

**EXPLORING ROAD TRAFFIC ACCIDENT AWARENESS AND BASIC
MANAGEMENT AMONG TAMIL NADU COLLEGE STUDENTS: A JOURNEY
THROUGH DESIGN THINKING**

Vishnu Priya V¹, Preetha G², Prabakaran V³, Krishnaveni P⁴, Swarnam S⁵, Senthil Kumar S⁶, Shamini SD⁷ & Archana K⁸

¹Assistant Professor, Department of Management Studies, SNS College of Technology, Coimbatore.

²Assistant Professor, Department of Management Studies, SNS College of Technology, Coimbatore.

³Associate Professor, Department of Management Studies, SNS College of Technology, Coimbatore.

⁴Professor, Department of Management Studies, SNS College of Technology, Coimbatore.

⁵Assistant Professor, Department of Management Studies, SNS College of Technology, Coimbatore.

⁶Assistant Professor, Department of Management Studies, SNS College of Technology, Coimbatore.

⁷Assistant Professor, Department of Management Studies, SNS College of Technology, Coimbatore.

⁸Assistant Professor, Department of Management Studies, SNS College of Technology, Coimbatore.

ABSTRACT:

This descriptive study aims to assess the knowledge and awareness of road safety among college students. The study was conducted among students in Tamil Nadu by means of questionnaire disseminated online via social media with shareable link to a Google form. The respondents were self-selected to participate in this study where their responses were self-administrated. Questionnaire consisted of 3 sections included demographic information, knowledge on road signs and road safety law, and road safety awareness. 371 students participated in this study, 66% of them age 23 to 27 years old, 61% were female, 92.5% of respondents have at least one type of license with majority agreed that occurrence of accidents resulted in an increase in road safety awareness. The study found that more than half of the participants could not recognise road sign like parking totally prohibited and speed limit ends here. While, 38% of them correctly identified posted speed limit for expressway. Overall, participants have fair understanding on road safety. Therefore, road safety programmes and education are still relevant to the college students as young drivers on the road which is important to increase safety awareness.

KEYWORDS: *Road Safety, Awareness, Knowledge, College Students, Safety Sign*

INTRODUCTION

In today's world, the spotlight shines brightly on 'Road Safety' as a critical concern within the realm of public health. It casts a pervasive shadow over our society, stirring a call to action. Yearly,

countless lives fall victim to the harsh reality of road accidents, urging us to take swift measures. Underestimating the importance of road safety is not an option if we are to achieve sustainable development, prosperity, and progress. It stands as a foundation for a content, healthy, and thriving life, both for individuals and our nation as a whole.

This concern touches the lives of all road users like pedestrians navigating bustling streets, motorcyclists weaving through urban thoroughfares, and motorists navigating a complex network of roads. The rapid expansion of motorization and road networks intensifies travel risks and exposes us to the unpredictability of traffic. The surge in registered vehicles surpasses population growth and road construction, underscoring the urgency of the issue. In today's era, road traffic accidents contribute significantly to fatalities, disabilities, and hospitalizations on a global scale. This grim reality calls for innovative solutions to shape safer roads and protect lives.

The latest report on 'Road Accidents in India 2021' paints a stark picture: a staggering 4,12,432 road accidents in the previous year, claiming the lives of 1,53,972 individuals and leaving 3,84,448 injured (Parashar, 2022). These statistics underscore the pressing need for concerted efforts to address road safety. India is steadfast in its commitment to reducing road accident fatalities, requiring a comprehensive approach involving various stakeholders.

As the pages of the year 2022 unfolded, a chilling reality came into focus: a staggering 1,55,622 lives were lost on the stage of road accidents in India, as meticulously documented within the report by (Parashar, 2022). A significant 59.7% of these incidents were a direct consequence of over-speeding - a stark and potent reminder of the urgency that underscores the need for immediate action. Further intensifying the gravity of the situation, a mere 5% stretch of highways bore witness to a staggering 62% of these accidents, an undeniable testament to the necessity of targeted interventions.

To address this disconcerting trend, a multi-pronged approach is imperative. This includes a comprehensive reevaluation of speed limits along high-risk corridors, enforcing stringent parameters to curtail the peril of reckless velocities. In addition, addressing blind spots that mar these routes emerges as a pivotal measure, enhancing visibility and acting as a guardian against potential collisions, sparing invaluable lives from the clutches of tragedy. Another significant facet is the treacherous undulations that often mar the roadways. Rectifying these irregularities or employing cutting-edge engineering solutions can significantly diminish the risk of accidents, thereby chiseling a safer passage for all.

In summation, it becomes evident that a multifaceted and cohesive approach is not only advisable but obligatory in the battle against the harrowing toll of road accidents. Through the strategic implementation of these proactive measures, a future marked by safer highways and fewer lives lost to the devastating consequences of negligent driving comes within our grasp, promising a

horizon where lives are treasured and the harrowing consequences of recklessness are largely mitigated.

At the heart of this study lies the aspiration to gauge the level of road traffic accident awareness and the basic management protocols within the vibrant and diverse student community of Tamil Nadu. The journey embarked upon is unique, guided by the compass of Design Thinking, which steers the exploration toward heightened awareness and paves a transformative path toward safer road journeys across the expansive terrain of Tamil Nadu.

DESIGN THINKING

Design thinking is a holistic approach to innovation centered around understanding and solving real-world problems in a creative and user-focused manner. It involves a series of interconnected steps that guide teams in developing effective solutions:

Empathize:

In this phase, the focus is on gaining a deep understanding of users' needs and experiences. Techniques like user interviews, observation, and empathy mapping help gather valuable insights into users' thoughts, feelings, and behaviors.

Define:

Here, the problem is framed based on the insights gained during the empathy phase. This involves crafting a clear problem statement from the user's perspective and distilling it into a concise Point of View (POV) statement.

Ideate:

Brainstorming sessions foster the generation of diverse ideas. The goal is to encourage innovative thinking and explore various possibilities. Techniques like crazy 8s, SCAMPER, and storyboarding help unleash creativity.

Prototype:

Prototyping involves creating tangible representations of potential solutions. This can range from rough sketches to digital mock-ups, allowing teams to visualize and test ideas quickly and inexpensively.

Test:

Solutions are tested with real users to gather feedback and insights. Usability testing, A/B testing, and ongoing feedback loops provide valuable data to refine and improve the prototypes.

Further, it is an iterative process which involves implement on every stage, evaluate the progress and modify till the objective is reached. Throughout the design thinking process, teams are

encouraged to embrace a mindset of experimentation, collaboration, and adaptability. The iterative nature of design thinking allows for flexibility and responsiveness to evolving user needs. It's a dynamic approach that encourages learning and growth at every stage. This Design Thinking process is adapted in this study to assess the students' awareness level about road traffic, accidents and its causes, etc.

EMPATHY & DEFINE

To carry out the research work in the empathy stage, a structured questionnaire was used as a research instrument and collected the details from the students of Tamil Nadu. 371 students are randomly approached and collected the details using Google form as a method of data collection. The questionnaire covers various areas like demographic profile of the respondents, respondents' opinion about road accidents, type of traffic violation, accident prone zone / period, reasons for the accidents, etc. Further, previously published research works related to road accident, respondents' opinion, students' perception about road accidents are collected and presented in this chapter.

(Keerthana, Priya, & Gayathri, Awareness on Road Traffic Accidents Among College Students, 2021) given that the majority of road traffic accidents are caused by the younger generation, road traffic accidents are a global issue that should be taken into consideration. (Hossain, Maggi, Vezzulli, & Mahmud, 2021) investigated the social, demographic, economic, and other pertinent factors that affect how aware and knowledgeable road accident victims are about traffic laws. Seven characteristics, including gender, training experience, education, access to media, prior involvement in traffic accidents, living in metropolitan regions, and high-skilled jobs, were found to be statistically significant using probit model estimation. The findings indicated that victims with training experience, higher education, media access, and prior experience with traffic accidents are more aware of traffic accidents and have enough knowledge of traffic laws. Compared to victims who reside in cities or have high-skilled employment, those who work in low-skilled positions or in rural regions are less likely to be familiar with traffic laws. Additionally, men are probably more knowledgeable of RTAs than women.

Medical students' understanding and application of basic life support procedures and road safety protocol was examined, (Srivastava & Bhattacharya, 2019). According to the study, 48.67% of participants occasionally wore a helmet when riding. 9.43% of students acknowledged that they only use it to evade traffic enforcement. The majority of participants (94.33%) had a solid understanding of road traffic signals. A particularly vulnerable age group of drivers is that of teen drivers. Further, the study found that absence of basic life support training at induction may be the cause of this low knowledge. The general level of RTA and fundamental management understanding was relatively low.

The introduction of a helpline call system, such as Rescue 11222, through organizational sponsorship is one example of a suggested solution, (Dar, 2018). Another is the sharing of accident videos, images, or events on social media platforms in the proposed solution application. (Keerthana, Priya, & Gayathri, 2021) confirmed in his study that 97% of the college students are aware about traffic rules and the expected impact if it is violated. Further, suggested to conduct more awareness campaign, workshops, seminars at the institutional level towards road safety, safety measures, traffic rules, over speeding, etc.

RESEARCH OBJECTIVES

Based on the literature review, the present study defined its objectives as to assess the knowledge of road safety among the students from Tamil Nadu. Further, their level of practicing road safety rules is also assessed in this study.

RESULTS & DISCUSSION

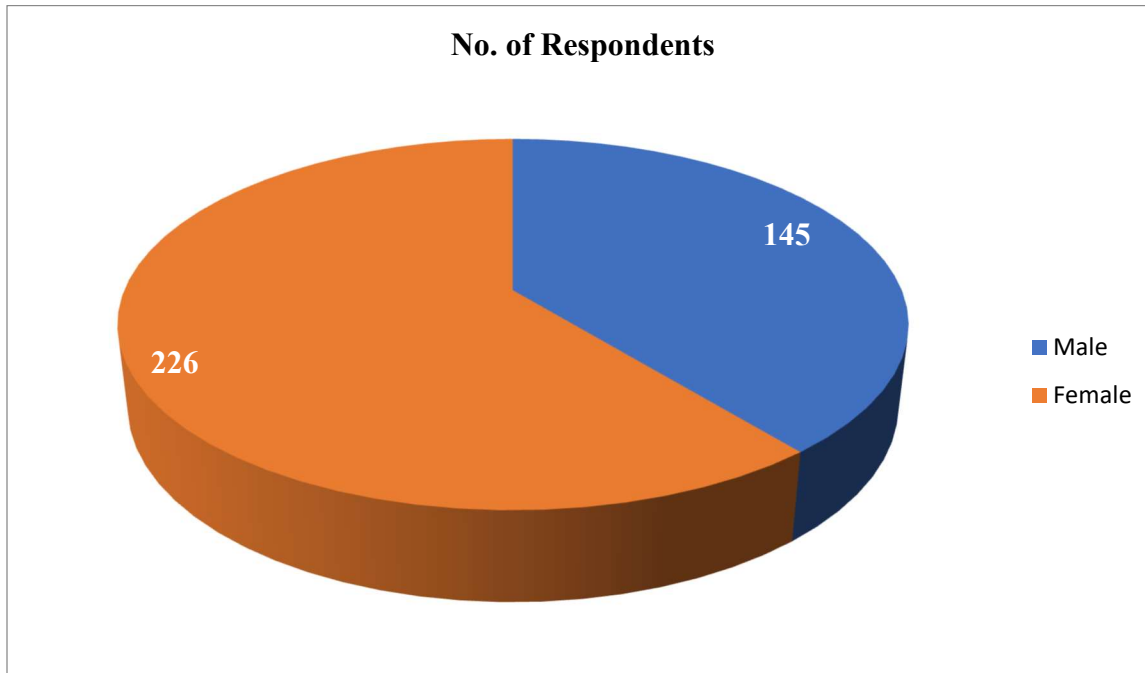
The pilot test result showed that the first batch of the questionnaire's standardized items had a Cronbach alpha of 0.5, which is insufficient. Subsequently, certain software-suggested changes were made to the questionnaire, such as the removal of a few pointless items to increase the Cronbach alpha significantly. Following that, a fresh questionnaire was distributed to students once more, and a follow-up pilot study was conducted. The reliability of the questionnaire was proven as the new Cronbach alpha was 0.79, and this number was sufficient. Following the reliability test's successful completion, the completed questionnaire was distributed until more than 400 responses were registered. Filtration procedures were used prior to results analysis to prevent processing of incorrect questionnaire responses, such as those that were incomplete.

371 respondents in all made up the online questionnaire's final analysis, which satisfies the sample size S needed for this study. With a proportion of 66%, the age range of the majority of responders was 23 to 27. Ages 18 to 22 accounted for 29% of the total. As seen in Table 1, however, only a very tiny percentage; 3% for those over 33 and 2% for those between the ages of 28 and 32 are in these age groups. Students in their third and final year at universities or colleges where they are permitted to drive on campus comprise the age range of respondents, which spans from 23 to 27 years old. As seen in Figure 1, there were more female responders in the survey (226 students). There are 145 pupils who are male responses.

Table 1: Age of the Respondents

Age Group	Percentage of Participants
18 to 22	29%
23 to 27	66%
28 to 32	3%
Above 33	2

Figure 1: Gender of the Respondents



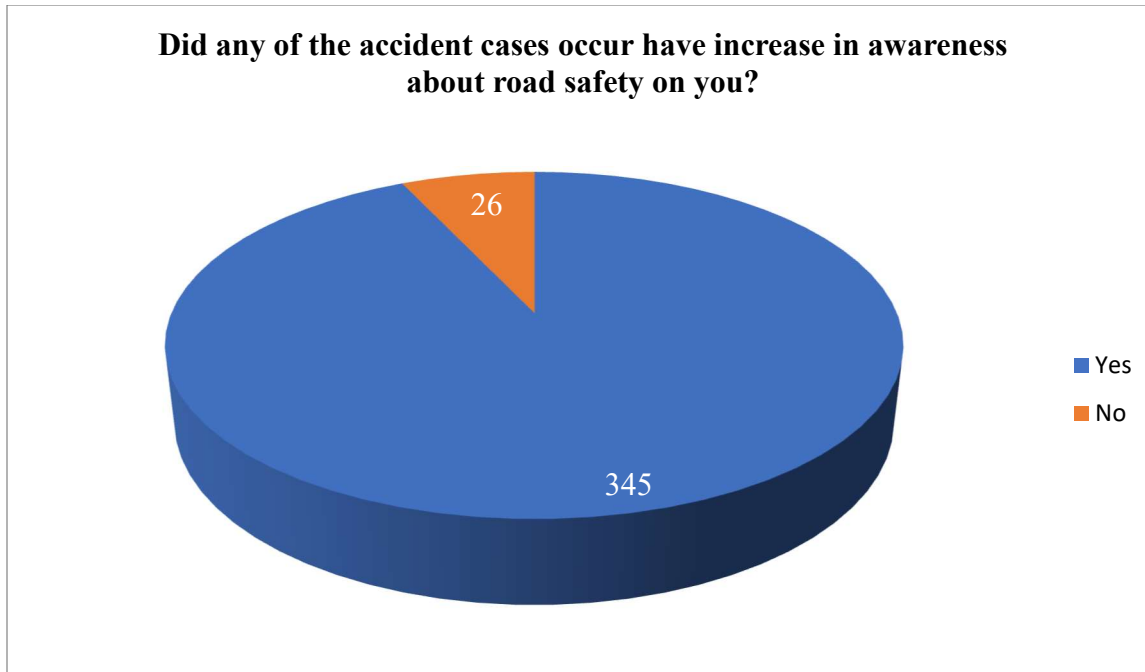
In addition, respondents were questioned about the kind of driver's license they had obtained and if they had ever been in an accident while using a vehicle. Table 2 presents the data graphically.

Table 2: Type of Driving Licence & No. of Accidents

S.No	Type of Driving Licence	No. of Respondents Owning	Respondents Met with Accidents
1	Motor Cycle	31	22
2	Car	169	98
3	Car + Motorcycle	143	99
4	No Licence	28	15

Thirty-one of the 371 respondents held a two-wheeler license, 169 had a vehicle license, 143 had a license for both a car and a motorcycle, and the other twenty-eight had no license at all. The majority of responders have a driver's license, with 38% having both a motorbike and a driver's license. Out of the two sets of responders, 98 individuals with a two-wheeler license have had an accident. However, 99 responders with a complete license had experienced an accident in the past. Just 4% of those who did not have a driver's license, which includes pedestrians and cyclists, had been in an accident prior to this. Figure 2 shows the total percentage of respondents who agreed that having an accident had an impact on their awareness of road safety. The great majority of respondents, who made up of 345 pupils, concurred that having an accident did make them aware of how important it is to practice road safety on a daily basis in order to respect human life.

Figure 2: Responses to Safety Norms



Respondents' understanding of traffic laws and regulations is evaluated; the findings are displayed in Table 3. The majority of respondents were able to accurately answer each question, indicating that they generally have a basic awareness of traffic safety. It is not permitted to turn on a warning light while in hurry or when you need to go faster. 77% of respondents were able to accurately respond to this statement. The car is signalled to stop by the use of warning lights. 88% of respondents are aware that it is forbidden to overtake on a double-lined road. The majority of respondents [86%] know that it is not permitted to stop for a rest at an emergency landing on a roadway. Helmets are crucial for protecting motorcycle riders from the direct effects of collisions. 98% of respondents agreed with this statement. Ninety percent of those surveyed believed that road signs ought to be functional and simple to read.

86% of responders correctly identify the position of the "P" sticker. Just 66% of those surveyed are aware that the back seat is where vehicle restraint seats belong. 91% of those surveyed are aware that a yellow traffic signal indicates that a car is ready to stop. According to the results, a minority of respondents did not fully understand that some of the acts are traffic offenses that could endanger both their lives and the lives of those around them. For example, 2% of respondents disagreed that wearing a helmet is important, whereas 125 respondents overtook in a double lane, 14% rested in an emergency room, and 9% accelerated during a yellow light in order to beat a red light.

Table 3: Knowledge on Road Safety Rules

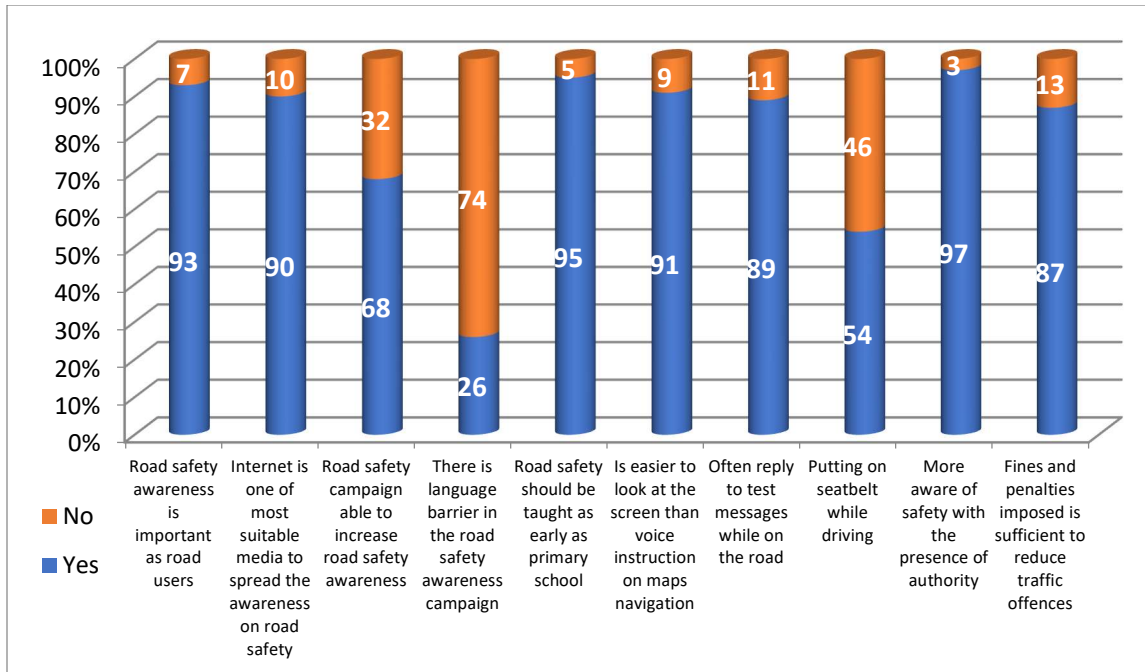
Road Safety Norms	Percentage of the Respondents	
	Correct	Wrong

Driver are allowed put on hazard light if he/she is in a rush and need to speed up	23	77
Driver are allowed to overtake the vehicle in front within a double line road marking	12	88
Driver are allowed to stop their vehicle to sleep/rest at the emergency lane at the highway	14	86
Helmet is very important when riding a motorcycle	98	2
Road signage are easy to understand and functional	90	10
The correct position to put the 'P' sticker is at in front-left and at the back-left	86	14
The suitable position to place child restraint seat in your car is at the front passenger seat	34	66
The yellow light on the traffic light means ready to stop your car unless you have exceeding the stop line	91	9

Figure 3 displays the evaluation of the responses for habits and awareness of road safety. 93% of respondents are aware of the significance of road user awareness of safety. Ninety percent of those surveyed thought that using the internet as a media to raise awareness is appropriate. Nevertheless, 68% of respondents agreed less with the road safety campaign. Merely 26% of participants concurred that language might act as a barrier in the dissemination of campaigns promoting road safety awareness. Furthermore, the results indicate that 95% of participants concurred that road safety instruction need to begin in elementary school. 87% of respondents agreed that the fines and punishments imposed are sufficient to deter them from committing traffic offenses, and 97% of them stated that they are more vigilant when authorities are present.

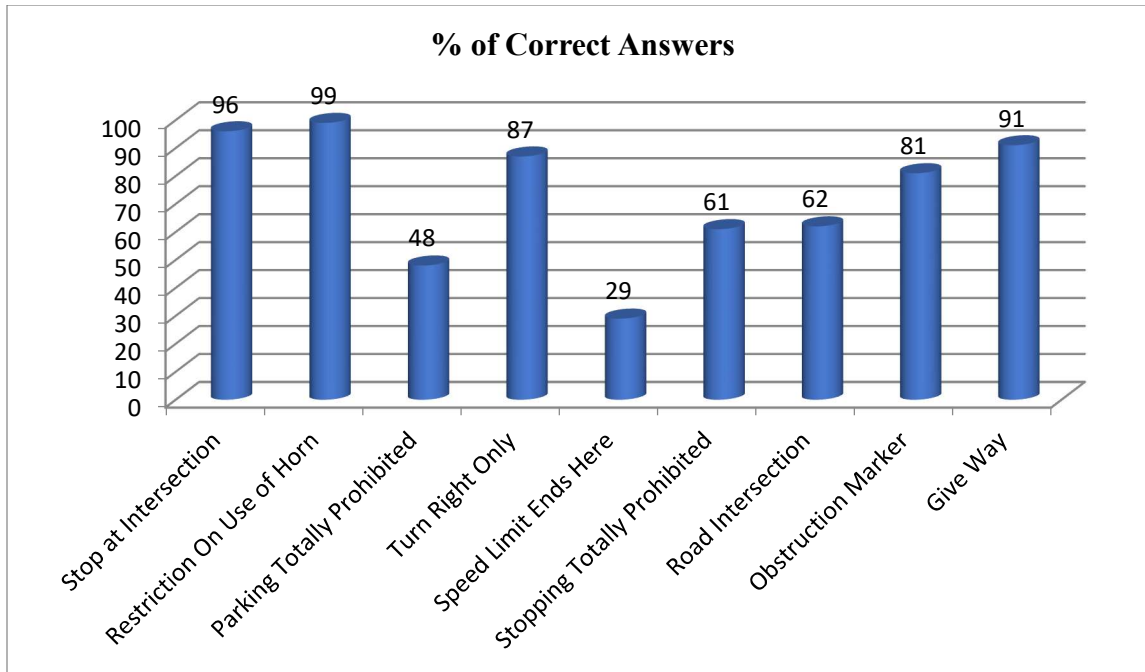
Nonetheless, over 50% of participants acknowledged using a mobile device while operating a vehicle, which obviously goes against endorsing the significance of road safety consciousness. Students are frequently side-tracked by their gadgets when using them for text messaging (89% respondents) and navigation (91% respondents). On the other hand, 54% of respondents said they frequently buckle up when driving.

Figure 3: Road safety awareness and habits



The respondents were requested to answer the questionnaire with respect to road sign towards safety awareness and presented the output in figure 4. Among the road signs, speed limit ends here, and parking totally prohibited are the two road signs that respondents were not able to identify correctly with only 29% and 48% of the respondents know about these signs respectively. Besides these road signs, road intersection and stopping totally prohibited are two road signs with above average score where 62% and 61% of respondents able to correctly identify. Stopping totally prohibited and parking totally prohibited are signs with colour and image that are lacking correlation with meaning or warning the signs are portraying. This is also the case for speed limit end here sign, if without prior education, this could be confusing to determine the meaning. Unlike the high score road signs such as stop at intersection (96%); restriction on use of horn (99%), turn right only (87%), obstruction marker (81%) and give way (91%) where the image and colour truly portray the signs meaning it is to warn which can easily understand and identify.

Figure 4: Road Signs identified by the Respondents



CONCLUSION

The study's respondents are young, inexperienced drivers who are students; over half of them have had accidents in their few years of driving. They exhibit a modest level of awareness of traffic laws, safe driving practices, and road safety. Therefore, it's critical to deepen their comprehension and maybe lower the number of accidents brought on by human behavior. Certain dangerous traffic infractions, such speeding, using a cell phone, and failing to wear a seatbelt or helmet, can cause fatalities in car accidents. The pupils can be exposed to a wider variety of road signs, particularly those that indicate stopping is forbidden and speed limit ends, which might be confusing.

In order to modify their driving attitudes and behavior, educational campaigns should emphasize the value of road safety and the penalties for engaging in unsafe driving activities. Since university students are more focused when using the internet, it can be used to promote road safety. In addition, teaching is a communal process in which educators, traffic cops, and other authorities work together to foster responsible driving in children from a young age through the enforcement of laws and regulations, the creation and implementation of policies, educational initiatives, and other tactics and interventions that advance and enhance road safety.

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