CHAPTER 3

CASE STUDY

3.1 INTRODUCTION

There are various researches carried out by McEvoy et al (2005), Glaze and Ellis (2003), Gordon (2005), Klauer et al (2006) to understand the real risk associated with the use of a cell phone while driving, which may lead to road crash or accidents. The collection of information about the cell phone involvement in road crashes was neither widespread nor particularly systematic, which makes it difficult to estimate the danger of a cell phone use in vehicles. The study carried out by Lissy et al (2000) shows, about 6% of automobile accidents are caused by cell phone use. While a study, conducted by Glaze and Ellis (2003) used crash records collected by troopers during 2002 to determine the most common sources of driver distraction contributing to crashes in Virginia and found using a mobile phone accounted for 3.9 percent of all reported distractions. These studies were considered underestimate because the presence or use of a cell phone in a vehicle was not recorded in most countries. Even recorded, drivers may be reluctant to report the truth due to potential prosecution. Therefore, it was suggested that there was a serious problem of under-reporting regarding road crashes involving mobile phones.

The study performed by Violanti and Marshall (1996) shows, talking more than 50 minutes per month on cellular phones in a vehicle was associated with a 5.59-fold increased risk in a traffic collision. The NHTSA
reported in 2001 that “Distractions from the cell phone use could be a factor in 20 to 30 percent” of car accidents. While, the study carried by Hugh and Jawkuan (2001) examined the accident reports for a period of few months in Taiwan and found nearly 20% of mobile phone use while driving involved in accident.

The findings of Werge-Nadeau et al (2001) revealed that, for drivers who use cell phone while driving, the risk of been involved in an injury crash and all crash types was 38 percent higher than it was for with non-users, and heavy cell phone users were exposed to more than twice the risk as normal users. The study conducted by Helmick et al (2002) prepared a Traffic Collision Report. The report intent of the six-month data collection was to collect “information as to whether a cellular telephone or other driver distraction or inattention is a known or suspected associated factor to the cause of the traffic collision.” The study reported that out of 5,677 persons involved in collisions identified as being inattentive and adding to the cause of the collision, 11% of those persons were inattentive due to cell phone use.

The study in examining the role of various internal and external distractions, including mobile phones that contribute to crashes was carried out by Gordon (2005). Results revealed that driver distraction in relation to the role of mobile phone use in crashes showed the telecommunication devices (including mobile phones, pagers and radio-telephones) were identified as a source of distraction in approximately 12 percent of all internal distraction-related crashes. The majority (93 percent) of the telecommunication devices involved in the telecommunication related crashes was mobile phones. Of all the telecommunication based crashes, 40 percent involved the driver responding to an incoming call or message, 35 percent involved the driver conversing on the phone or sending a text message, and 15 percent involved the driver searching for, or replacing, the phone or pager.
The impact of mobile phone use on crash risk was also analyzed by McEvoy et al (2005). Authors collected data from hospital attendance between April 2002 and July 2004 on who owned or used mobile phones and involved in a road crash. They concluded the study by finding, driver's use of a mobile phone up to 10 minutes prior to a crash (and also up to 5 minutes before the crash) was associated with a four-fold increase in the likelihood of having a crash resulting in hospital attendance. Importantly, crash risk was raised regardless of whether the phone was hand-held or hands free. There was a 3.8 times increase in the likelihood of having a crash causing injury for hands-free phones, and a 4.9 times increase for the hand-held phone.

The work carried out by Kaluer et al (2006) found, 93 percent of crashes with a lead vehicle (rear-end crashes) involved inattention as a contributing factor. Wireless devices (mainly mobile phones but including PDAs) was the most frequent contributing factor, followed by passenger-related distraction and then internal distractions for rear-end crashes. The trend was similar for near crashes.

The study conducted by Kaluer (2006) of the Virginia Tech Transportation Institute (VTTI), by following the behavior of drivers of 100 vehicles fitted with video and sensor devices for over a year. According to the study, secondary task involvement was defined as, “Driver behaviour that diverts attention away from the driving task; may include listening to cell phone, eating, talking to passenger, etc”. The study results indicated that, secondary task distraction contributed to over 30% of all the crashes and over 25% of near crashes while 80% of crashes involved some form of driver inattention within 3 seconds of the event. According to the study carried by AAA foundation, (AAA foundation 2008) dialing a hand-held device was associated with nearly triple the odds of being involved in a crash or near-crash, and talking or listening to a hand-held device was associated with about a 30% increase in the odds of being involved in a crash or near-crash.
A cross-sectional study carried out by Leena and Rauno (2012), by posting the questionnaire to the drivers. It was found altogether 13.7% of respondents had close call situations and 2.4% had accidents at leisure, in which the mobile phone had a partial effect, and at work the amounts were 4.5% and 0.4% respectively, during the last 12 months. Similar study was carried by Dong-chul and Mohammad (2004) also used the set of questionnaires method to examine the association between in-vehicle cell-phone use and accidents or near-accidents and the result showed was more alarming that 21% of those who reported accidents and near-accidents involved at least one driver's using a cell phone. Current data suggested each year at least 1.6 million traffic accidents (28% of all crashes) in the United States are caused by drivers talking on cell phones or texting (Amy 2010). While, the study performed by Regan et al (2008) found between 15%-20% of all distractions appear to involve driver interaction with technology.

In-spite of driver uses his/her cell phone for having a conversation while driving. The phones of today can do more than ever before. It was not simply a device to talk to a colleague or a friend, it was a device which can connect you worldwide via different applications such as the social media websites like Facebook and Twitter, as well as the Internet and they are few studies or surveys carried out to determine the effect of using Internet while driving. A survey carried out by State farm insurance company, and Harris Interactive/HealthDay of U.S., found 19% and 13% of drivers accessed the Internet on a smart phone while driving (Automotive Fleet 2011) respectively. In a new survey carried out by Harper (2011) for the drivers age between 18-29 found that use of mobile web services was increased dramatically over the last two years, driver who access the internet while on a cell phone while driving increased from 29 percent in 2009 to 43 percent in 2011 while reading social media networks like facebook, twitter while driving increased from 21 percent in 2009 to 37 percent in 2011 while updating in social media sites while driving increased from 20 percent in 2009 to 33 percent in 2011.
3.2 OBJECTIVE

The major objective of this study is to investigate the percentage of drivers who met with an accident due to usage of mobile phone while on the wheel in India. Although extensive research has been carried out regarding this in various countries like U.S., Netherlands, Australia etc., but till now, no data or study has been carried out to determine the number of accident due to mobile phone uses either for talking or surfing the internet while driving in India reported by Indian Institute of Technology (IIT), Chennai.

3.2.1 Participate and Procedure

To study the risk associated with the usage of the mobile phones while driving, a set of questionnaires were asked to the drivers by interview or through an online survey containing the same set of questionnaires. Participants in the study were from a purposive sample of college students drawn from various colleges and working professionals with their age between 21 and 30 and all of them having driving license of their own. At the time of creating this report, from the total sample of 950 targeted, and received a complete response from 843 participants, giving a response rate of 88.7% by the motor vehicle drivers. Nearly, 107 responses are excluded due to inconsistent or half filled. There by leaving only 843 usable questionnaires with valid and sufficient responses. In this study, it has not taken into account a few parameters like Sex, Marital status, Education, etc., Since this study mainly focuses on percentage of road accidents occur due to cell phone use, willingness of drivers who support cell phone ban or development of new technology in order to use phones only in emergency.

In addition to certain questionnaires not considered in this report, participants were asked the following important questionnaires. The complete list of questionnaires can be found in Appendix 2.
1. Have you ever used your Mobile phone while driving (Yes/No)?

2. Have you ever met with an accident by using a mobile phone while driving (Yes/No)?

3. According to you, which of the following was considered as a most distraction or risk to the driver while driving?
   a) Drunk and Drive b) Smoking c) Talking to passenger d) Cell phones e) Applying makeup.

4. What extent do you think, the use of mobile phone while driving should be restricted for safety reasons?
   a) Total banning b) No Restrictions c) Technology should be developed in such a way that drivers can attend emergency call only when he parks the vehicle in a safe place

3.2.2 Results and Discussions

The results show that there is an exceptionally high level of a mobile phone use by the drivers while driving. Overall, about 784 (93%) drivers agreed to the use of mobile phone while driving, whereas only 59 (7%) reported they never use their mobile phones while driving for any other purposes. This is higher when compared to the studies carried out by White et al (2009), Walker et al (2006), Olukoga et al (2011) which found use of a mobile phone by the drivers while driving, such as in London (2.5%), Spain (60.1%), West indies (91%), Australia (77%) and Finland (81%). All the above mentioned countries have imposed ban on using cell phones while driving but still the number of drivers using the cell phone while driving has
been increasing. This result could be fact of not implementing legislation strictly on mobile phone use properly. 750 drivers (89%) identified that using a mobile phone while driving increases the chances of met with an accident.

The study also tries to determine the most distracted activity from the driver’s point of view, either a drunk and drive or smoking or talking to the passenger or cell phone or applying makeup by asking the drivers to rank the most distracted activity first to the least. The study results shows, 69% believes drunk and drive, 33% believes smoking, 58% believes talking to passenger, 78% believes cell phone usage and 9% goes for applying makeup's as the most distracted to the driver. Therefore, cell phone use (to answer or making a call and using the internet) is the most distracted in-vehicle technologies among drivers as shown in Figure 3.1. This finding is in agreement with the study carried out by Grabowski and Goodman (2004) which concludes as, cell phone/electronics is the leading distracter, apart from eating/drinking/smoking, reaching/looking behind, grooming, and reading.

![Figure 3.1 Driver’s Most Distraction Activity](image-url)
In this study nearly 528 (63%) of drivers use hand-held mobile phone while, 315 (37%) uses hand-free mobile phone while driving. 700 (83%) of drivers agreed that they use a cell phone for answering or making the call and 143 (17%) agreed that they use a cell phone for browse Internet while driving. Overall, 253 (30%) of drivers admitted that they have met with an accident as a result of using a cell phone. This is particularly alarming when compared with the results carried out by Governors Highway Safety Association (GHSA) and National Safety Council (NSC) of U.S., which estimate 25% and 28% of the drivers who use a cell phone while driving has met with an accident respectively. A survey carried by Seo and Torabi (2004) in 2004 revealed that, 21% of crashes or near crashes reported by respondents involved at least one driver using a mobile phone. While the study carried by Lissy (2000) in the year 2000 shows, about 6% of automobile accidents are caused by cell phone use. This phenomenal increase in the rate of accident within 11 years is mainly due to a rapid increase of cell phone subscribers around the globe and the willingness of users to adopt the technology.

From the 253 (30%) of driver met with an accident due to the cell phone use nearly 135 (16%) drivers have met with an accidents while using the hand-held phone and 118 (14%) of drivers have met with an accidents by using hand-free phones as shown in Figure 3.2. This finding clearly states that using a cell phone while driving regardless of the cell phone type used is unsafe. Since it’s only cognitive interference caused by the cell phone conversation caused these accidents as reported by McCartt et al (2006), McEvoy et al (2005), Strayer et al (2004).
Nearly 68% of calls made or received by the drivers in this study were personnel or general calls in nature while, 32% of calls were emergency calls. This is in agreement with the report about cell phone usage while driving in North Carolina carried by Stutts et al (2003), Stutts et al (2001). The report found, nearly 53% of the calls were personal and only 27% of the calls were work-related. In this study, almost all the users i.e., 784 (93%) of drivers who use a cell phone while driving say that they attend incoming calls assuming that it could be an emergency call. Though 750 (89%) of drivers know the risk of using cell phones while driving. Only 219(26%) recommends for banning the cell phone from use. While, 624(74%) drivers indicated that instead of banning cell phones which some time include life-saving emergency calls, advanced technology should be developed to restrict the driver from using a mobile phone with provision provided to make or a receive call only when the vehicle is stopped. Nearly 599(71%) drivers admitted that they would drive fast (Rash Drive) if mobile communication are entirely blocked inside the vehicle by using technologies like mobile jammers or the mobile applications which will block the cell phone when vehicle’s in motion is detected. The summary of this complete study is shown in Figure 3.3.
3.3 SUMMARY

This chapter reviewed number of the survey carried out in various countries like the U.S.A., the U.K., Taiwan, West Indies etc., to study the percentage of mobile phone users involved in road crashes. This chapter gives the findings carried out in India which is accounted for 30% of road crashes due to cell phone usage. From the above study, it is apparent that though drivers are knowledgeable with regards to the risks associated with usage of mobile phone while driving, they are still unwilling to give up the habit. Unless effective technology is developed which can provides the option to attend emergency calls by ensuring the safety of the drivers, the number of accidents will continues to grow.