

Research Paper: Drivers' Addiction Toward Cell Phone Use While Driving



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ABSTRACT

Background: The use of a cell phone when driving has been recognized as a type of distraction worldwide. Addictive tendency to use technology, including cell phone use while driving may be a substantial problem for drivers and increasing risk of accidents. The aim of this study was to evaluate the effect of drivers' addiction to use a cell phone while driving.

Materials and Methods: A sample of 400 drivers with ages 18-65 years old completed a questionnaire which was designed based on Theory of Planned Behavior (TPB). Hierarchical regression analysis was utilized to predict drivers' addiction to use a cell phone while driving on demographic characteristics and TPB components.

Results: Drivers had mean age of 35.63(8.72) and were 77% male, and 23% female. Tests of validity and reliability were conducted for every variable. According to findings, the hierarchical regression analysis model showed that the TPB was able to predict 59% variance in addiction toward cell phone use and attitude emerging as the strongest predictor during this analysis. All components of TPB were more independent to age than gender.

Conclusion: The fundamental TPB components were directly associated with the addiction to use a cell phone when driving. The present study has identified that older drivers were considerably less probable to use a cell phone while driving. Also this study showed that males use a cell phone significantly more frequent. More practical road safety measures are required to rebuff and mitigate the effects of using cell phones while driving.

Keywords:

Human factor, Traffic accident, Distraction, Cell phone, Driver

1. Introduction

Using a cell phone while driving is illegal in most countries (e.g. New Zealand, in some states in the United States, Iran), though laws are different in various countries [1-3]. Cell phone possession is very common among young adults these days [4]. It also

has considerably changed the ways in which their daily living activities evolved business [5], learning [6] and much more. Currently, it has become a tool for many young people to improve their life style. This scenario has changed drastically as even a decade ago possessing a cell phone was very rare [7, 8].

It is possible that people use their cell phone while driving because of its advantages such as keeping in touch

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with others [9], and access to information through different applications. Unless these factors could also be useful in several areas, the potential for drivers, when driving, to answer the call from others instead of focusing on the driving task. Cell phone usage while driving has been related to risks of accidents, since using cell phone reduces drivers' attention to road conditions and driving duties [9–13]. Use of cell phone while driving may cause driving distraction that can be split into 2 categories: physical distraction (e.g. removing one hand from the steering wheel to hold and operate the cell phone, taking eyes off the road and looking at keyboard), and cognitive distraction (e.g. concentrate more on the talking and ignoring the successive change of situations). There has been a substantial amount of research to determine the effects of cell phone use on drivers' behavior. Several studies have established that driver's efficiency reduces due to cell phone use while driving [14–19].

Driver distraction

Driving is a complicated procedure that requires coordination of hand, feet, and eyes [20]. Poor coordination can lead to road accidents. For example, drivers are likely to overlook important traffic control systems such as stop sign, traffic lights, and speed bumps; and once noticed, they react more slowly to the signals and more likely to be engaged in rear-end accidents while they are using their cell phone [18, 21]. The highest number of the accidents are usually associated with young drivers [22]. Comparing different groups, it has been proven that the young drivers are the age group with highest tendency to use their cell phone while driving [23]. It has also been demonstrated that using cell phone while driving impairs young driver's performance [1, 17, 18, 24–28]. These facts specify that behavioral problem of using cell phone exists. Although there are social and legal regulations for some of the behaviors, drivers disregard these prohibitory regulations for using cell phone even when accident risk is high [4]. It is true that people use their cell phone while driving in spite of risks and prohibition of the use, and therefore psychologists as well as researchers should be worried about the factors associated with the behavioral problem due to cell phone use.

Behavioral problem related to cell phone use may be cause of factors which is already available that probably the users will involve in this behavior in spite of being aware of its outcome. The word addiction, especially psychological predictors of addiction is used to explain the reason of increase in behavioral problem related to cell phone use while driving.

Behavioral addiction

The traditional concept of addiction is defined by a medical definition and indicated as any dependence on a material either alcoholic drinks or narcotics. Recently, researchers have studied the addiction medicine model because the definitive model and have argued that the concept of addiction needs to cover a variety of behaviors. Several researchers have ratiocinate validity of a model of behavioral addiction [29–31]. Thus, this study was undertaken to investigate addiction to technology. Researchers argue that addiction to technology are a set of behavioral addictions, which behavioral addictions characteristics are the main parts of addiction such as isolation, euphoria, endurance, prominence, tension and rage are authentic addictions [30–36]. Overuse of different types of technology ought to be labeled as an "addiction". Some researchers have found evidence to suggest that overuse of technology could be considered as a problem [37, 38]. Regardless of these behavioral issues is literally addictions, yet this is still a beginning to study problems of behaviors like using cellular phone problem.

Addictive tendencies toward cell phone use

Study has found that signs of behavioral addiction among youth is due to misuse of cell phones [39]. Furthermore, a recent study in Australia showed signs of addiction to be associated with problem of using cell phones, such as use of a cell phone while driving [32]. Addictive behavior suggests that individuals do a coercive driving to interact in an actuality in spite of nugatory sequels of the behavior or social constraint [40]. In this way, addicted people can carry on to have interaction within the pertaining behavior despite of demands to stop, also the illegal inherent of certain types of behavior. As mentioned earlier, though cell phone use is illegal while driving, some people keep using a cell phone without hands free accessories for both messaging and calling. Since signs of addiction toward cell phone have been found among young people [39], it should be noted that addictive attitude is causing several drivers to use cell phones while driving. This information might help clarify why people are forced to keep using a cell phone while driving despite legal prohibition.

According to the previous researches [12, 41, 42], young drivers tend to use cell phones while driving more than elders; and among women this tendency is nearly twice than men [12]. Research shows that cell phone usage while driving is increasing annually [43, 44]. To increase understanding in this area, there is a requirement to find the agents influencing this behavior. The cur-

rent study evaluated the association between addictive inclinations to use a cell phone and using a cell phone while driving. This study uses Theory of Planned Behavior (TPB) to evaluate the addiction to cell phone usage while driving. Gender and age were most important predictors for the analysis.

Theory of Planned Behavior (TPB)

The TPB [45] maintains that inclinations are foremost approximately behavioral determinant. Inclinations are affected by the attitudes (positive or negative assessments of performing a behavior), subjective norms (believed societal compres to perform or lack of performing a behavior), and Perceived Behavioral Control (PBC). Attitude is known as behavioral beliefs, subjective norms as normative belief, and PBC is known as control beliefs [46]. The conceptual framework which may best express this category has been found within the TPB [47]. On the other hand, the behavioral effect on exogenous variables (e.g. demographic variables) to the TPB are moderated during parts of the model. One of the aims of the current study was to test whether the effects of demographic variables on drivers' addictive behavior were mediated by the TPB.

By using survey data, the principal objectives of the current study are as follows: (a) employing the theory of planned behavior to assess addiction to cell phone usage while driving; and (b) assessing the vastness of the impact of the components of theory of planned behavior, driving attitude toward cell phone and demographic variables.

2. Method

Participants

A total of 400 drivers participated in this survey between the ages of 18 and 65 years. The patients included 30 males (18-27 years old), 278 males (older than 28 years), 31 females (18-27 years old), and 61 females (older than 28 years). The subjects were classified into 2 categories, younger drivers (18-27 years old, mean age 24.57, standard deviation 2.15 years), and elderly drivers (>28 year old, mean age 37.62, standard deviation 7.92 years). All respondents had a driving license.

Questionnaire

The questionnaire data was collected in Gorgan, Iran. The survey was conducted from October 15 to December 27, 2015. The questionnaire consisted of 68 questions and was divided into three parts: demographic questions, TPB questions, and addictive behavior questions. Under

demographic questions the following data was obtained: age, education, income, gender, and driving experience. The main model of TPB involved attitude, subjective norm, and Perceived Behavioral Control (PBC). The beliefs utilized in our questionnaire are based on a selection of beliefs influences reported earlier [48, 49].

The structure of TPB were built by customary measures [42] and respondents were requested to express their degree of agreement on a five-point Likert scale where one accorded to completely disagree and five to completely agree. Each construct and its measures are described below:

Addiction measures

Nine questions were used to measure addictive inclinations to use cell phone. These questions examined tendencies (e.g. "I feel my life is boring without a cell phone"), disputes with different operations (e.g. "I interrupt whatever else I am doing when I am using my cell phone"), and loss of rein (e.g. "I lose track of how much I am using my cell phone"), which are severely associated with addictive behavior.

Attitude

Three questions were used to measure participant's attitude, namely, 1. "Do you agree that receiving information (e.g. direction, important news) is an advantage of cell phone?", 2. "Do you agree that using time effectively is an advantage of cell phone?", and 3. "Do you agree that receiving assistance in an emergency is an advantage of cell phone?"

Subjective norm

It was evaluated with one question, "If you were driving, do you agree that those people who care about you ask you to utilize your cell phone while driving?"

Perceived behavioral control

One statement was used, "I have full control of everything when I use my cell phone while driving".

3. Result

Test of validity and reliability

Bi-variate spearman correlation was used to establish relation between age, addictive tendency, and theory of planned behavior. Hierarchical regression analyses were performed to evaluate the factors that predict driver's in-

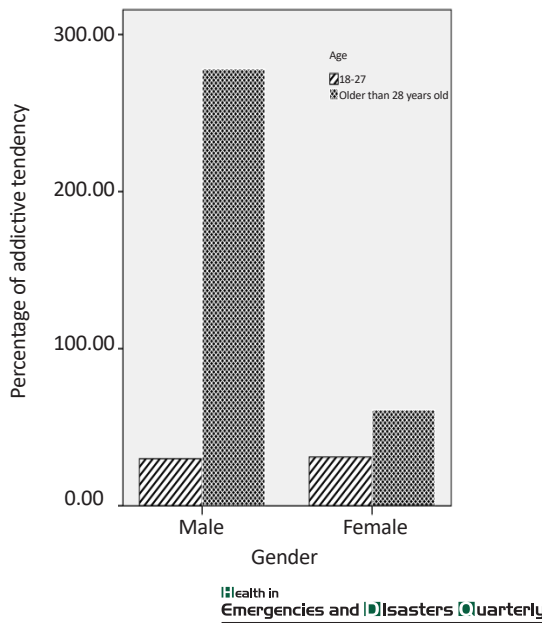


Figure 1. Percent of age, addictive according to gender

tention to cell phone use. Data were evaluated by using IBM SPSS software.

The major analysis was applied to analyze the options regarding behavioral inclinations, attitude, subjective norm, and perceived behavioral control. Additionally, validity of the model was obtained by measuring Cronbach’s alpha for each scale utilized in TPB options. For every subset (e.g. the behavioral addiction, attitude, subjective norm, PBC), A reliability scale of addictive tendency and TPB components was high (Cronbach’s alpha=0.72 or higher), which was developed by summing up and averaging scores. Cronbach's alpha values indicated that referrals are authentic (Table 1).

Descriptive findings

As shown in Figure 1, a comparison of cell phone use while driving based on gender (male versus female) was done. In older participants (28+ years), number of respondents who reported to have been addicted to

their cell phone while driving was much higher in male (69.5%) compared to female (15.25%). Younger (18-27 years old) female respondents were much more (8.75%) addicted to their cell phone while driving than younger male (6.5%). Moreover, males were more addictive toward cell phone use while driving (Figure 1).

Addictive tendencies towards cell phone use while driving

To investigate the relationships among addictive inclinations to cell phone use while driving, TPB, and age, we calculated bivariate spearman correlations. Since young drivers are more likely to interact in overuse of cell phone, the analyses were performed to assess the relationships among addictive tendencies, TPB’s components, gender and age. The commentary correlations shown in Table 2 are between the addiction and attitude, subjective norm, perceived behavioral control, age, and gender.

The direct correlations between the addictive tendencies scale and gender, perceived behavior control, and subjective norm suggest that those with higher subjective norm and higher perceived behavior control had higher tendency to cell phone addiction. The indirect relation between age and the addictive tendencies represent youth desire addiction to use their cell phone. This opposition is confirmed by evaluating the mean scores of addictive tendencies consistent with ages (Table 3) that young people had a higher addictive tendencies mean score than elders.

Predictors of addiction: Hierarchical regression analyses

To predict addictive tendency, hierarchical regression analyses were applied to examine the distribution of gender, the TPB, and age. Furthermore, since adolescents are more prone to overuse of cell phone, the analyses were performed to assess the relation between addictive tendencies and age. The predicting of driving addiction

Table 1. Cronbach’s α statistics for theory of planned behaviour

Variable	Number of Items	Cronbach’s α	% of Variance
Addictive tendency	9	0.78	83.46
Attitude	3	0.72	79.12
Subjective norm	4	0.81	55.30
Perceived behavioral control	4	0.85	42.33

Table 2. Bi-variate correlations among addictive tendencies, TPB’s variable, age and gender

Variable	M	SD	Addictive Tendency
Age	3.74	1.15	- 0.203
Attitude ^a	3.7	0.61	- 0.07**
Subjective norm ^a	2.66	0.85	0.205**
Perceived ^a	3.61	0.62	0.13**

**P<0.001

a: Scaled from 1=strongly disagree and 5=strongly agree

to use of a cell phone while driving was determined by fitting addictive tendencies on the demographic variables at first step and the TPB variables (attitude, subjective norm, and perceived behavioral control) at second step. In this manner, it is possible to evaluate the TPB after qualifying the impact of age and gender (Table 4).

According to beta-weight in step 1, gender and age were responsible for 16% of the variance, therefore variables were not considerable predictors. In step two, the TPB elements, once entered into the regression, represented 43% of the variance, and entirely statistically increased to 59% with attitude, subjective norm, and behavioral control appeared as considerable predictors (P<0.001). Gender was not considerable variable for regressions, and age had a substantial effect. In the regression model, it was very obvious that subjective norm was less significant variable in predicting addictive tendencies to cell phone use than attitude and perceived behavioral control. Attitude was the most important predictor of addictive tendencies toward cell phone use.

4. Discussion

Cellphone use while driving is a common practice among people despite the inevitability of driving risks. This study investigated addictive tendency toward using cell phone while driving. Present study evaluated drivers’ addiction to use a cell phone while driving considering demographic variable (age, gender) and TPB.

The TPB obtained the frame for the current study and evaluated the impact of attitudinal, normative, and control variables over drivers’ addiction to their cell phone while driving.

TPB predictors

For the aim, the results of the current study presented sturdy endorsement for the TPB’s usage to evaluate drivers’ addiction to use a cell phone while driving, and it appears possible that the addiction to use a cell phone could be modified with the suitable changes in their attitudes, subjective norms, and behavioral control. We determined the accredit of fundamental subsets by using the analyses. The results provide substantial evidence to endorse the usage of TPB. In accordance with previous research [35, 50], the fundamental of TPB elements involving attitude, subjective norm, and behavioral control were directly linked to addiction to use a cell phone while driving.

After checking the influence of respondents’ specifications (gender, age), the TPB calculated for a considerable value (43%) of the variability in addiction to cell phone use while driving. The TPB constructs expected driver’s addiction, indicating that young drivers who use cell phone while driving more desirable and who think that doing so is related to their attitudes are more likely to be addicted to use their cell phone while driving. In summary, the results suggested the impression of atti-

Table 3. Mean level of addictive tendencies according to age grouping

Age Grouping	M	SD	N
18-27	24.57	2.15	61
28<	37.62	7.92	339
Total—all ages	35.63	8.71	400

Table 4. Hierarchical regression analysis: predicting addictive tendencies

Steps and Predictors	β (Step 1)	β (Step 2)
Age	- 0.26	- 0.20**
Gender	- 0.05	- 0.04
Attitude		0.64
Subjective norm		0.20**
Perceived behavioral control		0.43**
F	12.51	18.65
R ²	0.16	0.59
ΔR^2		0.43

**P<0.001

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tude, subjective norm, and perceived behavioral control as important variables to predict behavioral addiction to use cell phone while driving. The element of attitude was most susceptible in predicting behavioral addiction as mentioned by the standardized beta weights in analysis. With improving attitude enhance and behavioral addiction modification, performing an individual's societal behavior intervention will be successful.

The positive standardized beta weights suggest that behavioral addiction should be corroborated by enhancing attitude, subjective norm, and behavioral control. Additionally, the regression in cell phone addiction indicated that the TPB variables were typically more significant than the demographic variables. In analysis, attitude was the most significant prophesier of addiction, virtually as much as perceived behavioral control and subjective norm chipped in prediction.

Demographic variable

Reports suggest younger drivers are more likely to be involved in crashes due to their inexperience in driving [44, 51]. Analyses were performed in young and old people to ascertain differences in cell phone addiction. Earlier studies suggested that older individuals are less demanding than younger individuals to use cell phone [12, 32, 42, 52]. According to Walsh et al. [49] age believed to be a statistically important predictor of the addiction to use cell phone while driving. Our findings are consistent with that of Brickfield et al. (1986) who realized that this is due to the fact that older individuals have less positive attitudes to different technological devices than youngsters. Therefore, older people are less likely to use cell phone. On the basis of such evidence, it might

not anticipated older drivers dedicated as much time on their cell phones as younger drivers [32, 53].

More male drivers were typically to use their cell phone while driving and the result of this study confirmed their cell phone use. This finding is in agreement with that of Sullman & Baas (2004) and Gras et al. (2007). Male participants reported to be more addicted toward using a cell phone while driving than female participants [54, 55]. In the regression analyses the standardized beta weights were negative, indicating that the gender was not an important variable for predicting the addiction toward using a cell phone.

5. Conclusions

Many previous studies [50] indicated that the TPB able to expand interpositions, instead of examining their efficacy. The results of the current study obtained confirmation to the TPB's usage to evaluate participant's addictions to use cell phone while driving, and it appears possible that cell phone use addiction could be modified with the variations in their attitudes, subjective norms, and PBC. Particularly according to sensitive attitude in predicting behavioral addiction as previously mentioned by the scale of the standard beta weights in hierarchical regression model, with promoting attitude increase and addictive modification, performing an individuals societal behavior interposition will be successful.

Taken together, attitude was found to be the most volatile predictor of addiction to use cell phone while driving, indicating that drivers with a positive attitude to use cell phone while driving have higher tendency to interact during this behavior. Realization of control over restric-

tive factors cell phone use while driving was not extremely impressive. Strategies to reduce cell phone use while driving ought to concentrate on altering individuals attitudes to have less confirmative of using cell phone while driving and prominent that the important people in our lives would not confirm of safety to enable connection. Future research should be directed to concentrate more on driver's attitude, PBC, and subjective norm separately. Addiction to cell phone and its application while driving is important and researcher can focus on them.

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Conflict of Interest

The authors declared no conflicts of interest.

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