Knowledge, Prevalence and Risk Factors of Violating Traffic Rules Among Adult Population - A Survey

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Abstract: Road traffic injuries are one of the most important leading causes of death and disability in many of the developed and developing countries. Road accidents are major public health problems faced by the society. The crash can be defined as an incident or collision which may or may not lead to injury, occurring on a public road and involving at least one moving vehicle. In a developing country like India with a dense population there is a need to check the awareness level among the public about traffic signals and rules among the adult population, this survey was carried out. To check the awareness level among the adolescents population a questionnaire containing 10 questions was prepared. This survey was carried between the month of June 2019 to March 2020 among the adult population living in Chennai. This survey was conducted in an online platform where the participants responded to their answers. Finally the results were analysed and tabulated. Around 85% had knowledge and awareness of violating traffic signals and rules and suggested the need for having awareness camps to be organised by NGOs/Traffic Police/Government to create awareness among the public to obey traffic rules and 15% had no idea. The survey participants had moderate knowledge about road traffic regulations and most of them mentioned that prime speed, drivers lack of awareness about traffic regulation and laws, and drivers non-compliance with traffic rules and regulation were the foremost important explanation for road traffic accidents

Key words: Awareness, Traffic rules, road accidents, traffic rule violation, risk factors.

INTRODUCTION

Road Traffic injuries are one of the most important leading causes of death and disability in many of the developed and developing countries. Road traffic injuries are major public health problems faced by the society (Krug, Sharma and Lozano, 2000; Nantulya and Reich, 2002; Hatamabadi *et al.*, 2011; Tajvar *et al.*, 2015). The crash can be defined as an incident or collision which may or may not lead to injury, occurring on a public road and involving at least one moving vehicle (World Health Organization. Dept. of Violence and Injury Prevention and Disability, World Health Organization. Violence and Injury Prevention and World Health Organization, 2009). Each and every year, more than 20 million people were injured or crippled and 1.17 million die due to road traffic accidents (Binder, 2004; Peden, 2004; Murray, Lopez and Mathers, 2009). It is depicted that the road traffic accident rate all over the world could increase by 50% by the end of 2020 if appropriate actions are not taken to reduce global deaths due to road traffic accidents (Bahadorimonfared *et al.*, 2013). Traffic accidents are the leading cause of death among young people aged 15–29 years in industrialized countries like India, China, etc(Bahadorimonfared *et al.*, 2013; Ocde and OCDE, 2015). Accidents including young drivers aged below 25 years typically represented about a quarter of all deaths on the road (Geuna, Ravazzani and Perassi, 1995).

Humans, vehicles and environmental factors play an important role before, during and after the accident event. Human error is estimated to account for between 64%-95% of all causes of traffic crashes in developing countries like India, China, etc(Mercer *et al.*, 1997) . Reported from developed nations indicated that the use of seat belts while travelling in four wheelers is one of the most effective ways to reduce road accident fatalities(Green *et al.*, 1994). Other studies had shown that when a road accident occurs, the use of the seat belt prevents certain types of injuries to vehicle occupants or mitigates their severity(Arajärvi, 1988; Campbell, Stewart and Reinfurt, 1991; Evans, 1996). Safety seat belts and helmets are preventive measures from mortality because they restrain the body within the original posi-tion to a seat which has proved to scale back the danger of fatal injury to front-seat passengers by 45% and therefore the risk of moderate to critical injury by 50%. Wearing a seat belt while driving a four wheeler also helps the driver to control the vehicle in a crash situation

as it holds the passenger in place. Serious injuries occurring to passengers in motor vehicles ve-hicles are often caused by people being thrown into each other during a crash (Shibata and Fukuda, 1994). If an individual doesn't wear the safety belt , that specific person might be thrown from his or her vehicle; through the windshield or door into trees, telephone poles or rocks, or run over by their own or someone else's car. one more reason for road traffic accidents is using handheld mobile telephone while driving [18]. There is increasing evidence that the use of a handheld mobile telephone while driving a motor vehicle increases the risk of a traffic accident(Violanti, 1997, 1998; Lamble *et al.*, 1999).

Previously our team had conducted numerous survey studies (Sriram, Thenmozhi and Yuvaraj, 2015), (Thejeswar and Thenmozhi, 2015), in vivo laboratory animal studies[23] (Seppan *et al.*, 2018), in silico studies (Johnson *et al.*, 2020), morphological studies (Subashri and Thenmozhi, 2016; Nandhini *et al.*, 2018), (Nandhini *et al.*, 2018), in vitro studies (Sekar *et al.*, 2019), over the past 5 years. Now we are focusing on epidemiological surveys and related researches. The idea for this survey stemmed from the current interest in our community and to create awareness and to knowledge the people to lead a safe and secure life.

In a developing country like India with a dense population there is a need to check the awareness level among the public about traffic signals and rules among the adult population. The aim of the present study was to analyse the knowledge on traffic rules, thereby to create awareness and to educate the people on the consequences of violating traffic rules and its underlying risk factors. Our team has rich experience in research and we have collaborated with numerous authors over various topics in the past decade (Deogade, Gupta and Ariga, 2018; Ezhilarasan, 2018; Ezhilarasan, Sokal and Najimi, 2018; Jeevanandan and Govindaraju, 2018; J *et al.*, 2018; Menon *et al.*, 2018; Prabakar *et al.*, 2018; Rajeshkumar *et al.*, 2018, 2019; Vishnu Prasad *et al.*, 2018; Wahab *et al.*, 2018; Dua *et al.*, 2019; Duraisamy *et al.*, 2019; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Gheena and Ezhilarasan, 2019; Malli Sureshbabu *et al.*, 2019; Mehta *et al.*, 2019; Panchal, Jeevanandan and Subramanian, 2019; Rajendran *et al.*, 2019; Ramakrishnan, Dhanalakshmi and Subramanian, 2019; Sharma *et al.*, 2019; Varghese, Ramesh and Veeraiyan, 2019; Gomathi *et al.*, 2020; Samuel, Acharya and Rao, 2020)

MATERIALS AND METHODS:

This cross sectional survey was carried in between the month of June 2019 - March 2020. To check the awareness level among the adult population a questionnaire containing 15 questions was prepared. For this survey we got approval from the Institutional Ethical Review Board. This survey was carried between the month of June 2019 to March 2020 among the adult population living in Chennai,Tamil Nadu, India. This survey was carried under an online platform where the participants responded to their answers. Around 300 participants aged between 10-50 years participated in the survey. Simple randomised sampling method was used to categories the sample population (online survey participants). 300 participants who had the ability to give informed consent, aged between 10-50 years who had the ability to read and understand english were included to participate in the survey. In order to reduce multiple attempts of single participants, demographic details of participants including name, age, gender , occupation, and email id was made mandatory to mention by participants before starting the survey. Based on their response, data were tabulated in excel sheets. Excel tabulated data was transferred to SPSS software version 26.0 for software analysis. Statistical tests used in software analysis where participants age and gender are mentioned as independent variables , Knowledge, educational status were listed under dependent variables. Based on analysis results were tabulated.

RESULTS AND DISCUSSION

In this study we observed the awareness level about the traffic rules among the adult population- South India. We got 100% response from participants. Around 70% of participants were male and 30% were female (Figure 1). Among the participants 80% had a driving licence and 20% didn't have a driving licence (Figure 2). Around 60% had driving experience of 2-10 years, 30% had <2 years and 10 had experience of >10 years (Figure 3). Almost 70% who participated in the survey had a light vehicle driving licence, 20% didn't have a driving license and 10% had a heavy duty licence (Figure 4). Figure 4 shows the percentage distribution of responses where 45% of the population obey traffic rules to an extent, 35% strictly obey traffic rules and 20% does not obey traffic rules. Figure 6 shows around 35% always obey traffic rules,30% obey traffic rules only in presence of police personnel, 25% obey in presence of CCTV cameras and 10% obey due to some other reasons. According to figure 7 around 60% wear seat belts/ helmets while driving, 35% responded that they wear seat belts/ helmets while driving not always and the remaining 5% don't care to wear seat belts/ helmets while driving. Figure 8 shows that around 60% not always obey signals, speed limit mentioned,while driving in National Highways, 30% obey signals, speed limit mentioned,while driving in National Highways and 10% does not obey signals, speed limit mentioned,while driving in National Highways. According to figure 9 85% of the participants follow a gap of 10meters with approaching vehicle while driving in Highway and 15% does not gap of 10meters with approaching vehicle while driving in Highway. Around 60% do not use cell phones while driving and remaining 40% use cell phones unknowingly while driving (Figure 10). 85% of participants suggested awareness camps to be organised by NGOs/Traffic Police/ Government to create awareness among

the public to obey traffic rules and 15% had no idea (Figure 11). Figure 12 shows association between gender and awareness camps to be organised by NGOs/Traffic Police/ Government to create awareness among the public to obey traffic rules where 61% males and 24% female suggested awareness camps to be organised by NGOs/Traffic Police/ Government to create awareness among the public to obey traffic rules, 9% males and 6% females had no idea. p value is 0.000 (<0.05) which is statistically significant.

It is generally accepted that vehicle crashes and accidents cannot be prevented completely, and occurs unknowingly but that some of the injuries and severity can be prevented or minimized by simple protective ways such as using seat belts for car users. Many factors are the causes of road traffic accidents: car conditions, driver attitude, drivers distraction and the road conditions. The objective of this study was to determine the knowledge, awareness level among the public about traffic signals and rules among the adult population, so this survey was carried out. Around 80% of the participants had driving licenses and 20% didn't have driving licenses. This is in relation with Ahmed NR etal where 50% had a driving license (Ahamad and Ariffin, 2018). 45% obey traffic rules to an extent this result coincides with Al Khaldi YM etal where 52% obey traffic rules to an extent (Al-Khaldi, 2013). 35% wear seat belts/ helmets to an extent and not always. The findings of many studies have shown that wearing a seat belt may decrease the risk and severity of injuries. Mehri et al. demonstrated that the rate of using seat belts among Iranian drivers was very low. Although most of the drivers in their study (88%) were aware of the effectiveness and benefits of wearing a seat belt in decreasing the severity of injuries in traffic crashes, only 63% of them actually wore a seat belt while driving (Ali et al., 2011). The data suggests that about 40% of people use cell phones while driving this is in relation with several studies Young KL et al states 60% used mobile phones while driving, and one-third of them used their phone in the hand-held mode (Young and Lenné, 2010). Also, the results of some studies indicated that talking on a cell phone may increase the risks of traffic accidents (Strayer, Drews and Crouch, 2006). The increase in knowledge, attitudes, towards traffic regulations among the adult population may decrease the rate of traffic injuries and deaths. Implementation of effective awareness programs may increase the knowledge, attitudes, and practices towards traffic rules and regulations. A limitation of this study was that the relationships between the knowledge, attitudes, and prevalence towards traffic rules and regulations and traffic crashes were not examined. Further experimental investigations are needed to estimate the relationships between these factors.Our institution is passionate about high quality evidence based research and has excelled in various fields ((Pc, Marimuthu and Devadoss, 2018; Ramesh et al., 2018; Vijayashree Priyadharsini, Smiline Girija and Paramasivam, 2018; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Ramadurai et al., 2019; Sridharan et al., 2019; Vijayashree Priyadharsini, 2019; Chandrasekar et al., 2020; Mathew et al., 2020; R et al., 2020; Samuel, 2021)

CONCLUSION
The survey participants had moderate knowledge about road traffic regulations and most of them mentioned that high speed, drivers' lack of awareness about traffic regulation and laws, and drivers' non-compliance with traffic rules and regulation were the most important cause of road traffic accidents. Almost all students were very strongly/strongly convinced of seat-belt importance. Age and attitude were significantly associated with the exposure to the road accident.

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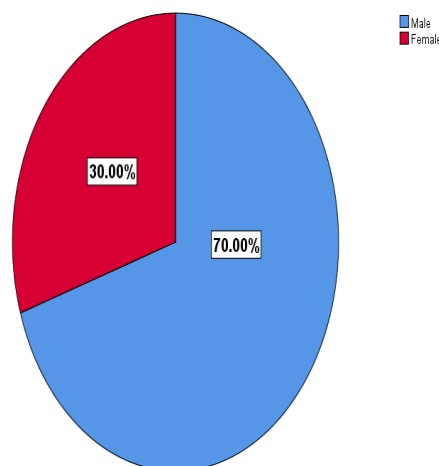
Fig.1: Pie chart showing percentage distribution Gender of participants participated in the Survey. 70% of participants were male and 30% were female. Male participants were more in the study.
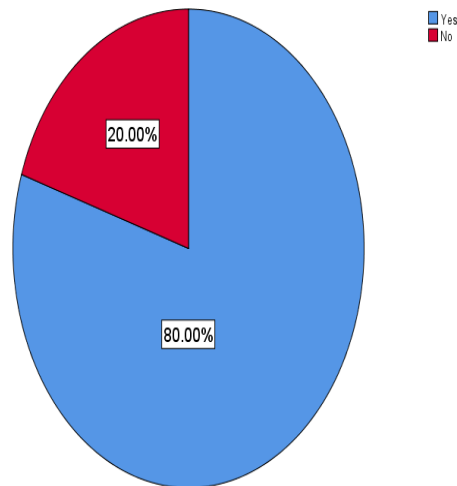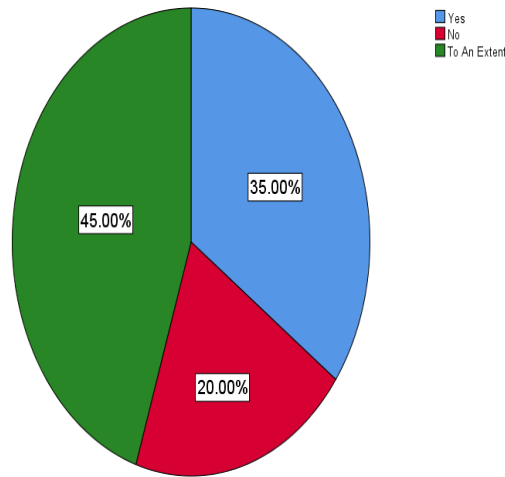
Fig.2: Pie chart shows the percentage of responses of people who have a driving license. Among the responses 80% of participants have a driving license and 20% don't have a driving license. Majority of participants have their driving license.
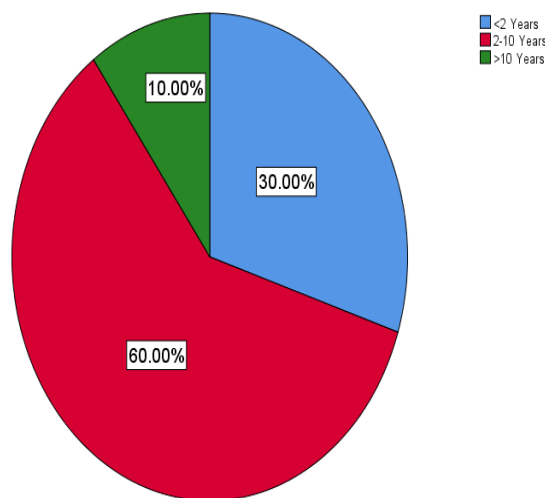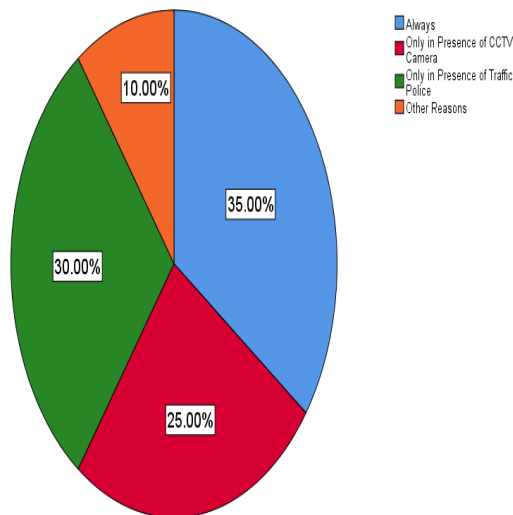

Fig.3: Pie chart shows the percentage of responses of people's driving experience. 30% of participants have a driving experience of less than 2 years, 60% have 2-10 years of driving experience and 10% have more than 10 years of driving experience. People with 2-10 years of driving experience are more in the study.
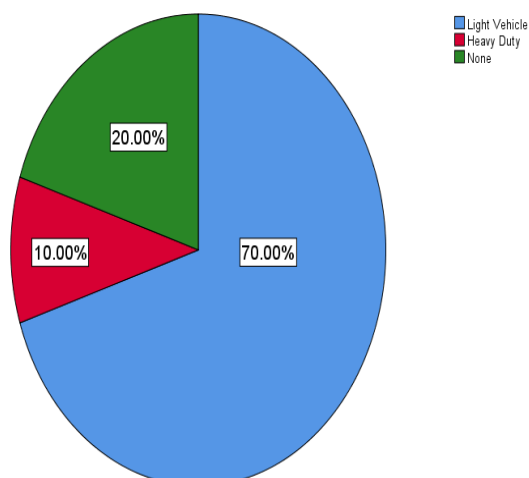
Fig.4: Pie chart shows the percentage of responses of people having the type of driving license. 70% have light vehicle license, 10% have heavy motor vehicle license and 20% don't have any license. Participants with light motor vehicle licenses are more in the survey study.

Fig.5: Pie chart shows the percentage of responses of people who obey traffic rules. 35% of participants obey traffic rules, 20% don't obey and 45% obey traffic rules to some extent. Participants who obey traffic rules to some extent based on circumstances are more in the study.
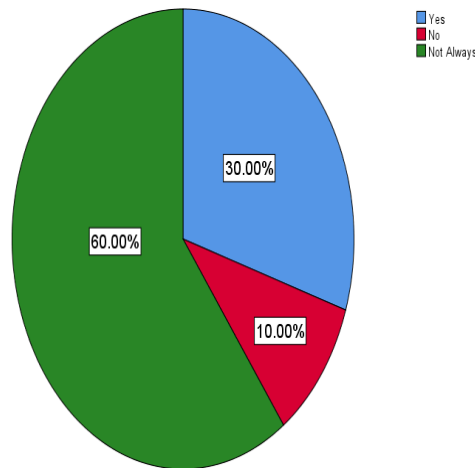

Fig.6: Pie chart shows the percentage of responses of people when they obey traffic rules. 35% of participants obey traffic rules always, 25% obey only in presence of CCTV cameras, 30% obey only in presence of Traffic police and 10% of participants responded other minor reasons.
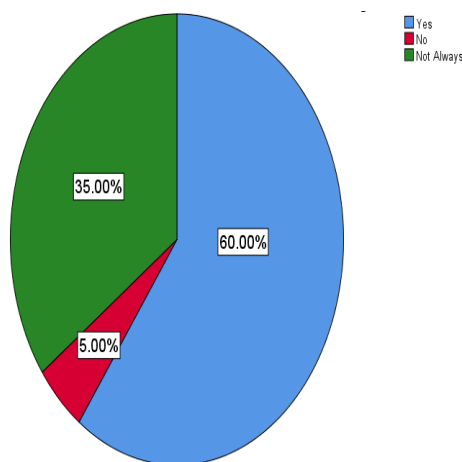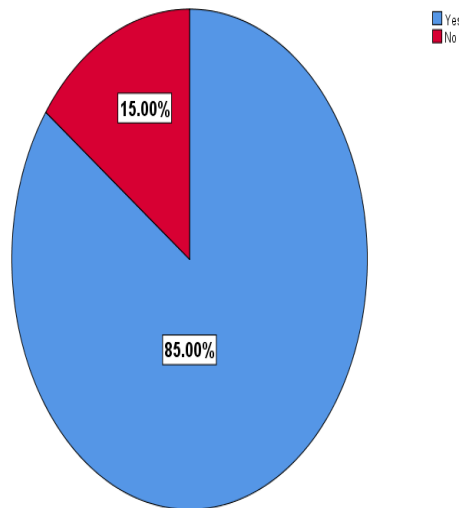

Fig.7: Pie chart shows the percentage of responses of people who use seat belts/helmets while driving. 60% of participants use seat belts/helmets, 5% don't use seat belts/helmets and 35% responded as they use seat belts/helmets not always.
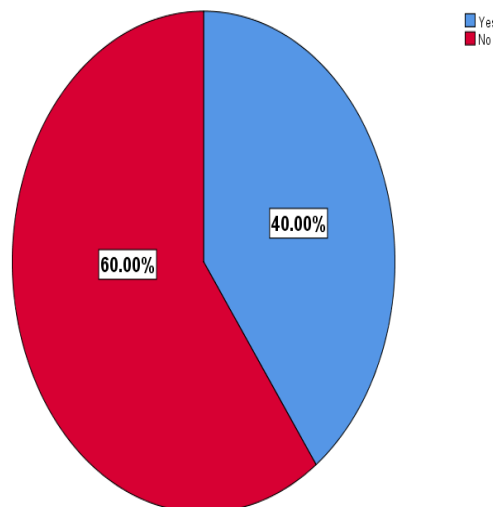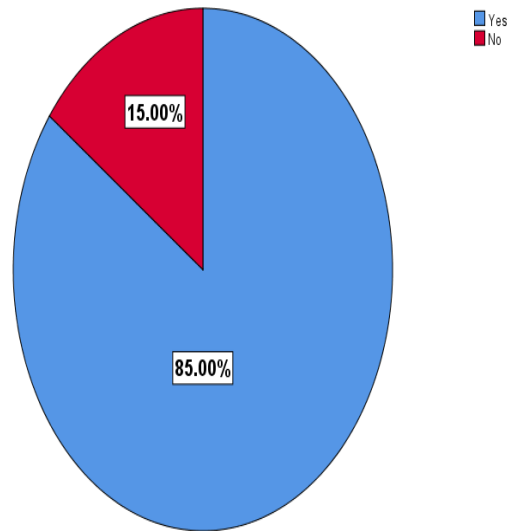
Fig.8: Pie chart shows the percentage of responses of people who follow signals, speed limit mentioned while driving on national highways. 30% of participants responded 'yes', 10% of participants responded 'no' and 60% of participants responded as 'not always'.


Fig.9: Pie chart shows the percentage of responses of people who follow a 10 meters gap with other vehicles while driving. 85% of participants responded 'yes' and 15% responded 'no'. Most participants follow the rule of 10 meters gap with other vehicles while driving.

Fig.10: Pie chart shows the percentage of responses of people who use mobile phones while driving. 40% of participants responded 'yes' and 60% of participants responded 'no'. 40% of participants use mobile phones while driving.

Fig.11: Pie chart shows the percentage of responses of people who suggested NGOs/Police to organise awareness camps among the public to create awareness about traffic rules. 85% of participants suggested 'yes' and 15% of participants responded 'no' for organising awareness camps among the public to create awareness about traffic rules.
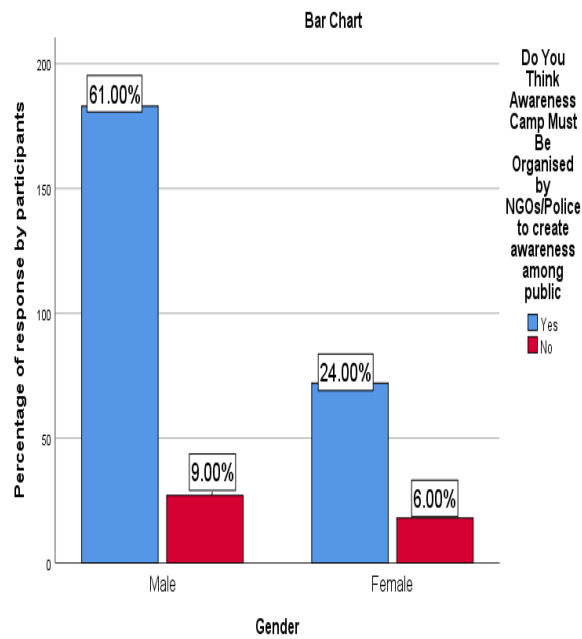
Fig.12: Bar graph showing association between gender and responses about camps to create awareness among the public to obey traffic rules organised by NGOs/Traffic Police/Government. X axis represents gender and the y axis represents the percentage of responses. 61% males and 24% female suggested awareness camps to be organised by NGOs/Traffic Police/ Government to create awareness among the public to obey traffic rules, 9% males and 6% females had no idea. This shows that there was a difference in the percentage of responses between the genders and was statistically significant. Chi square test showed p=0.000 (p<0.05) indicated statistically significant proving there was an association between gender and percentage of responses about camps to create awareness among the public to obey traffic rules.