Road Safety and Mobile Phone Behaviors

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INTRODUCTION

Mobile phone use while using roads includes any manipulation of cell phone by an individual using the road as a driver, rider or while walking. Specifically, the manipulations can be reaching a phone, conversing on the phone or any use of the phone's interface such as dialing a call, texting or accessing the internet.

OVERVIEW

Mobile phone use while driving, riding or walking is a frequent road behavior involved in motor vehicle collisions (Centers for Disease & Prevention, 2013; World Health Organization, 2011), which are the leading cause of mortality and hospitalization around the globe (Mathers & Loncar, 2006). According to the National Safety Council, mobile phone use while driving is suspected in slightly more than a quarter of the motor vehicle collisions in the United States (US) (National Safety Council, 2010). The costs of mobile phone use-related collisions to the US economy lie somewhere between 12 and 43 billion US$ in 2003 (Cohen & Graham, 2003). Though mobile phone use during walking or riding has been shown to increase motor vehicle collision risks, the focus of the available literature until very recently had been its use by drivers and subsequent collision risks (World Health Organization, 2011). This article, therefore, summarizes the literature on the effects of mobile phone use on driving behavior and road safety.

Current Knowledge in Mobile Phone Use while Driving

The article is divided into four sections describing the trends of mobile phone use while driving, its effects on driving capacities the motor vehicle collision and injury risks, and the interventions to tackle this road safety menace. Of note, Dr. Redelmeier (Redelmeier & Tibshirani, 1997) at the University of Toronto and Dr. Violanti (Violanti, 1997, 1998) at the Rochester Institute of Technology, New York were among the earliest scientists demonstrating that mobile phone use posed a significant threat to road safety by using vehicle collision data. Currently, Dr. Caird (Caird et al., 2008; Caird et al. 2014) at the University of Calgary and Dr. McCartt (McCartt et al., 2006; McCartt et al. 2013) at the Institute of Highway Safety are authority in this subject as both have published influential reviews on different aspects of mobile phone use while driving.

Trends of Mobile Phone Use while Driving

Mobile phones are now an essential part of the dress code in this global village. The mobile phone subscriptions have skyrocketed in the last 15 years or so (International Telecommunications Union, 2014). This has been discussed in detail elsewhere in this encyclopedia, but a relevant summary is provided here to set the context. The global mobile phone subscription which was about 16% in 2001 has reached the levels of

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96% in 2013 (International Telecommunications Union, 2014). Similarly, the type of usage has also changed and with more smartphones, the use of mobile phone accessing internet have also increased. For example, in the United States three out of five persons are using smartphones (Pew Research Center, 2014). Other measures of how the mobile phones are influencing our lifestyle include the time spent on the mobile phone and the types of usage. Scientific investigations into such practices are rare, but market surveys with variable methodology do provide useful insights. According to a survey by the Nielsen Company©, the United States' residents spent nearly 34 hours on the phone in one month in 2014 (The Nielsen Company, 2014). This is higher than the time spent online (≈26hours), but less than the time spent on TV (≈185 hours). The most common activity is using social media (29% of the time) followed by playing games (18%) and accessing entertainment (15%). These market surveys also show that the daily mobile phone usage is continuously growing, and this encroachment of daily routine by mobile phone use translates into multi-tasking; which can result in lapses in concentration, errors, loss of sleep and mental stress, factor strongly associated with physical and mental harms (Becker, Alzahabi, & Hopwood, 2013; Weksler & Weksler, 2012).

More mobile phone subscriptions have led to the rise of its use while driving, in particularly in motorized countries (World Health Organization, 2011). Ascertaining of its use however is fraught with challenges (McCartt, Hellinga, & Bratiman, 2006). Self-reported surveys, which are used by many jurisdictions, are subject to bias based on who were surveyed and whether they accurately reported their behaviors. These limitations could be overcome by on-road observational studies. This method, however, yields only time-limited findings because of the ever changing trends of mobile phone use (Eby, Vivoda, & St Louis, 2006). Another way to ascertain cell phone use while driving is by auditing traffic tickets for mobile phones use but this is only possible in jurisdictions where the use is prohibited by the traffic law (Li et al., 2011). Estimations from this method can be biased by enforcement practices (Walter, 2009). Ascertaining the use of a hands-free device by direct observations is another challenge in estimating mobile phone use effects. Other limitations are the survey conditions as most are conducted during daylight hours. Mobile phone use while driving may increase during nighttime, when drivers' perception of being caught is lower than the levels of perception during daylight (Regan, 2007). Moreover, only few low and middle-income countries regularly monitor driving behaviors including mobile phone use thought the overall mobile phone use has increased (World Health Organization, 2013). All these have resulted in the variability in the rates of mobile phone use while driving reported in different settings (McCartt, Hellinga, & Bratiman, 2006).

Overall, the rates of mobile phone use while driving during daylight hours in high-income motorized countries range from 1% to 11% (World Health Organization, 2011). Rates as low as ≈1-2% were observed in the United Kingdom (Johal, Napier, Britt-Compton, & Marshall, 2005) whereas a higher rate (11%) was observed in the United States (Insurance Institute for Highway Safety (IIHS), 2010). Repeated surveys and motor vehicle collision audits point out that both use and its involvement in a collision are on the rise. For instance, in the United States, the rates of mobile phone use while driving doubled from 2.7% in 2001 to 5.8% in 2005 in the police-reports of vehicle collisions (Eby et al., 2006). Several other factors also influenced the observed rates of mobile phone use. An on-road investigation from the United Kingdom showed that drivers under the age of 30 years were more likely to use mobile phone while driving than other age groups (Transport Research Laboratory, 2008). Some scientific evidence also points out that professional activity might be indirectly associated with mobile phone use while driving (Bhatti et al. 2008). Drivers queried via telephone or post reported a higher use than the observed rates. In most surveys the range of mobile phone use