. Those living in cities with 150,000 to 500,000 inhabitants made up 8% (65 people), while the least represented group were residents of large metropolitan areas with over 500,000 inhabitants, accounting for 6% (52 people). When categorized by education level, the majority of respondents held higher education degrees, including bachelor's and advanced degrees 66% (540 people). Respondents with vocational secondary education made up 13% (110 people), the same proportion as those with general secondary education 13% (105 people). Vocational education was reported by 8% of respondents (65 people). Some participants had only primary or middle school education, but their numbers were minimal and not specifically highlighted in the analysis.

The applied methods included the collection of quantitative data using a standardized questionnaire. The research instrument was a survey containing closed and semi-open questions. Closed questions allowed respondents to choose from predefined options, facilitating straightforward coding and statistical analysis. Semi-open questions enabled respondents to add their comments, providing additional qualitative data. Statistical data analysis was performed using basic aggregate statistics, such as calculating means, medians, standard deviations, and percentage shares. Data were presented in tables and charts, providing a detailed depiction of the percentage of drivers using phones while driving, the most common phone-related activities during driving and waiting at traffic lights, differences in driver behavior by gender, and risk perceptions associated with phone use in various traffic situations.

The analysis of the data utilized Microsoft Excel and STATISTICA software, enabling both data aggregation and the creation of statistical visualizations in the form of pie, bar, and line charts.

The study had certain limitations, including the subjectivity of respondents' answers, as participants may not have provided truthful responses, particularly to questions about risky behaviors. Additionally, the sample size of 820 respondents may limit the generalizability of the findings to the entire population. However, the

research procedure provided detailed quantitative data on driver behaviors and their risk perceptions, forming a solid basis for further analyses and the development of practical recommendations aimed at improving road safety.

Road traffic accidents

According to Polish road traffic regulations, the use of a telephone while driving that requires holding a handset or microphone in the hand is prohibited. Therefore, whether checking navigation on a smartphone, using a messaging app, or holding the phone to the ear while talking, the driver may face a fine of 500 PLN and 5 penalty points (Act on Road Traffic of 20 June 1997). According to the United Nations, up to 90% of accidents on the road are caused by the error of the driver who did not notice the danger early enough or started braking too late. Taking your eyes off the road for just 2 seconds doubles the likelihood of an accident, and using a mobile phone can increase this risk by up to 10 times (Not everyone realizes that talking while driving on the phone can be very expensive).

Analyzes of road safety, although they improve every year, do not inspire optimism. Statistically, every 23 minutes there is a road accident in Poland. In addition to the main reasons, such as speed not adjusted to traffic conditions, failure to give way, failure to maintain a safe distance between vehicles or incorrect overtaking, there is also the aforementioned distraction (Road safety; New tariff of fines).

Unfortunately, it should be noted that in Poland, the speed of vehicles is often not adjusted to traffic conditions, and failure to give way to pedestrians may result from driver distraction or engagement in other activities, such as using a mobile phone. Figure 1 presents the number of road accidents on roads with two one-way carriageways, taking into account the main causes of road accidents. It should be noted that failure to adjust speed to road conditions is the cause of an average of 500 road accidents per year. In the analyzed period from 2013 to 2022, the largest number of road accidents on roads with two one-way carriageways due to the maladjustment of speed to road conditions occurred in 2013 (857 road accidents) and the lowest in 2022 (357 road accidents). In the case of failure to give way to a pedestrian on a pedestrian crossing on roads with two one-way carriageways, the largest number of accidents in the analyzed period took place in 2013 (779 road accidents), and the least in 2021 (335 road accidents).

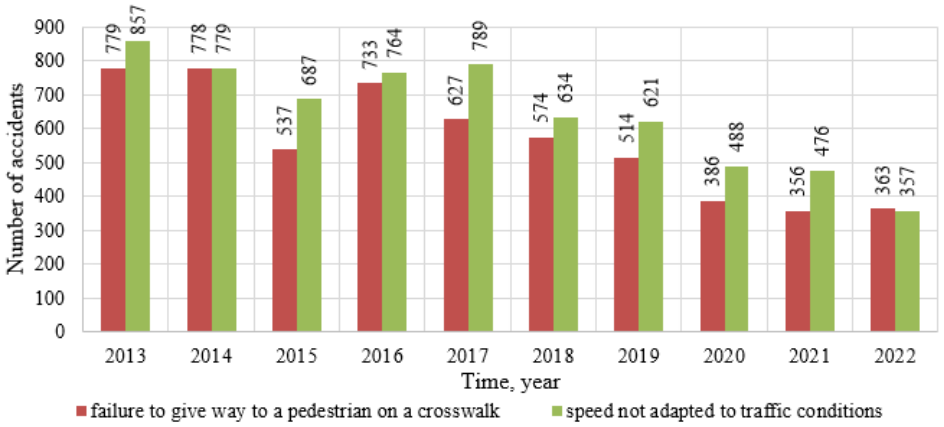

Fig. 1. The main causes of road accidents on roads with two one-way carriageways in the years 2013 – 2022.

Source: author's own elaboration

Figure 2 presents the characteristics of the main causes of road accidents on single-carriageway, two-way roads. The main causes of road accidents on two-way single carriageway roads include: failure to adjust speed to road conditions, failure to give way to pedestrians on the crossing, failure to keep a safe distance between vehicles. It should be noted that the listed causes of accidents may be caused by the use of a mobile phone while driving. In the analyzed period from 2013 to 2022, the number of accidents due to failure to adjust speed to road conditions decreased from 7,125 in 2013 to 3,738 in 2022. The largest number of accidents caused by failure to give way to a pedestrian on a pedestrian crossing took place in 2016 and amounted to 2,360 road accidents. The fewest accidents caused by this cause were recorded in 2021 (1,612 road accidents). In addition, it should be noted that in the analyzed time period, on average, 1,504 road accidents are caused by failure to maintain the appropriate distance from the vehicle.

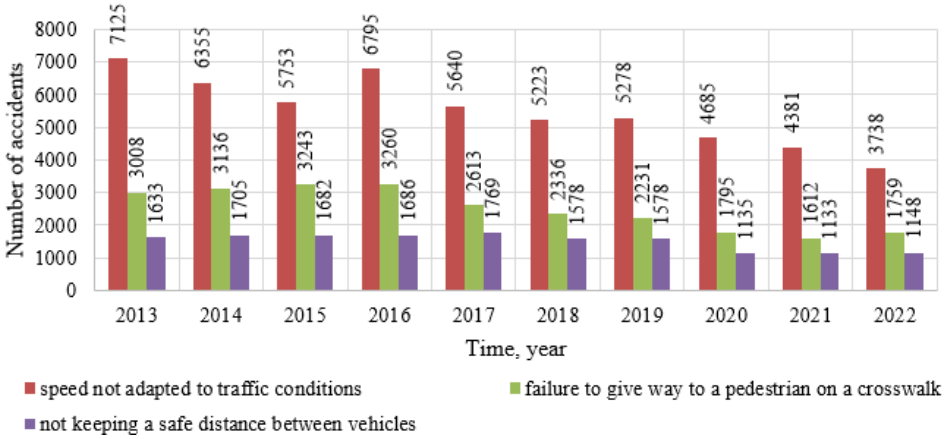

Fig. 2. The main causes of road accidents on single-carriageway two-way roads in the years 2013 – 2022.

Source: author's own elaboration

Survey research

The study involved 820 respondents, including 451 women and 369 men. The research was conducted using a survey technique, which proved to be an effective tool for exploring the behaviors of participants. Participation in the survey was voluntary, and respondents gave their consent before completing the questionnaire, which consisted of 29 questions. The surveys were available both in paper format and electronically via Google Forms.

One of the key questions asked respondents to indicate whether they considered using a mobile phone while driving dangerous. The responses are presented in Figure 3. The results show that 48.12% of women (217 respondents) strongly believe that using a phone while driving is dangerous, compared to 36.31% of men (134 respondents). Additionally, 25.50% of women (115 respondents) and 29.27% of men (108 respondents) believe that phone use is "probably" dangerous. On the other hand, 12.20% of women (55 respondents) and 11.92% of men (44 respondents) consider using a phone while driving to be "rather" safe. Mobile phone use was deemed completely safe by 8.87% of women (40 respondents) and 12.20% of men (45 respondents). The response "hard to say" was chosen by 5.32% of women (24 respondents) and 10.90% of men (40 respondents).

The analysis of the results highlights significant differences between women and men in their perception of the safety of using a mobile phone while driving. Women are more likely than men to believe that using a phone is dangerous (48.12% of women versus 36.31% of men). At the same time, men are more likely to indicate ambiguity in risk assessment (10.90% of men selected "hard to say" compared to 5.32% of women). Furthermore, men are more likely to consider phone use while driving as safe (12.20% of men versus 8.87% of women). This may indicate a greater acceptance of this risky behavior among men, which could be linked to gender differences in attitudes toward risk.

It should be noted that in Poland, more than 22 million people hold a driver's license. Women account for approximately 40% of all drivers, meaning that around 9 million Polish women have the right to drive. Men make up the remaining 60%, which translates to about 13 million drivers. These statistics indicate that while the number of women holding a driver's license is steadily increasing, men still dominate in the overall figures related to driving qualifications (CEPIK).

The findings underscore the need for educational initiatives targeting both women and men, while taking into account the specific ways each gender perceives risk. In particular, efforts should focus on raising awareness among men, who are more likely to consider phone use while driving as safe or are unable to clearly assess the associated risks. Such campaigns could help reduce dangerous behaviors and improve road safety.

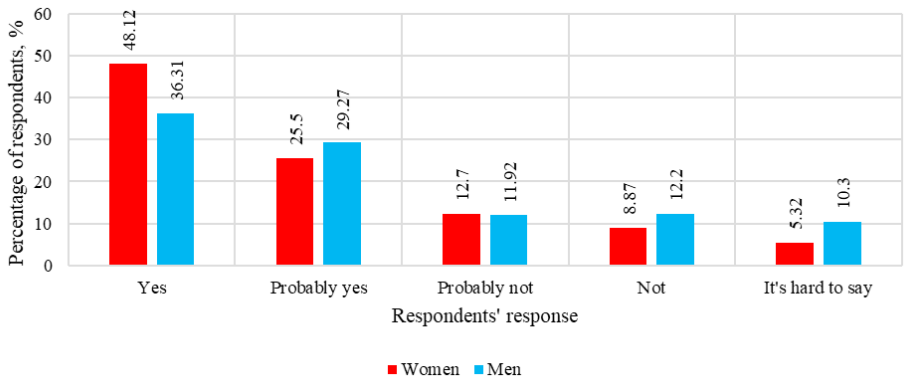

Fig. 3. Is it safe to use a mobile phone while driving?
Source: author's own elaboration

Respondents were then asked whether they use a mobile phone while driving. It is important to note that the study included only individuals with a valid driver's license. The responses to this question are presented in Figure 4. The study results

show that 32.15% of women (145 respondents) and 29.81% of men (110 respondents) openly admitted to using a mobile phone while driving. Additionally, 30.38% of women (137 respondents) and 35.77% of men (132 respondents) indicated that they "probably" use a phone while driving. This means that a total of 62.53% of women respondents and 65.58% of men respondents either use or probably use a phone while driving.

On the other hand, only 16.63% of women (75 respondents) and 7.05% of men (26 respondents) declared that they do not use a mobile phone while driving. Moreover, 19.51% of women (88 respondents) and 17.34% of men (64 respondents) indicated that they "probably" do not use a phone. It is noteworthy that nearly twice as many women use a phone while driving as those who claim not to. Among men, the number of those who use a phone is nearly three times greater than those who declared they do not. An interesting observation is the percentage of respondents who chose the answer "Hard to say." Among men, this accounts for 10.03% (37 respondents), indicating greater uncertainty or lack of reflection on their behavior compared to women, where only 1.33% (6 respondents) selected this response.

The results demonstrate that using a phone while driving is a common phenomenon, particularly among men, where 65.58% admitted to this behavior either directly or indirectly. Women also frequently use phones while driving, although they are more likely than men to declare they do not (16.63% of women versus 7.05% of men). There are also clear differences in the level of uncertainty, which is higher among men.

The study highlights the need for educational initiatives aimed at raising awareness of the risks associated with using a phone while driving. Campaigns should target both genders, but with consideration of the specific differences in how this behavior is perceived. Particular emphasis should be placed on men, who are more likely to use a phone while driving and exhibit greater uncertainty in evaluating their habits.

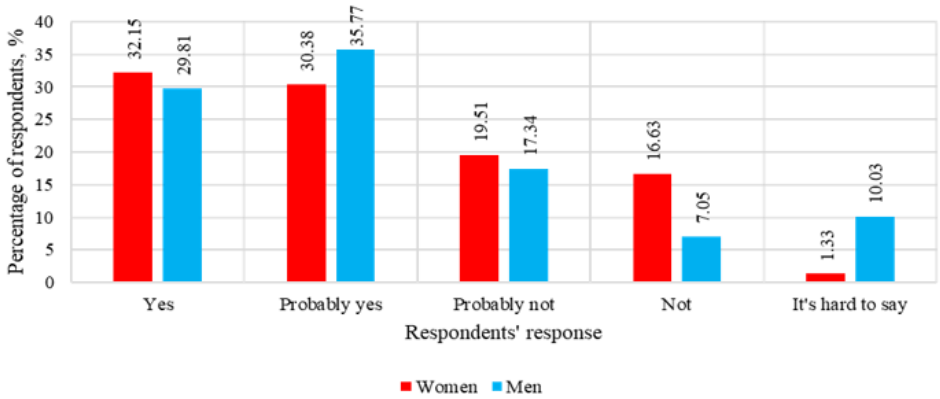

Fig. 4. Do you use a mobile phone while driving?
Source: author's own elaboration

In the next question, respondents were asked to indicate the frequency of mobile phone use while driving. The responses to this question are presented in Figure 5. The results show that the highest percentage of both women and men stated they use their phone "Occasionally." This response was selected by 36.59% of women (165 individuals) and 33.33% of men (123 individuals). The second most common response was "Sometimes," chosen by 29.93% of women (135 individuals) and 31.44% of men (116 individuals). The response "Always" was selected by 14.41% of women (65 individuals) and 15.99% of men (59 individuals), indicating a slightly higher percentage of men who use their phone during every drive. Meanwhile, 10.24% of women (46 individuals) and 10.84% of men (40 individuals) declared they use their phone "From time to time," reflecting similar behaviors in this category.

The largest difference was observed in the „Never" category. A total of 16.80% of men (62 individuals) declared they never use their phone while driving, compared to only 8.65% of women (39 individuals). This indicates that men are almost twice as likely as women to report not using their phone at all while driving.

The analysis of the results suggests that the frequency of phone use while driving varies between women and men. A higher percentage of women than men reported using their phone „Occasionally" or „Sometimes," whereas men were more likely to choose the „Never" option. At the same time, the higher percentage of men declaring no phone use contrasts with their slightly higher percentage of individuals who reported using their phone „Always." These findings may reflect differences in risk attitudes and habits related to phone use while driving.

These data emphasize the need for educational initiatives aimed at reducing phone use while driving, especially among those who use it regularly, as indicated by the „Always" and „Sometimes" responses. Particular attention should be given

to women, who are less likely to declare never using their phone while driving, potentially indicating greater acceptance of this behavior. Awareness campaigns should also account for differences in habits and attitudes between genders to more effectively reach both groups and promote safe driving behaviors.

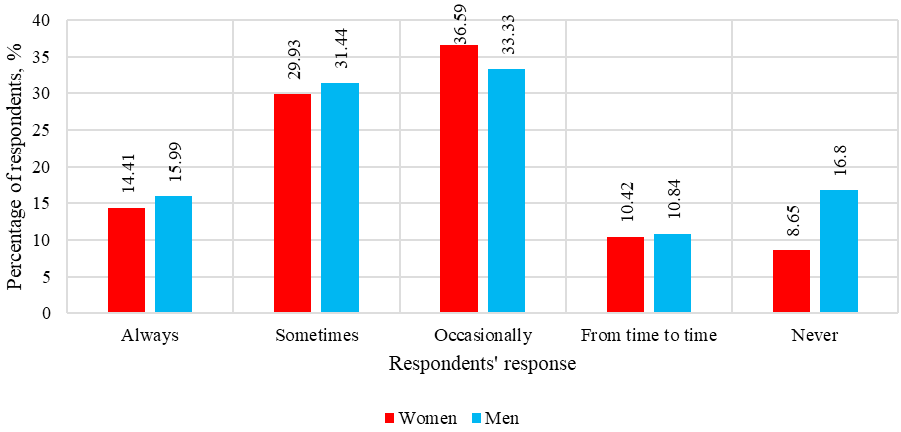

Fig. 5. How often do you use your mobile phone while driving
Source: author's own elaboration

Respondents were asked about the activities they perform on their mobile phones while driving. The responses to this question are presented in Figure 6. The results show that the most common activity is using the phone as a GPS navigation device. This response was selected by 75.39% of women (340 individuals) and 84.01% of men (310 individuals). The second most common activity is making phone calls, reported by 89.80% of women (405 individuals) and 71.27% of men (263 individuals). Listening to music while driving was indicated by 39.69% of women (179 individuals) and 39.57% of men (146 individuals), showing nearly identical percentages in this category. Writing SMS or text messages while driving was declared by 40.58% of women (183 individuals) and 20.05% of men (74 individuals). In this category, the percentage of women is more than twice that of men, indicating a greater tendency among women to engage in this activity while driving.

Additionally, 39.69% of women (179 individuals) and 39.57% of men (146 individuals) use other applications on their phones while driving. For less common activities, such as video calls, only 6.23% of women (28 individuals) and 17.29% of men (64 individuals) reported engaging in such activities. Recording videos was declared by 12.20% of women (55 individuals) and 11.92% of men (44 individuals), while taking photos was reported by 16.41% of women (74 individuals) and 11.10% of men (41 individuals). The response "I do not use my phone while driving" was

selected by 5.32% of women (24 individuals) and 20.87% of men (77 individuals), indicating that men are more than four times as likely as women to declare no phone use while driving.

The results indicate that both women and men most frequently use their phones for GPS navigation and making phone calls. However, women are more likely than men to report writing SMS or text messages, which may indicate a higher risk of distraction in this group. On the other hand, men are more likely than women to engage in video calls while driving. Notably, the percentage of men declaring no phone use while driving is significantly higher than among women. This may reflect greater awareness of the dangers or a different approach to phone use while driving.

The study highlights that mobile phone use while driving is widespread and includes various activities that can significantly distract drivers. Special attention should be given to women, who are more likely than men to engage in highly distracting activities such as texting. Educational campaigns and preventive measures should consider these behavioral differences to more effectively reduce risky phone use while driving.

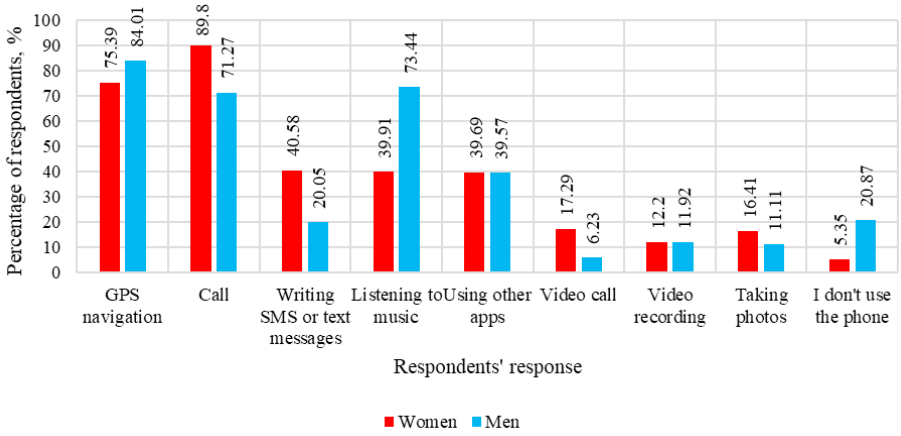

Fig. 6. What you do most often on your mobile phone while driving
Source: author's own elaboration

In the next question, respondents were asked whether they believe using a mobile phone while waiting for a traffic light to change is dangerous. The responses to this question are presented in Figure 7. The results show that 25.94% of women (117 individuals) and 28.46% of men (105 individuals) consider using a phone in this situation dangerous. Additionally, 21.06% of women (95 individuals) and 15.99% of men (59 individuals) believe such behavior is "probably" dangerous. Conversely, 28.38% of women (128 individuals) and 31.81% of men (117 individuals) think that

using a phone in this situation is "probably" safe. Meanwhile, 23.28% of women (105 individuals) and 15.99% of men (59 individuals) state that using a phone while waiting for a light to change is definitely safe. The response "Hard to say" was selected by 1.33% of women (6 individuals) and 7.86% of men (29 individuals), indicating a higher level of uncertainty among men.

The results indicate that more men than women perceive using a phone while waiting for a light to change as safe (a total of 47.80% of men vs. 51.66% of women, combining the responses "probably safe" and "definitely safe"). At the same time, a higher percentage of women than men believe such behavior is dangerous or probably dangerous (a total of 47.00% of women vs. 44.45% of men). The higher percentage of men expressing uncertainty ("Hard to say") may suggest lower awareness or less reflection on the potential risks of using a phone while waiting for a light to change.

The study results show that opinions on the safety of using a mobile phone while waiting for a traffic light to change are divided. More men than women consider such behavior safe, while women are more likely to perceive potential danger. This highlights the need to raise awareness among drivers of both genders about the impact of even short-term phone use on concentration and road safety. Educational campaigns should address these differences in risk perception to more effectively promote safe driving behaviors.

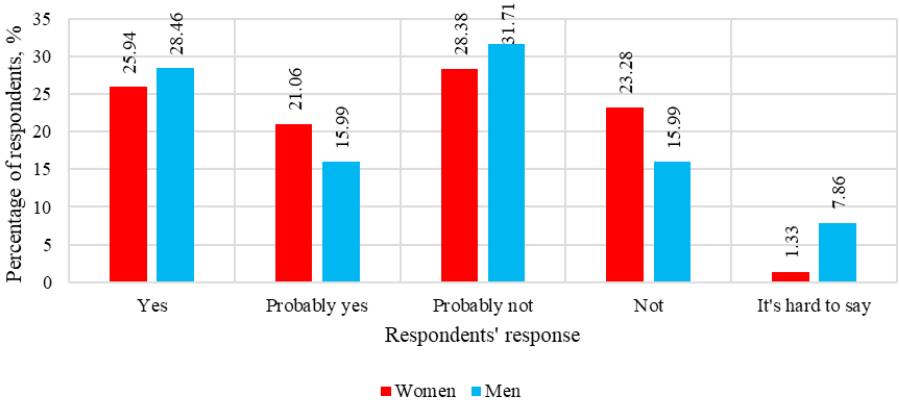

Fig. 7. Do you think it is safe for the driver to use a mobile phone while waiting for a traffic light to change?

Source: author's own elaboration

In the next question, respondents were asked whether they use their mobile phone while waiting for traffic lights to change. The responses to this question are presented in Figure 8. The results show that 52.11% of women (235 individuals) and 28.73% of men (106 individuals) reported using their phone while waiting for the

lights to change. Additionally, 38.80% of women (175 individuals) and 42.01% of men (155 individuals) stated that they "probably" use their phone in this situation. Conversely, 5.10% of women (23 individuals) and 24.12% of men (89 individuals) declared that they "probably do not" use their phone while waiting for the lights to change. Only 2.66% of women (12 individuals) and 3.52% of men (13 individuals) indicated that they definitely do not use their phone in this situation. The response "Hard to say" was selected by 1.33% of women (6 individuals) and 1.63% of men (6 individuals), indicating a similar level of uncertainty in both groups.

The results show that women are significantly more likely than men to report using their phone while waiting for traffic lights to change (52.11% vs. 28.73%). However, men are more likely than women to indicate that they „probably do not" use their phone (24.12% vs. 5.10%) or definitely do not use it (3.52% vs. 2.66%). It is worth noting that the percentage of individuals who report „probably" using their phone while waiting for traffic lights is relatively high in both groups, which may reflect a lack of clear conviction about the safety or risk associated with such behavior.

The study reveals that using a phone while waiting for traffic lights to change is more common among women than men. These differences may stem from variations in habits, risk perception, or the view of this activity as relatively harmless. The findings highlight the need for educational efforts and informational campaigns to raise awareness of the potential risks associated with using a phone while driving, even in situations that may seem less demanding for drivers, such as waiting for traffic lights to change.

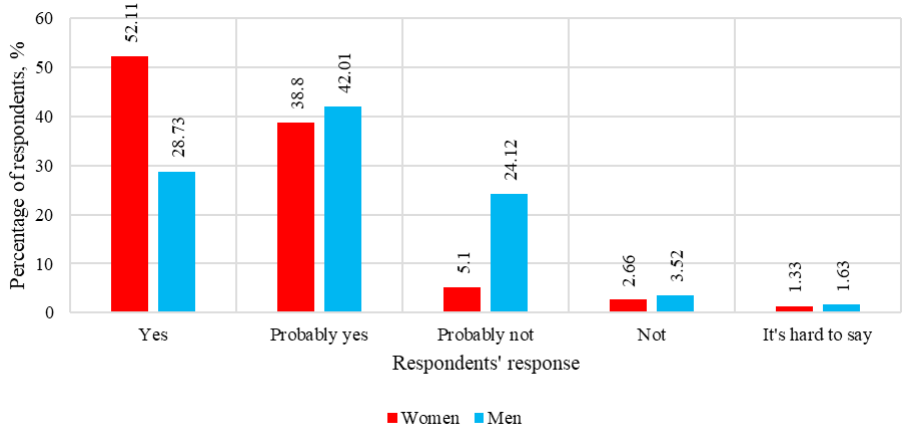

Fig. 8. Do you use your mobile phone while waiting for the traffic lights to change?
Source: author's own elaboration

Respondents were asked how often they use their mobile phones while waiting for traffic lights to change. The responses to this question are presented in Figure 9. The results show that 14.41% of women (65 individuals) and 15.99% of men (59 individuals) always use their phone while waiting for traffic lights to change. Frequent phone use in this situation was reported by 29.93% of women (135 individuals) and 31.44% of men (116 individuals). Occasional phone use while waiting for traffic lights was declared by 36.59% of women (165 individuals) and 33.33% of men (123 individuals). Meanwhile, 10.42% of women (47 individuals) and 10.84% of men (40 individuals) stated they use their phone "from time to time." The response "Never" was selected by 8.65% of women (39 individuals) and 16.80% of men (62 individuals), indicating that men are nearly twice as likely as women to declare they never use their phone in this situation.

The results show that most respondents, both women and men, use their phone while waiting for traffic lights, although the frequency of this behavior varies. Women are more likely to report occasional phone use („Occasionally"), while men are slightly more likely to indicate regular use („Always" and „Frequently"). At the same time, men are significantly more likely than women to declare they never use their phone in this situation, which may reflect greater risk awareness or differences in how this activity is perceived.

Using a phone while waiting for traffic lights is a common behavior among both women and men, though differences in the reported frequency are noticeable. These results highlight the need for educational initiatives to raise awareness among drivers that even during short stops, phone use can affect their concentration and reaction times. Special attention should be given to those who always use their phone in this situation to reduce potential risks on the road.

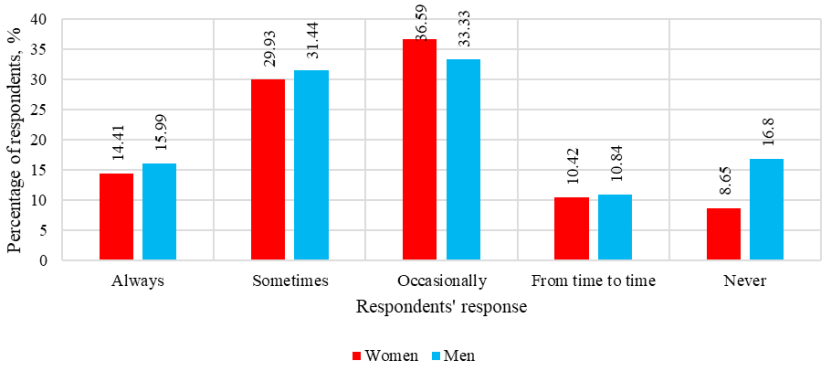

Fig. 9. How often you use your phone while waiting for traffic lights to change
Source: author's own elaboration

In the next question, respondents were asked about the activities they most frequently perform on their phone while waiting for traffic lights to change. The responses to this question are presented in Figure 10. The results show that 19.73% of women (89 individuals) and 32.79% of men (121 individuals) use GPS navigation while waiting. The most common activity reported by women was calling family or friends, which was declared by 75.61% of women (341 individuals) compared to 30.35% of men (112 individuals). Text messaging was indicated by 19.73% of women (89 individuals) and 18.70% of men (69 individuals), showing a similar percentage in both groups. Browsing social media while waiting was reported by 41.91% of women (189 individuals) and 48.78% of men (180 individuals). Listening to music was declared by 14.19% of women (64 individuals) and 31.44% of men (116 individuals). Additionally, 22.84% of women (103 individuals) and 42.28% of men (156 individuals) reported using other apps. Managing banking apps while waiting was declared by 19.73% of women (89 individuals) and 21.14% of men (78 individuals). Browsing news was more common among women, reported by 46.34% of women (211 individuals) compared to 31.98% of men (118 individuals). Taking photos or recording videos was reported by 14.41% of women (65 individuals) and 9.21% of men (34 individuals). Checking email was reported by 23.95% of women (109 individuals) and 46.07% of men (170 individuals).

The results reveal clear differences in the preferences and habits of phone use while waiting for traffic lights between women and men. Women are significantly more likely than men to call family or friends (75.61% vs. 30.35%) and browse news (46.34% vs. 31.98%). Men are more likely than women to use their phone for checking email (46.07% vs. 23.95%), listening to music (31.44% vs. 14.19%), and using other apps (42.28% vs. 22.84%).

The findings indicate that women tend to engage more in interpersonal communication (calling, browsing news), while men more often utilize their phone for functional purposes such as navigation, apps, or email. These differences may reflect varying priorities and needs related to phone use. Educational efforts should consider these differences to more effectively promote safe driving behaviors and reduce phone use while driving, even during stops at traffic lights.

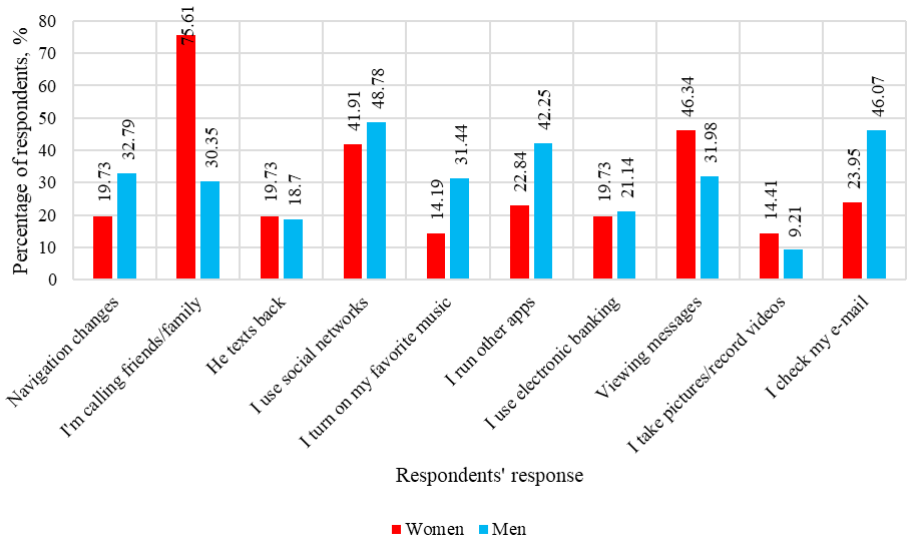

Fig. 10. What you do on your mobile phone while waiting for the traffic lights to change
Source: author's own elaboration

The study conducted among drivers revealed significant differences in the use of mobile phones while driving and waiting for traffic lights to change. The analysis of responses indicates that mobile device usage is widespread, which may lead to distraction and an increased risk of road accidents.

While driving, 62.53% of women and 65.58% of men reported using their phones regularly or occasionally. The most common activities included using GPS navigation, making phone calls, and browsing social media. Women were more likely than men to engage in texting (40.58% vs. 20.05%), which can significantly distract attention. Meanwhile, men more often declared never using their phone while driving (16.80% vs. 8.65%).

While waiting for traffic lights to change, phone use was equally frequent. A total of 52.11% of women and 28.73% of men admitted to always using their phones in this situation, while an additional 38.80% of women and 42.01% of men indicated that they "probably" use their phones. Women most often used this time to make phone calls (75.61% vs. 30.35%) and browse news (46.34% vs. 31.98%), while men more frequently used apps such as GPS navigation (32.79% vs. 19.73%) or checked emails (46.07% vs. 23.95%).

Perceptions of the safety of phone use also varied between genders. A total of 25.94% of women and 28.46% of men considered using a phone while waiting for traffic lights dangerous, while an additional 21.06% of women and 15.99% of

men thought it was "probably dangerous." At the same time, men more frequently believed such behavior to be safe (47.80% of men vs. 51.66% of women, combining responses "probably safe" and "safe").

The results of the study highlight several key conclusions. First, using a phone while driving and during stationary situations is common, particularly among women, who more frequently engage in interpersonal communication such as phone calls or browsing news. Men, on the other hand, use their phones more often for functional purposes such as navigation or app use.

Second, activities performed on phones, such as texting, browsing social media, or using apps, can lead to distraction and increased risk on the road. Third, differences in perceptions of the safety of phone use point to the need for educational efforts to raise awareness about the risks of this behavior. These campaigns should be tailored to the differences in habits and perceptions of risk between women and men.

The study clearly demonstrates that mobile phone use is widespread both while driving and while waiting for traffic lights. There is an urgent need to raise drivers' awareness of the risks associated with this behavior and to implement preventive measures to reduce risky actions and improve road safety.

The chi-square test analysis for questions regarding mobile phone use in the context of driving and waiting for traffic lights revealed significant differences between the responses of women and men. The chi-square test helped determine whether gender has a statistically significant impact on declared behaviors and perceptions of safety in the situations examined.

For the question concerning mobile phone use while driving ($Chi2 = 47.08$, $p < 0.001$), the results indicate a strong dependence between gender and declared behaviors. Women more frequently reported using their phones in this situation, whereas men more often stated that they do not use their phones or had difficulty specifying their behavior. This result may suggest differences in habits and attitudes toward phone use while driving.

In the question regarding the perception of safety when using a phone while driving ($Chi2 = 16.49$, $p < 0.01$), significant differences were also observed. Women were more likely to consider this behavior dangerous or "probably dangerous," while men more often indicated it was "probably safe" or "safe." This may suggest that women are more aware of the potential risks associated with using a phone while driving.

The strongest relationships were observed in the question about phone use while waiting for traffic lights to change ($Chi2 = 81.56$, $p < 0.001$). Women were significantly more likely to report using their phone in this situation, while men more often stated they "probably do not" or "do not" use their phone. These differences may be related to differing priorities in phone use, such as interpersonal communication for women and greater reluctance among men toward such behaviors.

In the question regarding the perception of safety when using a phone while waiting for traffic lights (Chi2 = 29.67, $p < 0.001$), women more frequently indicated that this behavior is dangerous, while men more often considered it "probably safe" or "safe." This result highlights gender differences in risk perception even in this scenario.

The analysis indicates that gender significantly influences phone use behaviors and the perception of safety in various traffic situations. Women are more likely to report phone use while simultaneously exhibiting greater risk awareness. Men use phones less frequently but are more likely to consider this behavior safe. The most pronounced differences were observed in situations involving waiting for traffic lights, where women are much more likely to use their phone, and men more often avoid such behaviors.

The results of this analysis can serve as a basis for designing preventive and educational initiatives targeted at drivers. Information campaigns should account for gender differences in behaviors and risk perception. Women, who use their phones more often, should be educated about practical ways to reduce this habit. Men, although less frequent users, may need greater awareness of potential risks to reduce the dangers associated with misperceived safety. Special emphasis should be placed on situations involving waiting for traffic lights, which present the most problematic differences in declared behaviors between women and men.

Thus, the analysis highlights the necessity of implementing measures to reduce phone use among drivers, considering the specific behaviors of women and men and their differing perceptions of risk.

Discussion of results

The results of the conducted study indicate a significant impact of mobile phone use on road traffic safety, which aligns with findings in scientific literature. The article (McCartt, Hellinga, Bratiman, 2006) highlights that using mobile phones, whether handheld or hands-free, significantly reduces driver performance and increases the risk of accidents by up to four times. Although regulations prohibiting handheld phone use exist, their effectiveness is limited, and the issue continues to grow.

Our research confirms these conclusions. We found that 62.53% of women and 65.58% of men reported using their phones while driving, indicating the prevalence of this behavior. Additionally, women reported phone use more often than men, which may stem from differences in communication habits.

The article (Lipovac, Đerić, Tešić, Andrić, Marić, 2017) emphasizes that hands-free phones are no safer than handheld phones. Results indicate that both modes of use significantly increase the risk of accidents, particularly among young men.

Our findings showed that men are more likely than women to use utility apps such as GPS, which can be as dangerous as traditional phone calls. Among men, 84.01% indicated using GPS while driving, demonstrating their greater reliance on utility technologies.

The article (Kashevnik, Shchedrin, Kaiser, Stocker, 2021) underscores the importance of driver distraction, which can be manual, visual, or cognitive, as well as the need to develop systems to monitor these phenomena. Current systems are deemed insufficient, especially in the context of increasing vehicle automation.

In our research, 45% of women and 48.78% of men reported using social media while waiting for traffic lights. This is an example of cognitive distraction, which can delay reactions to changing road conditions. These findings suggest the need for advanced systems to monitor driver distraction.

The article (Ortega, Mariscal, Boulagouas, Herrera, Espinosa, García-Herrero, 2021) found that young drivers performing tasks such as using WhatsApp or Instagram exhibited significant problems with vehicle control. These results point to the need for targeted educational efforts for younger age groups.

Our findings also suggest that younger drivers may be particularly vulnerable to the negative effects of phone use. Respondents in our study indicated that texting and using apps are among the most common activities performed while driving. Furthermore, women were more likely than men to report such behaviors, emphasizing the necessity of targeting educational efforts toward this group as well.

The articles (Frej, 2024) and (Frej, Jaśkiewicz, Poliak, Zwierzewicz, 2022) highlight the less-studied issue of phone use by pedestrians. Research shows that 22% to 37% of pedestrians use their phones while crossing streets, increasing the risk of road accidents. Observations indicate that phone use slows pedestrian movement, reduces alertness, and increases the likelihood of ignoring traffic signals.

Our research confirms these observations in the context of drivers. While waiting for traffic lights, 52.11% of women and 28.73% of men reported using their phones. Moreover, phone use during such stops is often perceived as less risky, possibly due to a lack of awareness about potential hazards.

The results of our study align closely with scientific literature, confirming the prevalence of mobile phone use by both drivers and pedestrians and its negative impact on road traffic safety. Differences between women and men in terms of reported behaviors and risk perception are particularly significant. Women use phones more frequently but are more aware of the associated risks. Men, on the other hand, report using phones less often but are more likely to perceive this behavior as safe.

Conclusions

Distraction of road users, particularly drivers, remains one of the most significant challenges to road traffic safety. The aim of the study was to determine the frequency and circumstances of mobile phone use while driving and to verify the hypothesis that using a phone while driving significantly increases the risk of road accidents.

The conducted research confirms the hypothesis. It was shown that over 30% of respondents regularly use a mobile phone while driving, leading to distraction and an increased risk of accidents. The most common activities include receiving and making phone calls, using GPS navigation, and texting. Another notable finding is the widespread use of phones while waiting for traffic lights to change. In such situations, respondents, in addition to basic phone functions, also use additional applications such as email, banking apps, and social media, which further increase the level of distraction.

The results indicate that the prohibition of mobile phone use while driving in many countries, although significant, is insufficient. Driver distraction occurs both with handheld phones and hands-free systems. The problem is exacerbated by the fact that enforcing these regulations is difficult, and detecting phone use at the time of an accident is often impossible.

The research also highlights the psychological and behavioral aspects of mobile phone use, which play a key role in understanding driver motivation. Women are more likely than men to use phones while driving, but they exhibit greater awareness of the associated risks. Men, on the other hand, are more likely to declare that they do not use phones, though they also tend to underestimate the risks associated with this behavior.

The survey results provide up-to-date data on the scale of the problem and highlight the need for new prevention strategies that address both technological and educational aspects. In the context of increasing vehicle automation, special attention should be given to developing systems that monitor driver concentration levels and detect instances of mobile phone use while driving.

Thus, the study underscores the necessity of raising public awareness about the dangers of mobile phone use while driving. It also points to the need for stricter regulations and technological solutions that can help reduce the use of electronic devices while driving. In the long term, these measures could significantly improve road traffic safety.

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