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Analyzing the Influence of Mobile Phone Distraction on Driving Behavior

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ABSTRACT

Mobile phone distraction has emerged as a major social and road safety issue, contributing to rising rates of traffic accidents, injuries, and fatalities. Understanding how phone use influences driver behavior is therefore essential. This study investigates drivers' attitudes and behaviors regarding mobile phone use while driving through a questionnaire survey of 613 participants across multiple regions of Anbar Governorate, Iraq. Results reveal that 68% of drivers admit to using their phones while driving, most frequently on urban roads. Notably, 51.4% reported never switching their phones to silent mode, despite having access to modern vehicles and higher education. Logistic regression analysis identified behavioral factors—particularly responding to calls while driving ($p < 0.001$) and a history of phone-related accidents ($p < 0.001$)—as significant predictors of phone use, whereas demographic factors showed no significant association. These findings highlight the prevalence of risky driving behaviors linked to mobile phone distraction and underscore the need for targeted interventions to enhance road safety.

Keywords: Mobile phone distraction, Driving behavior, Road safety, Traffic accidents.

INTRODUCTION

Over the past few years, mobile phone ownership has increased dramatically worldwide, which resulted in a rise in the use of these devices in vehicles. The usage of cell phones while driving is an important concern for legislators. There is proof that the enormous rise in mobile phone use in societies is causing this behavior to spread rapidly. However, despite global evidence on the dangers of distracted driving, little is known about the prevalence and determinants of this behavior in Anbar Governorate, Iraq. Addressing this gap is essential to provide locally relevant insights that can guide policymakers and road safety interventions. Over the last five to ten years, the rate of drivers using mobile phones while driving has increased from 1% to 11%, according to research conducted in a number of countries. Hand-free phone use is also probably on the rise (Ortega et al., 2021). The frequent use of mobile phones by drivers while driving has recently raised safety concerns and attracted considerable research attention (Al-Ajlouny & Alzboon, 2023). Traffic accidents represent a complicated phenomenon caused by a number of variables, including the state of roads, the conduct of drivers, the features of the vehicle, and the surroundings (Al-Masaeid, 2009). Road safety can be adversely affected by any activity that diverts attention or competes for a driver's attention while driving. Distracted driving is believed to be a contributing factor in more than a half of distraction-related collisions and is thought to be the most common type of inattention

(Line, 2002; Stutts et al., 2001; Wang et al., 1996).

Distracted driving is defined as "the diversion of attention from safe driving activities to a competing activity" (Kashevnik et al., 2021). This happens when "an event, activity, object, or person inside or outside the vehicle forces or induces the driver to divert attention away from the driving task, causing a delay in perceiving essential information to perform the driving task safely" (Stutts et al., 2001). Distractions can be in several ways: visual (like staring at a mobile phone screen), aural (like playing loud music), or tactile (like pressing a number on the phone) and intellectual, including conversing (Kashevnik et al., 2021). Cell phone use while driving a motor vehicle is one of the most significant and hazardous issues, since it causes the driver to get distracted and delay processing visual information (Ishida & Matsuura, 2001). Although attempts to limit this activity through regulation have not been very successful, governments at all levels have recently recognized the problem of drivers using mobile phones while driving. According to the Iraqi Central Statistical Organization (CSO) website, the number of mobile phones per 100 individuals increased from 90.6 in 2015 to 98.8 in 2021 CSO, 2023a). In addition, Iraq has witnessed a significant increase in the number of cars since 2003, coinciding with the widespread use of mobile phones. Further, the overall number of collision injuries caused by mobile phone use while driving increased from roughly 120 in 2020 to 275 in 2022 across all Iraqi governorates (CSO, 2021a; 2023b).

Finally, in addition to the aforementioned statistics, it is recognized that information regarding mobile phone use forms of distracted driving is crucial to gather, as it is not routinely gathered in many countries (WHO, 2011). This is also true in Iraq, where the WHO safety study states that there is no relevant information about using a phone while operating a motor vehicle (WHO, 2018). In light of this, the primary objective of this research was to analyze relevant information associated with drivers and explore the correlation between mobile phone usage while driving and dangers on highways, particularly focusing on the frequency of actual traffic accidents and near-collision incidents.

LITERATURE REVIEW

Mobile phone use while driving has become a prominent issue in traffic safety research, given its proven impact on the likelihood of accidents. Redelmeier and Tibshirani (1997) in Canada conducted one of the first large-scale epidemiological studies to address this issue using analysis of accident-related call logs. Their results showed that the risk of being involved in a traffic accident while talking on the phone increased four-fold. However, subsequent criticisms were raised regarding the methodological design, as the comparison periods included times when participants were less likely to be driving, potentially under-estimating the actual risk (Redelmeier & Tibshirani, 1997).

Recent research has sought to determine and analyse the factors that may increase the likelihood of using a cell phone while driving, as well as the ways in which this practice may reduce road safety by increasing the probability of collisions or impairing the ability to safely drive(Asad & Hadi, 2024). The conceptual framework for most of these studies is shown in Figure 1.

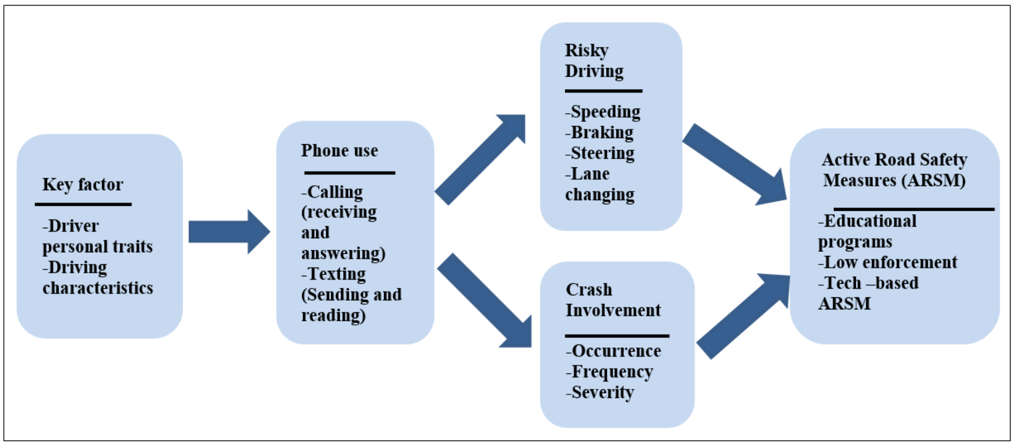

Figure 1. The typical conceptual framework used by researchers in the majority of studies addressing the negative effects of using a mobile phone while driving

In this context, several studies have relied on more precise tools, including field questionnaires and personal interviews, to expand their understanding of different phone use patterns. For example, according to an Australian survey, Oviedo-Trespalacios et al. (2017) revealed that 49% of drivers talked on their phones while driving, and 50% texted or surfed the internet. Despite this, 94% acknowledged the risks of texting and 72% acknowledged the risks of making calls. However, drivers exhibited evasive behaviors to avoid punishment, such as hiding their phones or monitoring the road for police surveillance (Oviedo-Trespalacios et al., 2017). Among young drivers, the prevalence of mobile phone use is particularly alarming. Survey data indicates that a high percentage of university students occasionally talk on the phone while driving. Moreover, observational analyses showed that distracted driving is present in a notable share of traffic incidents, suggesting a strong link between inattention and collision likelihood (Seo & Torabi, 2004).

Meta-analyses provided robust evidence supporting the claim that both hand-held as well as hand-free mobile phone use significantly impairs driving performance. Such use is associated with a fourfold increase in crash risk and a 40% delay in driver reaction times. These results highlight how mobile communication can generate cognitive distraction, whether or not the device is carried in the hand (Caird et al., 2018; White et al., 2004). Furthermore, research into the psychological factors influencing this behavior has shown that being aware of possible dangers does not always translate into safer driving habits. Responsible behavior is more strongly predicted by drivers' favorable opinions toward road safety. As a result, rather than concentrating only on increasing awareness, successful interventions should also emphasize changing attitudes and behaviors (Montuori et al., 2021). In the Middle East, according to a survey of 423 drivers in Jordan, 93.1% of them, mostly young male college students, used cell phones while driving even though they were aware of the dangers and the law. Furthermore, the study found that factors like age, gender, education, driving experience, and daily distance driven were strongly correlated with phone use (Ismeik et al., 2015).

The behavior of 602 drivers involved in accidents in Qatar was examined by Bener et al. (2010) in the same context. According to the findings, 73.2% of them used a cell phone during the collision, and 82.6% utilized hand-held devices without any accessories. This indicates that even among drivers who are genuinely involved in accidents, unsafe behaviors are very common (Bener et al., 2006). Recent statistical analyses using logistic regression models have further confirmed that frequent mobile phone use—especially when answering calls or using hand-held devices—is significantly associated with higher crash involvement. This is particularly evident among young male drivers with higher education levels and risky driving habits. Conversely, drivers who slow down or stop their vehicle while using a phone exhibit a lower likelihood of near-collision incidents, demonstrating the importance of adaptive behavior (Asad & Hadi, 2024). Experimental studies have reinforced these findings by showing that mobile phone-related tasks significantly impair reaction times. Texting was found to be the most distracting activity, followed by reading messages, making hand-held calls, and finally, using hand-free devices. Importantly, no significant difference was observed in cognitive distraction between hand-held and hand-free communication, indicating that both forms equally compromise driver attention (Mutar et al., 2021).

The literature review shows that various methods have been used to explore how mobile phone use affects driving. These include simulator-based experiments, accident record analyses, observational studies, and survey-based approaches. Each of these methods has offered valuable insights; however, the findings haven't always lined up consistently, especially when it comes to the connection between drivers' awareness of risks and their actual practices. Additionally, numerous current studies based on surveys have taken place in contexts beyond Iraq, which makes it challenging to fully grasp how cultural, social, and regulatory factors affect distracted driving behaviours in this particular setting. This study takes a friendly approach by using a survey design to build on previous research and provide unique evidence to assist in filling this gap in the literature.

METHODOLOGY

Data Collection

A pilot study was initially performed with a sample of drivers to evaluate the clarity and efficacy of the questionnaire. Revisions were implemented to enhance the phrasing of questions and the selection of response possibilities, based on their comments. The definitive version of the questionnaire was disseminated online through social media platforms to a representative sample of Anbar Governorate. To achieve wider coverage, personal interviews were conducted, and printed copies were disseminated. The data collection period spanned from November 2024 until February 2025. Participants were required to be at least 18 years old and have a valid driving license. The study focused on several demographic, social, and economic groups, emphasizing drivers from different parts of the governorate. Students from the University of Anbar facilitated the administration of paper-based questionnaires. The minimum needed sample size is calculated using Cochran's technique (Cochran, 1977), as indicated below:

$$\frac{Z^2pq}{d^2} = \frac{1.96^2 \times 0.5 \times 0.5}{0.05^2} = 384 \qquad (1)$$

where p represents the target population (0.5 for a very large population), q=1-p, d is the error margin (5%), and considering 95% confidence interval, equivalent to Z=1.96.

The questionnaire was developed to ensure anonymity, with a neutral tone, and it went through pilot testing, which was carried out according to standardized procedures. For representative sampling, we used a stratified strategy to include various districts and demographic categories (age, gender, education, and driving experience) to better reflect the wider driver population of Anbar Governorate. Participants were recruited from both urban and rural areas, and these steps were taken to enhance the accuracy and generalizability of the findings while recognizing the natural limitations of the survey method.

A total of 730 responses were gathered, with 613 legitimate responses maintained after eliminating 117 incomplete or incorrect submissions. Data was encoded and analyzed via SPSS. Descriptive statistics were employed to encapsulate drivers' demographic and travel attributes, together with their utilization of mobile phone functionalities, including calling and texting. A quantitative demand model was created to analyze drivers' preferences for cell phone usage while driving.

Questionnaire Design

In the questionnaire, each driver must respond to 21 questions including their socio-demographic features, details about their vehicles and driving habits, as well as their behavior concerning cell-phone usage while driving. The questionnaire includes three sections, with a total of 21 questions, as outlined below: The first one is: (a) Drivers' characteristics/personal information (with 6 questions); the second is: (b) Questions on drivers' vehicles and driving characters (with 5 questions), and the third is: (c) Questions on drivers' behavior concerning cell phone usage while driving (with 10 questions), as can be seen in Figure 2.

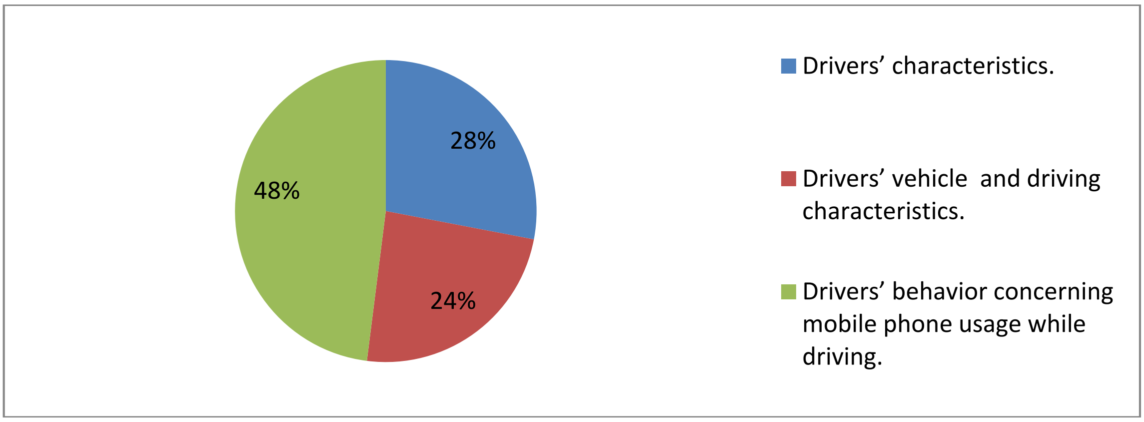

Figure 2. Weights of questionnaire sections shown as percentages

Statistical Analysis

The study data analysis was conducted using IBM SPSS (version 26) in two stages. In the first stage, descriptive statistics were used to provide a summary of basic information about the study participants. In the second stage, binary logistic regression analysis was applied, which is a statistical method that allows multiple independent variables to be used to predict the probability of a binary outcome. In this study, the dependent variable represents whether the driver uses a mobile phone while driving (represented as 1) or does not use it (represented as 0). This model aims to uncover the relationships between the explanatory variables and the dependent variable.

The initial results of the binary logistic regression analysis included assessing the model's statistical significance (at a significance level of $p < 0.05$), estimating beta coefficients and testing their statistical significance. The coefficient of determination (R^2 and adjusted R-squared) was used to measure the proportion of variance in the dependent variable that could be explained by the independent variables. A mathematical model was created to measure drivers' preferences and behavior regarding mobile phone use while driving.

RESULTS

Descriptive Data

Drivers ’Characteristics

Table 1 summarizes the personal characteristics of the surveyed drivers. The majority were males (77.2%) and primarily aged between 25 years and 34 years (40%). Most respondents lived in urban areas (73.7%) and were married (64.6%). In terms of education, nearly a half (48.5%) held a bachelor's degree. Government jobs were the most common occupation (56.6%), followed by self-employment (24%).

Table 1. Descriptive statistics for the personal characteristics of drivers

Gender	Category	Male	Female					Total
	Percentage	77.20%	22.80%					100.00%
Age	Category	18-24 Years	25-34 Years	35-44 Years	45-54 Years	Older than 55 years		Total
	Percentage	17.80%	40.00%	25.00%	12.20%	5%		100.00%
Residence place	**Category**	**Urban**	**Suburban**	**Rural**				**Total**
	Percentage	73.70%	14.00%	12.3%				100.00%
Marital status	**Category**	**Married**	**Single**					**Total**
	Percentage	64.60%	35.40%					100.00%
Educational level	**Category**	**Elementary school**	**Middle school**	**High school**	**Bachelor's**	**Master's**	**Doctorate**	**Total**
	Percentage	7.1%	7.80%	10.80%	48.50%	18.90%	6.90%	100.00%
Job/profession	**Category**	**No job**	**Student**	**Government job**	**Self-employed**			**Total**
	Percentage	6.00%	13.40%	56.60%	24.00%			100.0%

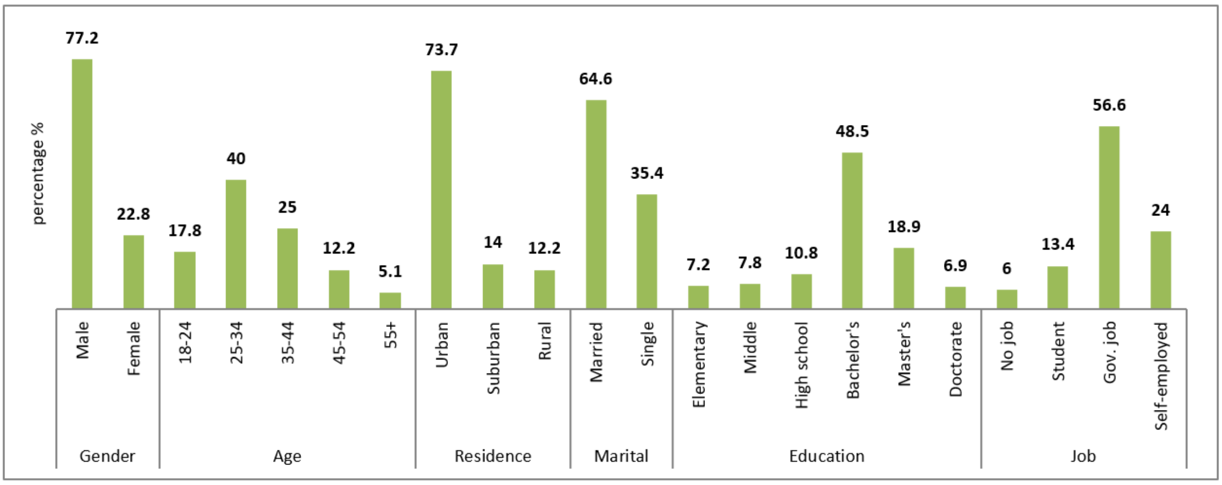

Figure 3. Percentile distribution for the personal characteristics of drivers

Drivers' Vehicle and Driving Characteristics

Table 2 presents descriptive data on the drivers' vehicles and driving habits. Most drivers (83.2%) held private vehicle licenses, and the majority (60.0%) drove small cars. Vehicles manufactured between 2018 and 2024 accounted for the largest share (41.9%). Regarding driving experience, 30.0% had 5–10 years of experience, followed by 27.4% with less than 5 years of experience. Over a half of the respondents (53.8%) reported driving less than 50 km per day.

Table 2. Descriptive statistics for drivers' vehicles and driving characteristics

Vehicle license type	Category	private	public						Total
	Percentage	83.20%	16.80%						100.00%
Vehicle type	Category	taxi	Small car	Four-wheel drive car	Pickup	Minibus	Big bus	a truck	Total
	Percentage	8.80%	60.00%	15.80%	7.30%	3.90%	1.00%	3.2%	100.00%
Vehicle year model	Category	2024-2018	2017-2012	2011-2006	2005-2000	before 2000			Total
	Percentage	41.90%	29.20%	18.80%	4.40%	5.70%			100.00%
Number of years of driving experience	Category	Less than 5 years	10-5 Years	15-10 Years	20-15 Years	more than 20 year			Total
	Percentage	27.40%	30.00%	20.60%	11.90%	10.10%			100.00%
Daily traveled distance	Category	Less than 50 km per day	50-100 km per day	more than 100 km					Total
	Percentage	53.80%	27.40%	18.80%					100.0%

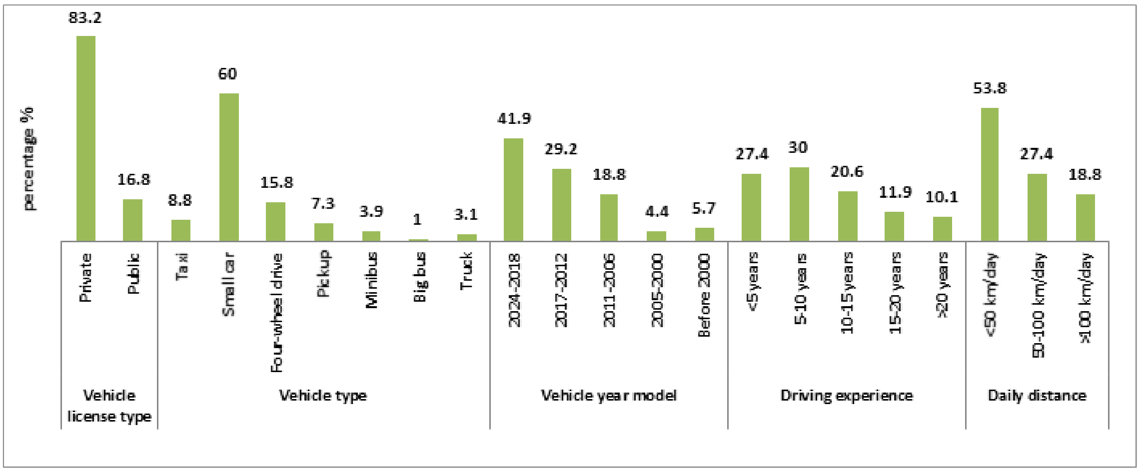

Figure 4. Percentile distribution for the drivers' vehicles and driving characteristics

Drivers' Behavior Concerning Mobile Usage While Driving

Table 3 provides a thorough summary of drivers' behavior related to mobile phone use while driving. It shows that 68% of drivers admitted to using their phones while driving, while only 32% refrained from this behavior. Urban roads were identified as the most common setting for phone use (43.4%), followed by highways outside cities (19.6%). A notable finding is that 51.4% of participants never switch their phones to silent mode, suggesting a limited awareness of the risks related to notifications and incoming calls during driving. Regarding the type of mobile usage, 36.9% of drivers reported receiving calls only, while 11.3% used their phones for multiple purposes, including work, family, and social interactions. Despite the high usage rate, 86.6% of drivers reported no accidents due to mobile phone use, although 27.2% experienced at least one near-collision incident, indicating a significant level of potential risk.

When responding to incoming calls, 41.1% answered while driving, while others adopted safer alternatives, such as Bluetooth (26.9%) or headphones/speakers (21.2%). The main purpose of using mobile phones was a combination of social and work-related reasons (45.2%), followed by social (12.7%) and work-related (10.1%) purposes. In terms of driving performance, inattention (47.9%) was the most commonly reported negative effect of mobile use, followed by vehicle deviation from the lane (23.3%) and reduced vehicle speed (21.5%). Finally, mobile phone use was identified as the most distracting activity (57.7%), surpassing other distractions, such as talking to passengers, eating, and adjusting audio devices.

Table 3. Descriptive statistics for drivers' behavior concerning mobile phone usage while driving

Mobile phone use while driving	**Category**	**No**	**Yes**					**Total**
	Percentage	32.00%	68.00%					100.00%
Areas where mobile phones are used most	Category	No cellphone use	Roads within the city	Crowded residential areas	Highways outside cities			Total
	Percentage	32.00%	43.40%	5%	19.60%			100.00%
Switch the phone to silent mode	Category	Absolutely (no)	Rarely	Sometimes	Mostly	Always		Total
	Percentage	51.40%	21.40%	16.00%	6.40%	4.8%		100.00%
Type of mobile usage while driving	Category	No cellphone use	Taking calls only	Making calls only	Calls and text messages	Social media	Work, family, friends	Total
	Percentage	32.00%	36.90%	10%	8.20%	1.60%	11.30%	100.00%

Previous accidents due to mobile phone use	Category	None	One	Two or more				Total
	Percentage	86.60%	10.10%	3.30%				100.00%
Near miss accident due to mobile phone use	Category	None	One	Two or more				Total
	Percentage	72.80%	18.90%	8.30%				100.00%
Reaction towards phone calls while driving	Category	Ignore calls	Respond while driving	Stop to respond	Use headphone s/speaker	Connect to Bluetooth		Total
	Percentage	3.80%	41.10%	7.00%	21.20%	26.90%		100.00%
Purpose of making calls while driving	Category	No cellphone use	For work purpose	For social purpose		For work/social purposes		Total
	Percentage	32.00%	10.10%	12.70%		45.20%		100.00%
Most obvious effect on driving behavior	Category	Does not affect	Inattention	Reduced vehicle speed	Increase vehicle speed	Vehicle deviates from its path		Total
	Percentage	4.5%	47.90%	21.50%	2.80%	23.30%		100.00%
Most distracting activity on driving behavior	Category	Talking to passengers	Adjusting audio devices	Using a cell phone	Smoking	Eating and drinking		Total
	Percentage	16.30%	8.30%	57.70%	1.9%	15.80%		100.00%

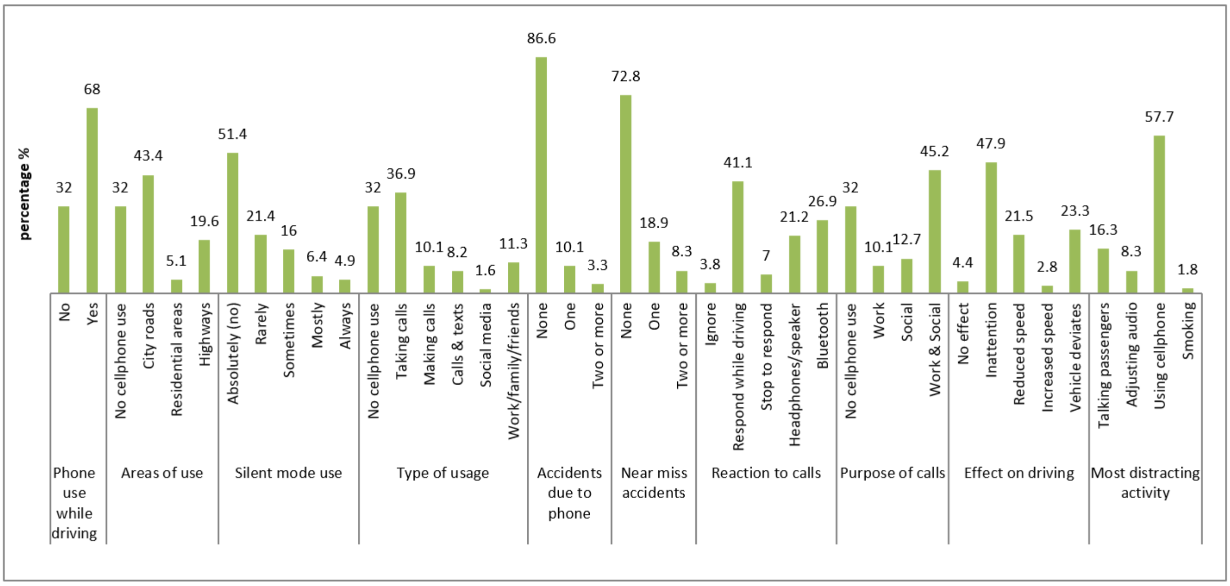

Figure 5. Percentile distribution for the drivers' behavior concerning mobile phone usage while driving

Factors Influencing Mobile Phone Usage While Driving

This sub-section illustrates the results of a binary logistic regression analysis designed to ascertain the determinants affecting the probability of mobile phone usage whilst driving. The dependent variable was binary (mobile phone usage while driving *vs*. non-use), and the analysis was performed using IBM SPSS (Version 26) employing a sequential (hierarchical) entry technique. The variables' coding and definitions are shown in Table 5. All variables in the analysis were entered as categorical. Two sets of predictors were delineated: the initial set encompassed drivers' demographic attributes, vehicle-related data, and general driving behaviors, whereas the subsequent set comprised behavioral and attitudinal aspects associated with mobile phone usage. Table 4 summarizes that several major predictors from the initial block were statistically significant. Gender, vehicle license type, vehicle type, and vehicle model year were identified as significant factors influencing the probability of cell phone usage while driving. Gender exhibited a strong correlation ($p = 0.009$), indicating that male drivers were more inclined to utilize mobile phones while driving compared to their female counterparts. An odds ratio of 0.524 signifies that female drivers had markedly lower probabilities of mobile phone usage in comparison to their male counterparts.

In a similar vein, the type of vehicle license was statistically significant ($p = 0.030$), indicating that drivers possessing public or commercial licenses were 1.879 times more likely to utilize mobile phones while driving compared to those with private licenses. The type of vehicle showed a significant correlation with mobile phone usage ($p < 0.001$), indicating that the propensity for phone use differs among vehicle categories; for instance, operators of commercial or often utilized automobiles may be more inclined to engage with their phones while driving. Additionally, the year model of the vehicle had an inverse correlation with mobile phone usage ($p = 0.020$), with an odds ratio of 0.828, suggesting that drivers of newer vehicles are less inclined to utilize mobile phones while driving compared to those of older vehicles. Conversely, covariates including age, educational attainment, employment position, driving experience, and daily trip distance were not statistically significant predictors in this model. The non-significant result of the Hosmer and Lemeshow test ($p = 0.854$) indicated a good model fit. With a 67.9% overall accuracy, the model demonstrated a moderate ability of prediction.

Table 4. Sequential binary logistic regression model (Block_1)

variables	B	S.E.	Wald	df	Sig.	Exp(B)
Gender	-.647	0.249	6.731	1	0.009	0.524
Age	-.013	0.111	0.013	1	0.908	0.987
Educational level	0.019	0.082	0.054	1	0.816	1.019
Job/profession	0.164	0.117	1.943	1	0.163	1.178
Vehicle license type	0.631	0.291	4.714	1	0.03	1.879
Vehicle type	0.308	0.087	12.469	1	<.001	1.361
Vehicle year model	-.189	0.081	5.387	1	0.02	0.828
Driving experience	0.007	0.097	0.005	1	0.942	1.007
Daily traveled distance	-.028	0.13	0.047	1	0.828	0.972
Constant	0.13	0.728	0.032	1	0.858	1.139
Predicted variable is mobile phone using while driving (No, Yes); Reference category (No).						
Model Accuracy = 67.9%						
Hosmer and Lemeshow Test: Chi-square =4.029; Sig. =0.854 (Good).						

In the second block of the sequential binary logistic regression model, a collection of behavioral and attitudinal factors pertaining to cell phone usage while driving was incorporated with the demographic and vehicle-related predictors from Block 1 to assess the model's improved predictive capability. Table 5 indicates that multiple variables from the initial block retained statistical significance. The type of vehicle license ($p = 0.024$) was a significant predictor, demonstrating that drivers with public or commercial licenses were over twice as likely to utilize mobile phones while driving in comparison to those with private licenses. Similarly, vehicle type ($p = 0.005$) and model year ($p = 0.021$) exhibited significant correlations, indicating that older or more frequently utilized automobiles are associated with increased mobile phone usage. Several newly incorporated behavioral predictors exhibited robust and statistically significant correlations. The variable "areas with predominant phone usage" had a negative correlation with mobile use ($p = 0.009$), potentially indicating increased caution in high-risk driving areas. Likewise, drivers who activated silent mode on their phones while driving had a markedly reduced likelihood of usage ($p = 0.017$), signifying proactive risk-avoidance behavior. Two of the most significant predictors were prior accidents attributable to mobile phone usage ($p < 0.001$) and near-collision occurrences ($p < 0.001$), indicating that first-hand experience with risk does not inherently deter further mobile use while operating a vehicle. The variable denoting drivers' responses to phone calls was statistically significant ($\chi^2 = 18.263$, df = 4, $p = 0.001$). Drivers who answered calls while driving were approximately ten-fold more likely to utilize mobile devices ($p < 0.001$). Similarly, individuals who paused to react ($p = 0.046$) utilized headphones or speakers ($p = 0.010$), or connected via Bluetooth ($p = 0.005$) had a much higher propensity to use their phones while driving, indicating that hand-free alternatives may exacerbate phone usage rather than alleviate it. The objective of making calls while driving exhibited a notable negative correlation with phone usage ($p = 0.014$), indicating that drivers whose calls serve dual work and social purposes are more prone to mobile use, whereas those with less compelling motivations may be more likely to refrain from phone use while driving. Conversely, demographic and occupational variables including gender, age, education, job type, driving experience, daily distance traveled, and mobile usage type were not statistically significant in this block, signifying their restricted explanatory value once behavioral factors were incorporated. In comparison to the previous block (67.9%), the model's overall classification accuracy improved to 77%. As indicated by the non-significant Hosmer and Lemeshow test ($p = 0.101$), this improvement shows that incorporating behavioral and exposure-related factors significantly improved the model's accuracy in predicting while preserving an acceptable fit (Hosmer Jr et al., 2013).

The binary logistic regression model was used to predict the probability of using a mobile cell phone while driving. The general utility equations are:

$$p = \frac{1}{1 + e^{-Y}} \tag{2}$$

$$Y = \alpha + \beta 1X1 + \beta 2X2 + \beta 3X3 \tag{3}$$

The parameter estimate outcomes of the logistic regression model are listed in Table 5.

The utility functions are as follows:

$$Y = -1.742 + 0.766\,X1 + 0.275\,X2 - 0.220\,X3 - 0.315\,X4 - 0.211X5 + 1.511\,X6 + 1.543\,X7 + 2.304\,X8 + 1.391\,X9 + 1.616\,X10 + 1.755\,X11 - 0.281\,X12 \tag{4}$$

After substituting the estimated coefficients into the general model, the final form of equation is obtained. This can be used to estimate the probability of mobile phone use while driving.

$$p = 1/(1 + e\text{^}(-1.742 + 0.766\,\mathrm{X1} + 0.275\,\mathrm{X2} - 0.220\,\mathrm{X3} - 0.315\,\mathrm{X4} - 0.211\mathrm{X5} + 1.511\,\mathrm{X6} + 1.543\,\mathrm{X7} + 2.304\,\mathrm{X8} + 1.391\,\mathrm{X9} + 1.616\,\mathrm{X10} + 1.755\,\mathrm{X11} - 0.281\,\mathrm{X12})\,) \tag{5}$$

Table 5. Variables' coding and definitions

Variable	Definition
Dependent variables Using mobile phone or not	No:0,Yes:1
Independent variables	
Vehicle license type (X_1)	Private:1, Public:2
Vehicle type (X_2)	Taxi:1, Small car:2, Four wheel drive car:3,Other:4
Vehicle year model (X_3)	2024-2018:1, 2017-2012:2, 2011-2006:3, 2005-2000:4, Before 2000=5

Areas where mobile phone is mostly used(X_4)	Not using:0, Roads within the city:1, Crowded residential areas=2, Highways outside cities=3
Switch the phone to silent mode (X_5)	No=0, Rarely=1, Sometimes=2, Mostly=3, Always=4
Previous accidents due to mobile (X_6)	None=0, one=1, Two=2, Three or more=3
Near accident due to mobile (X_7)	None=0, one=1, Two=2, Three or more=3
Reaction towards phone calls while driving Respond while driving (X8), stop to respond(x9), Use headphones/speaker (10), Connect to Bluetooth (11)	Ignore calls=0, Respond while driving=1, stop to respond=2, Use headphones/speaker=3, Connect to Bluetooth=4
Purpose of making calls (x12)	Not using=0, For work purpose=1, For social purpose=2,other=3

Table 6. Sequential binary logistic regression model (Block_2)

variables	B	S.E.	Wald	df	Sig.	Exp (B)
Gender	-.209	0.29	0.522	1	0.47	0.811
Age	-.202	0.135	2.232	1	0.135	0.817
Educational level	0.055	0.094	0.344	1	0.558	1.056
Job/profession	0.155	0.14	1.225	1	0.268	1.168
Vehicle license type	0.766	0.338	5.128	1	0.024	2.15
Vehicle type	0.275	0.098	7.858	1	0.005	1.316
Vehicle year model	-.220	0.095	5.339	1	0.021	0.802
Driving experience	0.131	0.112	1.351	1	0.245	1.14
Daily traveled distance	-.007	0.15	0.002	1	0.965	0.993
Areas where mobile phone is mostly used	-.315	0.12	6.883	1	0.009	0.73
Set mobile cell phone to silent while driving	-.211	0.088	5.698	1	0.017	0.81
Type of mobile usage while driving	0.059	0.08	0.54	1	0.462	1.061
Previous accidents because of mobile phone using	1.511	0.399	14.329	1	<.001	4.53
Near accident because of mobile phone using	1.543	0.278	30.73	1	<.001	4.677
Reaction towards phone calls (Ignore calls)			18.263	4	0.001	
Reaction towards phone calls(Respond while driving)	2.304	0.625	13.567	1	<.001	10.01
Reaction towards phone calls (stop to respond)	1.391	0.698	3.968	1	0.046	4.02
Reaction towards phone calls (Use headphones/speaker)	1.616	0.631	6.565	1	0.01	5.034
Reaction towards phone calls(Connect phone with Bluetooth)	1.755	0.623	7.938	1	0.005	5.785
Purpose of making calls while driving	-.281	0.114	6.078	1	0.014	0.755
Constant	-1.742	1.117	2.432	1	0.119	0.175
Predicted variable is mobile phone using while driving (No, Yes); Reference category (No).						
Model Accuracy = 77 %.						
Hosmer and Lemeshow Test: Chi-square =13.322; Sig. =0 .101(Good).						

The results demonstrate that mobile phone usage during driving is affected by both vehicle-related and behavioural factors. Drivers possessing public or commercial licenses, operating older vehicles, or having prior accident experience exhibited a higher propensity to use mobile phones. Conversely, precautionary measures, including activating silent mode or refraining from phone use in high-risk areas, diminished this likelihood. Responses to incoming call, whether through hand-free methods or by pausing to answer, also influenced phone usage. The findings indicate that socio-cultural norms and individual attitudes towards risk significantly influence driving behaviour. Comprehending these factors yields critical insights for the formulation of targeted interventions and road safety policies designed to mitigate distracted driving within the local context.

DISCUSSION

The findings of this study confirm the widespread prevalence of mobile phone use while driving in Anbar Governorate, with 68.0% of drivers primarily within urban areas (43.4%) admitting to engaging in this behavior. The study's unique contribution lies in being the first to provide empirical evidence from the region, showing that behavioral and contextual factors, such as call-handling methods and reasons for phone use, are stronger predictors than demographic traits. These results extend existing knowledge by offering context-specific insights that address a local gap and support targeted traffic safety interventions. This trend is also consistent with international research, such as Oviedo-Trespalacios et al. (2019), who noted that urban environments are often associated with higher levels of driver distraction due to frequent traffic interruptions and the false perception of safety during slow movement (Oviedo-Trespalacios et al., 2019). Although many respondents had higher educational attainment and access to newer vehicles, the adoption of precautionary behaviors was relatively limited. For example, more than 51.4% of drivers said that they never put their phones in silent mode, leaving them open to continuous notifications and alerts. This outcome conforms to the World Health Organization's findings from 2022 (Central Statistical, 2023), which showed that even passive distractions, like auditory alerts, can raise the chance of traffic accidents considerably.

Furthermore, although the majority of drivers (86.6%) had no prior cell phone-related accident history, a significant portion (27.2%) had at least one near-collision occurrence. This supports the results of Caird et al. (2018) and Feng et al. (2020), who proved that distracted driving by a cell phone significantly impairs driver performance, concentration, and reaction time, independent of whether or not it causes an accident (Caird et al., 2014; Fombonne et al.). The logistic regression analysis used in this study provided deeper and more comprehensive insight into the factors influencing using a cell phone while driving. Drivers with commercial or public vehicle licenses were 1.88 times more likely than those with private permits to use a cell phone while operating a motor vehicle. According to studies conducted by Ismeik and AlKaisy (2015) in Jordan and Bener et al. (2006) in Qatar, professional drivers use their phones more frequently because of their job. These findings are consistent with trends seen in other locations. The findings are placed in a larger context by contrasting these findings with research from other countries, which emphasizes how consistent this behaviour is across areas dealing with comparable issues Ismeik et al., 2015; Bener et al., 2006. The overall accuracy of the second model, which contained behavioral and attitudinal factors, was 77%, and by using Variance Inflation Factors (VIFs), multi-collinearity was evaluated; all results were less than 2, indicating that multi-collinearity was not an important concern in the present study. Notably, drivers who had prior near-collisions or accidents as a result of using their phones were more than four times more likely to carry on with this dangerous habit. These findings are consistent with Beanland et al. (2013), who emphasized that prior experience alone does not necessarily lead to behavior change unless accompanied by targeted educational or regulatory interventions (Beanland et al., 2013).

Additionally, the study found that answering calls while driving —whether by hand or with hand-free devices—was substantially linked to higher mobile phone use, with respondents being over ten times more probable to do so. This result complies with a study in 2021 conducted by Mutar et al. in Iraq, which found that using a phone, whether hand-held or hand-free, has limited safety benefits and induced attention deficits and delayed cognitive reactions (Mutar et al., 2021). The final model did not include demographic variables like age, gender, job, and level of education as statistically significant predictors. Likewise, the type of mobile phone use, daily distance driven, and driving experience did not achieve statistical significance. This indicates that driving behavior is more heavily influenced by personal attitudes, habitual usage patterns, and the perceived necessity of using a mobile phone. This observation is consistent with the results of Montuori et al. (2021), who indicated that even drivers who are knowledgeable about the dangers associated with mobile devices may still engage in these kinds of activities if their attitudes and behaviors support them

(Montuori et al., 2021)

Moreover, some confounding factors, including infrastructure characteristics, environmental complexity, and traffic density, were not taken into consideration in this study. These elements have the potential to greatly affect how people drive and use their phones while operating a vehicle. Their possible effects could not have been fully reflected in the data, since these environmental elements were not directly assessed throughout the analysis.

To gain a better understanding of driver behaviour, future studies should include a more complete evaluation of both observable and unobservable factors, such as variables related to infrastructure and the environment.

In summary, the results of this investigation are in accordance with an extensive body of research focusing on the risks associated with using mobile phones while driving. They highlight the pressing need for comprehensive interventions that address the behavioral and cognitive factors influencing driver distraction by combining technology, awareness campaigns, and legislation. These strategies are crucial for lowering traffic hazards and enhancing road safety, especially in areas that are developing quickly, like Iraq.

Limitations

This study is subject to several limitations that should be acknowledged. A considerable portion of the data was collected online, which restricted participation to individuals with sufficient knowledge of technology. Moreover, a substantial share of the collected answers is likely to have been affected by biases, particularly social desirability and under-reporting, which may have reduced the accuracy and reliability of the reported behaviors. The reliance on self-reported survey data also implies that the captured responses may not fully represent actual driving behaviors, given that situational and environmental factors in real traffic conditions can strongly influence drivers' decisions. Furthermore, only adult drivers (18 years and above) were considered in this study, which, along with the exclusion of novice teenage drivers, narrowed the representativeness of the sample and thereby affected the generalizability of the findings. The cross-sectional design limited the ability to establish causal relationships among the examined variables, while the study's focus on Anbar province restricts the applicability of the results to other regions of Iraq with different demographic, cultural, and traffic characteristics.

CONCLUSIONS

This study investigated the influence that cell phone use has on Anbar Governorate traffic safety and driver behavior. Its main contribution is that it presents the first empirical data from this area, showing that the use of mobile phones while driving is very common (68%) and that behavioral factors, like where the phone is used, how drivers answer calls, and why, are better indicators than demographic characteristics. These findings bridge a local research gap and provide context-specific insights to inform traffic safety regulations by highlighting the critical role that routines and personal beliefs play in influencing driver behavior.

In response, the study proposes a comprehensive strategy to address distracted driving, including stricter law enforcement, targeted awareness campaigns, in-vehicle technological interventions, and behavior change techniques. Future research should employ more representative sampling strategies and utilize longitudinal designs to capture changes in driver behavior over time, ensuring broader applicability. Additionally, incorporating objective monitoring tools (e.g. dashcams or telematics) would improve data accuracy. Expanding the analysis to multiple provinces across Iraq makes the findings more generalizable across diverse regions and contexts. Moreover, future studies should consider the environmental factors, such as infrastructure characteristics, traffic density, and local driving conditions, to ensure a complete understanding of the factors influencing driver behavior.

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