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Research Paper

Risk Perception and Aberrant Driving Behavior Among Autorickshaw in Palakkad

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ABSTRACT

The study examines the relationship between risk perception and aberrant driving behavior among Autorikshaw drivers. The sample consists of 200 Autorikshaw drivers from various locations in the district of Palakkad. The statistics techniques used in this study are Karl Pearson's coefficient of correlation, Arithmetic Mean and Standard Deviation. The results showed that there exists a relationship between variables and hence the hypothesis is accepted. The result indicates that the Autorikshaw drivers who have high risk perception are showing more aberrant driving behavior. The study concluded that some drivers who showed high score on Driver Behavior Questionnaire is found to have low risk perception.

Keywords: *Risk Perception, Aberrant Driving, Autorikshaw drivers*

In Kerala, road transport has to bear solely the major part of and freight movements. For this, it is now the most important mode of transport but ironically deaths from road traffic accidents (RTA) have been now characterized in this state as a hidden epidemic which affects all sectors of society (Ramachandran, 2015). In order to prevent road accidents all over India the government of India took several initiative for the development of roads in India.

Road Development in India

The major initiative undertaken by the government for the development of road sector are:

- The National Highway Development Project (NHDP)
- Pradhan Mantri Bharat Jodo Pariyojana (PMBJP): Linking of major cities to National Highways.
- Pradhan Mantri Gram Sadak Yojana (PMGSY): Construction of rural roads (Arora,2017)

Most of the criminal law is found in the Road Traffic Act, which gives power to the secretary of state for transport to make other regulations regarding various motoring matters. The most important of these regulations are the motor vehicles (construction and use)

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regulations. Much of the civil law which affects motorists is not contained in special rules relating to the roads. It is part of the general law of the land (Miller, Stacey, 1988).

A rickshaw is a simple vehicle that is used in Asia for carrying passengers. Some rickshaws' are pulled by a man who walks or runs in front (Collins, Dictionary). Autorikshaw (in South Asia) is a motorized, three wheeled rickshaw for public hire (Oxford University). It is considered that the factors that contribute to crashes are complex and diverse. The consideration of crashes can be done with the perspectives of crash types, the driving process, driver characteristics, individual differences and impairment. These perspectives account for why crashes occur. It is described that driving safety depends on the social and organizational factors that influence and the infrastructure that supports driving (Lee, 2005). It is said that overcrowding come as a bigger problem and about 132 auto drivers being booked for this offence. Forty-eight drivers were blocked for playing without a driving license. Auto drivers claimed that this is the only mode of transport for many locals. Gramin Seva has been many takers in the city but complaints of blocking main roads and holding up traffic by abruptly stopping in the middle of the road are common (Rao, 2012).

A road accident refers to any accident involving at least one road vehicle, occurring on a road open to public circulation and in which at least one person is injured or killed. Intentional acts (murder, suicide) and natural disaster are excluded (Insee, 2016).

- Approximately 1.35 million people die each year as a result of rod traffic crashes.
- In 2030 Agenda for sustainable development has set an ambitious target of having the global number of deaths and injuries from road traffic crashes by 2020.
- Road traffic crashes cost most countries 3% of their gross domestic product.
- More than half of all road traffics deaths are among vulnerable road user's pedestrian's cyclists and motorcyclists.
- 93% of the world's fatalities on the roads occur in low- and middle-income countries even though these countries have approximately 60% of the world's vehicles.
- Road traffic injuries are the leading cause of death for children and young adults aged 5-29 years.
- Every year the lives of a approximately 1.35 million people are cut short as a result of a road traffic crush. Between 20 and 50 million more people suffer non-fatal injuries, with many incurring a disability as a result of their injury.
- Road traffics injuries cause considerable economic losses to individuals, their families and to nations as a whole. These losses arise from the cost of treatment as well as lost productivity for those who killed or disabled by their injuries, and for family members who need to take time off work or school to care for the injured. Road traffic crushes cost most countries 3% of their gross domestic product.

Socioeconomic status

More than 90% of road traffic deaths occur in low- and middle-income countries. Road traffic injury death rates are highest in the African region. Even within high-income countries, people from lower socioeconomic backgrounds are more likely to be involved in road traffic crashes.

- **Age:** Road traffic injuries are the leading cause of death for children and young adults aged 5-29 years.

- **Sex:** From a young age, males are more likely to be involved in road traffic crashes than females. About three quarters (73%) of all road traffic deaths occur among young males under the age of 25 years who are almost 3 times as likely to be killed in a road traffic crash as young females.

Risk Factors

- The Safe System approach: accommodating human error: The Safe System approach to road safety aims to ensure a safe transport system for all road users. Such an approach takes into account people's vulnerability to serious injuries in road traffic crashes and recognizes that the system should be designed to be forgiving of human error. The cornerstones of this approach are safe roads and roadsides, safe speeds, safe vehicles, and safe road users, all of which must be addressed in order to eliminate fatal crashes and reduce serious injuries.
- Speeding: An increase in average speed is directly related both to the likelihood of a crash occurring and to the severity of the consequences of the crash.
- Nonuse of motorcycle helmets, seat-belts, and child restraints: Correct helmet use can lead to a 42% reduction in the risk of fatal injuries and a 69% reduction in the risk of head injuries. Wearing a seat-belt reduces the risk of death among drivers and front seat occupants by 45 - 50%, and the risk of death and serious injuries among rear seat occupants by 25%.The use of child restraints can lead to a 60% reduction in deaths.
- Distracted driving: There are many types of distractions that can lead to impaired driving. The distraction caused by mobile phones is a growing concern for road safety. Drivers using mobile phones are approximately 4 times more likely to be involved in a crash than drivers not using a mobile phone. Using a phone while driving slows reaction times (notably braking reaction time, but also reaction to traffic signals), and makes it difficult to keep in the correct lane, and to keep the correct following distances.
- Unsafe road infrastructure: The design of roads can have a considerable impact on their safety. Ideally, roads should be designed keeping in mind the safety of all road users. This would mean making sure that there are adequate facilities for pedestrians, cyclists, and motorcyclists. Measures such as footpaths, cycling lanes, safe crossing points, and other traffic calming measures can be critical to reducing the risk of injury among these road users.
- Unsafe vehicles: Safe vehicles play a critical role in averting crashes and reducing the likelihood of serious injury. There are a number of UN regulations on vehicle safety that, if applied to countries' manufacturing and production standards, would potentially save many lives. These include requiring vehicle manufacturers to meet front and side impact regulations, to include electronic stability control (to prevent over-steering) and to ensure airbags and seat-belts are fitted in all vehicles. Without these basic standards the risk of traffic injuries – both to those in the vehicle and those out of it is considerably increased.
- Inadequate post-crash care: Delays in detecting and providing care for those involved in a road traffic crash increase the severity of injuries. Care of injuries after a crash has occurred is extremely time-sensitive: delays of minutes can make the difference between life and death.
- Improving post-crash care: requires ensuring access to timely prehospital care, and improving the quality of both prehospital and hospital care, such as through specialist training programs.

- Inadequate law enforcement of traffic laws: If traffic laws on drink-driving, seat-belt wearing, speed limits, helmets, and child restraints are not enforced, they cannot bring about the expected reduction in road traffic fatalities and injuries related to specific behaviors. Thus, if traffic laws are not enforced or are perceived as not being enforced it is likely they will not be complied with and therefore will have very little chance of influencing behavior (WHO, 2018).

Aberrant Driving

Aberrant driving is an irregular behavior that deviates from what is considered normal. In sociology, the use of the term implies that the behavior in question is performed in secret and mainly for reasons of self-interest, as for example in the case of certain unusual sexual practices (Merton, 1971).

It is showed that aberrant driving is correlated with age and frequency of driving. The drivers who violate traffic rules has bad riding attitudes (Shi, 2016). Attitude reflect the manner in which a person responds to people, things, situations and problems. They are formed from total personal experiences from birth interacting with the emerging personality. Attitude is assumed to influence the behavior of drivers and reckless or unsafe actions are often attributed to negative attitudes. When making a judgment on another person, driver or traffic situation, opinions can rarely be objective. Attitude tends to make drivers see things not as they actually are; but as they imagine them to be (Miller, Stacey, 1988).

The field of applied behavior analysis has developed an impressive technology for reducing the myriad aberrant behaviors engaged by individuals with developmental disabilities. Most interventions apply basic behavioral principles (e g. positive and negative reinforcement, punishment and stimulus control) to discourage aberrant responses and promote adaptive behaviors. In pursuit of an effective technology, the field has focused on the development and refinement of intervention procedure that produce large, durable and general changes in socially meaningful behaviors (Baer, Wolf and Risley, 1968).

The development of favorable attitudes and the changing of negative attitudes is a central purpose for driving instructions, and of vital importance. This may be attempted by education, persuasion and personal example. When faced with influences which affect their attitudes, drivers may characteristically react by being rigid and unresponsive, flexible and objective, or suggestible and over responsive. The design of the road environment permits a certain degree of road user error without incurring accidents. This can negatively reinforce erroneous actions simply because drivers get away with the deficient behavior. This tends to develop a feeling of immunity and influence the individual's attitude as to the degree of risk they think they are taking. Attempts to encourage favorable attitudes may be more successful if directed to emphasize the consequences of unsafe behavior rather than simply aimed towards altruistic ideals. Various teaching methods may be used to develop safe driver attitudes. These should involve a combination of formal lectures, lesson demonstrations and discussion exercises which link the individual's survival to defensive driving behavior. After completing the course new drivers should be able to:

- Recognize the features of road design where accidents are most likely to occur;
- Identify the causes of road accidents and correctly assess their personal risk of becoming involved in one;
- Correctly estimate their own driving capabilities and limitations;

- Apply defensive techniques that minimize the level of potential risk of becoming involved in an accident (Miller, Stacey, 1988).

Risk Perception

Perception is the way in which we select, organize and interpret sensory input to achieve a grasp of our surroundings (Baron, 2002). Risk perception is the subjective judgment that people make about the characteristics and severity of a risk. Several theories have been proposed to explain why different people make different estimates of the dangerousness of risk. Three major families of theory have been developed:

- Psychological approaches (heuristics and cognitive)
- Anthropology/sociology approaches (cultural theory)
- Interdisciplinary approaches (social amplification of risk frame work) (Rani, 2015) The perception of a particular traffic hazard involves the primary information-processing function of the brain. These appear to involve comparisons with existing knowledge and previous experience. Hazard recognition requires an active and rapid assessment of the potential risks involved in a particular situation. The driver must anticipate events before they occur. This relies heavily on stored memories of previous learning or similar experiences. Other relevant factors include the driver's personality and level of arousal, motivation and attitude. Perception is the driver's visual and mental awareness. It provides information on speed, position and timing. Numerous studies show that drivers have limited perceptual capacities but are frequently faced with an overload of information from the vehicle and the road and traffic environment. A decision must be made to attend to some of the available information and reject, ignore or fail to attend to other aspect of it. New drivers should be encouraged to recognize this discrepancy between the task demands and their own personal capabilities. Such an acknowledgement may serve to motivate the application of defensive driving technique as a means to bridge the gap between the task demands and ability (Miller, 1988). Thus risk perception refers to driver's experience of risk in potential traffic hazards. Risk perception is determined by the information of the potential hazards in the traffic environment, and on the ability of driver to perceive the potential hazards resulting into actual accidents (Brown, Groeger; 1988).

Assessing the risks and deciding on an appropriate response to a traffic hazard involves a continuous re-circulating chain of checking, re-checking, assessing and re-assessing a constantly changing environment. It involves

- Assessing the degree of risk involved in the hazard.
- Awarding priorities to the hazard in relation to the whole traffic scene.
- Directing further attention to it.
- Responding by signaling intentions and/or maintaining or changing speed and/or position to create time for the situation to change and/or to obtain additional information about the situation before re-assessing (Miller, Stacey, 1988).

Definition of Key Terms Aberrant Driving

Conceptual definition: Aberrant behavior are defined as a series of errors and violations during driving which may lead to road accidents (Ketabi, Barkhordari and Mehrparvar, 2010).

Operational definition: Irregular behavior that deviates from what is considered normal (Merton, 1971).

Risk Perception

Conceptual definition: Risk perception is the tendency for people to have different dramatically estimates of risk probability and impact given the same information (John Spacey, 2017).

Operational definition: Risk perception is the knowledge and understanding of risk associated with a task and the related consequences in the given environment.

Statement Of the Problem

A study on relationship between risk perception and aberrant driving among Autorikshaw drivers.

Need And Significance

In the present world accidents are increasing day by day. It occurs mainly due to the violation of traffic rules and other aberrant driving behaviors. As Autorikshaw is the vehicle of poor, accidents by this can affect them badly. There are various causes for accidents such as careless driving, violation of traffic rules, over speed and so on. The drivers might feel that they are safe while violating traffic rules. So, it is essential to find out the relationship between aberrant driving behavior and risk perception. Although there were many studies conducted in the world to study about aberrant driving behavior and risk perception among drivers, but there are only few studies conducted in India. And this study might give a contribution about road safety to our country.

LITERATURE REVIEW

A study in 2018 conducted by Edward et al., on Health care for truck drivers: Assessing accessibility and appropriateness of South African Road side wellness centers' aimed to explore truck driver's views regarding access to appropriateness of, selected South African North star Road side wellness centers (RWCs) coupled with understanding their health-seeking behavior. The semi-structured interviews is the method used in this study. Overall users were satisfied with RWC locations, operating hours, infrastructure and healthcare worker attitudes. It is concluded that comprehensive care packages delivered through accessible satellite facilities should form the foundation of service delivery model for truck drivers and other mobile populations.

In 2018, a study on 'Hazard perception test developed for Lithuanian drivers' was conducted by Tuske et al., The aim of the research was to develop the Lithuanian hazard perception test based on static traffic images and test its psychometric properties. The sample consists of 34 experienced drivers and 125 drivers with diverse driving experience. This study was based on static traffic images and test its criteria and construct validity and psychometric properties (internal consistency and test-retest reliability) among Lithuanian drivers. Results demonstrated that the test has satisfactory internal consistency and test-retest reliability.

The study conducted by Ngueutsa and Kouabenan (2017) on 'Accident history, Risk perception and Traffic safe' aimed to clarifies the association between accident history, perception of the riskiness of road travel and traffic safety behaviors by taking into account the number and severity of accident experiences. The study was conducted on a sample of 525 road users. Safe behavior scale was the tool used in this study and the statistical methods used in this study were Cronbach's alpha, Linear-regression and ANOVA. The results showed that participants who reported involvement in more than three accidents or

involvements in a severe accident perceived road travel as less risky and also reported behaving less safely compared with those involved in fewer, or less severe accidents.

Rajesh et al., (2017) conducted a study on modeling safety risk perception due to mobile phone distracting among four-wheeler drivers. The aim of the study is to understand how the vehicles and drivers characteristics influence mobile phone usage while driving and associated risk perception of road safety incidents. This study was conducted in a sample of 110 drivers drawn from one district. Items with cronbach's alpha (< 0.6>) were used to modify the questionnaire and the survey was conducted again. Confirmatory factor analysis is undertaken to test and validate the proposed model. Structural equation model (SEM) is designed to evaluate how well a proposed conceptual model consisting of observed indicators and hypothetical constructs explain or fits the collected data. The result showed that among the three drivers – drive characteristics Human factors influence the distraction perception due to mobile phone the most. It is also observed that the safety risk perception due to mobile phone use while driving is moderate. The research showed that there is a need to emphasize behavior- based controls to reduce mobile phone while driving.

In 2015, a study conducted by Bener, Razzak, Crundall and Allen on 'The relationship between four-wheel drivers and risky driving behaviors' aimed to determine the association between risky driving behaviors and 4WD vehicles and its impact on road traffic accidents in the state of Qatar. The study was conducted on a sample of 1824 drivers in Qatar. The Driver Behavior Questionnaire (DBQ) and Driver Skill Inventory (DSI) were the questionnaires used to collect the data. Multivariate Logistic Regression was the statistical method used to analyze the data. The results showed that drivers of 4WD significantly higher between 30-50 years age and having more driving experience. A significantly higher proportion of 4WD drivers had previous penalties for traffic violation. The research showed that the drivers of 4WD cars are at higher risk of crashes as compared to the drivers of small cars.

Alan and Zhangb (2015) conducted a study on 'Dimensions of driving anger and their relationships with aberrant driving'. The aim of the study was to investigate the relationship between driving anger and aberrant behaviors. The tools used in this study were Driving Anger Scale (DAS) and Driver Behavior Questionnaire (DBQ). The statistical methods used in this study were Confirmatory factor analysis and Exploratory-factor analysis. The results showed that drivers with different patterns of driving anger would show different behavioral tendencies and as a result intervention strategies may be differentially effective for drivers of different profiles.

Cheng, Liu and Tulliani (2015) conducted a study on 'Relationship between Driving violation behaviors and Risk perception in Motor cycle accidents'. The objective of this study was to explore the relationship between driving-violation behaviors and perception of the risk associated with potential accident cause and to assess the contribution of these factors to active

involvement in accidents among Chinese motorcyclist. The sample consists of 621 participants. A specially developed questionnaire to assess their driving-violation behaviors and perception of potential causes of motorcycle accidents. The statistical methods used in this study were bivariate-correlation analysis and logistic regressions. The results showed that a relationship was identified between driving-violation behaviors and risk perception. This study could assist occupational-therapy practitioners involved in driving rehabilitation

and training to identify strategies to deal with driver's violation behavior and risk perception.

In 2015, a study on "Risk perception and Risk-Taking Behavior of construction site Dumper Drivers was conducted by Bohm and Harris. The aim of the study was to explore dumper driver's and subject matter expert's risk perception and its relationship to risk taking behaviors. The researcher used the paired comparison technique in this study. The results suggested that driver risk perception was linked to the "perceived dread" of an accident rather than its likelihood and that risk-taking behavior was often driven by situational factors, such as site safety rules or the behavior of the personnel on the site, together with an over aching culture that prioritizes production over safety. It was found that driver risk perception significantly differed from measures of "objective risk", derived from accident data and also from SME's risk perception. Furthermore, drivers still engaged in undertaking perceived high risk behaviors.

Biasonni, Balzarotti and Cicero(2015), conducted a study on the topic "The contribution of safe driving training in educating drivers to risk perception". The aim of the study is to examine if an increase in self-confidence and perception of ability, resulting from a safe-driving training, is associated to an increase in risk perception and awareness. The study is conducted on a sample of 228 participants. The questionnaire used in this study is Risk Perception in Action Questionnaire (RIPAQ). ANOVA is the statistical tool used in this research. Results showed that, comprehensively, the risky situation depicted in the questionnaire are evaluated as more hazardous after the subjects followed the safe driving training. Nine out of thirteen, indeed, were evaluated significantly more risky after the subjects have followed the training. The results of this study have important implications for the design of safe-driving trainings. It can be assumed that if the practical-experimental activities in the training are integrated with intervals dedicated to careful consideration about the experience, this would result in a more specific and grounded increase in risk perception.
In 2014, a study on 'Empathy, Conformity and Cultural factors related to aberrant driving behavior in a sample of Urban Turkish drivers' was conducted by Nord, Ozlem and Koglub. The aim of the study was to examine the role of empathy and conformity trait as well as cultural individualism or collectivism and uncertainty avoidance for aberrant driving behavior in a sample of Turkish Urban drivers. The sample of this study consists of 179 drivers. Driver Behavior Questionnaire (DBQ) was the tool used in this study. Results showed that the traits and cultural factors were associated with driving violations and errors.
Carter et al., (2014) conducted a study on social norms and risk perception: predictors of distracted driving behavior among novice adolescent drivers. The aim of the study was to examine the influence of risk perception, sensation seeking, as well as descriptive and injunctive social norms on adolescent Distracted Driving Behavior using the theory of normative social behavior. The sample consisted of 403 adolescents of age between 16 to 18 years. Survey instruments measured self-reported socio-demographics, DDB, sensation seeking, risk perception, descriptive norms and injunctive norms. Hierarchical multiple linear regression was used to predict the influence of descriptive and injunctive social norms, risk perception and sensation seeking on adolescent DDB. It is concluded that adolescent risk perception and descriptive norms are important predictors of adolescent distracted driving.

Study on objective evaluation method of taxi driver safety consciousness is a research conducted by Zhae et al., (2014). The objective of this study is to conduct researches on the correlation between driver safety consciousness and several indices, and purpose an

objective evaluation criterion, which can covert immeasurable safety consciousness to measurable safety indices. This study was conducted among participants that consisted of 20 drivers including 7 females. The safety consciousness among taxi drivers was evaluated by using fizzy comprehensive evaluation method and combined with GPS surveillance data, the correlation between driver safety consciousness and the mean speed, speed dispersion and maximum vehicle speed was analyzed. The results showed that driver safety consciousness level is correlated with accident numbers and not correlated with the mean speed, correlated with vehicle speed dispersion and highly correlated with maximum vehicle speed. The level of driver safety consciousness is the guidance of driving safety.

Vanessa et al., (2014) conducted a study on the topic "personality domains and traits that predict self-reported aberrant driving behaviors in a South Asian University sample". The aim of this study was to use a comprehensive measure of personality to investigate which personality traits are most predictive of aberrant driving behaviors (aggressive violations, ordinary violations, errors, lapses). The study was conducted in a sample of 285 young adults (67% females) from a university in the South Eastern US. The questionnaire used in this study are DBQ (Drivers Behavior Questionnaire) and the personality inventory for DSM-5, which indexes 5 broad personality domains (Antagonism, Detachment, Disinhibition, Negative Affectivity, Psychoticism) and 25 specific trait facets. The statistical methods used in this research were confirmatory factor analysis and structural regression analysis. The structural regression analysis revealed that the personality domains of antagonism and negative affectivity best predicted both aggressive violations and ordinary violations, whereas the best predictors of both errors and lapses were negative affectivity, disinhibition and to lesser extend antagonism. The result showed that hostility was the best predictors of aggressive violations; risk taking and hostility of ordinary violations; irresponsibility, separation insecurity and attention seeking of errors; and preservation irresponsibility of lapses.

Machado et al., (2014) conducted a study on the topic "A stated preference experiment for undertaking drivers risk perception". The aim of the study is to investigate the key factors that affect drivers risk perception. The research was conducted in a total sample of 788 interviewees through an online questionnaire. The sample was made up of almost the same number of males as females. The Ranking Order Logit [ROL] model is a tool used in this study. ROLM is used for assessing the relationship between driving behavioral factors and drivers perception of risk, which can be measured as a multiplicative factor in the odds due to change in the more dangerous level of the attribute, considering all equal. The results showed that males in the sample, who generally reported lower percent change in odds than females, might have a higher indicator of perceived safety than females. Traffic accidents were influenced by several different factors that related to the infrastructure of the road, the vehicle, the weather condition and the driver. Driver's behavior plays a key role in the safety of their driving, as the infrastructure of the roads and vehicles has been continuously improved and advanced, reducing their role s significant risk factors.

In 2012, a study conducted by Lotfi on 'Aberrant driving behavior in two Maghreb Countries: Tunisia and Algeria' aimed to investigate the factorial structure of the Driver Behavior Questionnaire (DBQ) in Tunisia and Algeria and to examine the relationship between the factors of the DBQ and accident involvement. This study was conducted on a sample of 1822 Tunisian citizens and 1585 Algerian drivers visiting Tunisia. DBQ is the tool used in this study. The statistical method used in this study are principal component

analysis and Logistic regression analysis. The results showed that Algerian drivers score higher than Tunisian drivers on DBQ items.

The study conducted by Constantinou et al., (2011) on 'Risky and aggressive driving in young adults: personality matters' aimed to identify motivational factors behind risky driving behavior and examines the role of personality, especially sensation seeking, impulsivity and sensitivity to reward or punishment in predicting negative driving outcomes among young drivers. This study was conducted on 352 participants. Exploratory factor analysis was used for validation. The results indicated that direct personality effects on driving outcomes were few, whereas personality had significant correlations with aberrant driving behavior. The research showed that personality is important in understanding aggressive and risky driving by adult and need to be taken into consideration in designing targeted accident prevention policies.

In 2010, a study on 'Aberrant Behaviors and Road accidents among Iranian Truck Drivers' was conducted by Ketabi et al., The study aimed to assess the association between aberrant behaviors of truck drivers and the incidents of road accidents on Yard, a center of Iran. This study was conducted on a sample of 300 truck drivers. Driver Behavior Questionnaire (DBQ) is the tool used in this study. The statistical methods used in this study were Multiple- regressions and Cronbach's alpha. The results showed that more the drivers driving was influenced by emotional and mental states the more deliberate violations and slips. The research showed that among truck drivers, safety has not developed sufficiently, and because of the dangers of road accidents both for the drivers and other people and its economic losses, the importance of the presenting some solutions is completely obvious.

In 2010, a study conducted by Ma, Yan and Huang on 'safety of public transportation occupational drivers: risk perception, attitudes and driving behavior' aimed to identify crash risk factors associated with demographic characteristics, driving-related experiences and aberrant driving behaviors of the drivers of the public transportation vehicles as well as to establish the influence of risk perception, risk-taking attitudes and risky driving behaviors. This study was conducted on a sample of 248 taxi and bus drivers in Wuhan, China. Two risk perception scales were used to collect data from participants. The statistical method used in this study was the structural equation model. The results showed that drivers who both reported more tendencies toward aggressive violations and ordinary violations and had previously been involved in crashes were at high risk of crash involvement.

"Safety of public transportation occupational drivers: Risk perception, attitudes and driving behavior" is a study conducted by Xinping and Huang, (2010). This study aims to identify crash risk factors associated with demographic characteristics, driving-related experiences and aberrant driving behaviors of the driver's public transportation vehicles as well as to establish the influence of risk perception, risk-taking attitudes and risky driving behaviors. This study was conducted on a sample of 248 taxi drivers. The data used for analyses were obtained from a self-reported questionnaire. The statistical method used in this study is structural equation model. The result showed that drivers who both reported more tendencies toward aggressive violations and ordinary violations and had previously been involved in crashes were at high risk of crash involvement.

Gabuade et al., (2010) conducted study on self-regulatory driving behaviors in the elderly; relationship with aberrant driving behaviors and perceived abilities. Aim of the study was to examine in a sample of older drivers (1) the validity of a French version of the Manchester

driving behavior questionnaire and (2) the relative predictive value with respect to self-imposed driving limitation of this French version of the DBQ and of perceived driving abilities. The sample consist of 1500 men and women retirees owning a car and shared out equally between 4 areas with different population densities of the Rhone department (France). The original version of the driving behavior questionnaire was used in the study. The statistical method used by the researcher in the study were principle component analysis and sequential multiple linear regressions. The research showed that about two-thirds of the sample drove 8000 km per year and over, but driving less than 8 km per year was reported more frequently by the older part of the sample than by the younger part. 38.7% of the drivers reported at least one crash within the past 3 years. Analysis about the structure of the current French version of the DBQ revealed 3 factors, which referred to inattention errors, serious errors and violations.

In 2009, a study on 'Novice Drivers Risky Driving Behavior, Risk perception and crash risk: Findings from the drive study' was conducted by Ivers et al., The study aimed to explore the risky driving behaviors and risk perception of a cohort of young Novice drivers and sought to determine their associations with crash risk. The study was conducted on a sample of 20822 drivers. The drive study questionnaire was the tool used in this study. The statistical method used in this study was Poisson Regression Model. The results showed that high scores on questionnaire items for risky driving were associated with a 50% increased crash risk. It is also showed that high scores for perception were also associated with increased crash risk in unvariate and multivariate models; however, significance was not sustained after adjustment for risky driving. The research showed that risky driving behavior is strongly linked to crash risk among young drivers and overrides the importance of risk perception.

Steg and Brussel (2009) conducted a study on 'Accidents, aberrant behaviors and speeding of young moped drivers'. The study aimed to examine why young moped riders are often involved in traffic accidents. This study was conducted on a sample of 146 young moped riders in Netherlands. Moped Rider Behavior Questionnaire (MRQ) is the tool used in this study. The statistical methods used in this study were confirmatory factor analysis and multiple group method. The result showed that speeding violations were the most common aberrant behavior among moped riders. The research showed that attitudes, subjective norms and perceived behavior control predicted a substantial proportion of the variance in speeding, indicating that the theory of planned behavior is successful in predicting speeding.

A study in 2008 by Abdulbari, Ozkanab and Lajunenb on 'The driver behavior questionnaire in Arab Gulf countries: Qatar and United Arab Emirates' aimed to investigate the factor-structure of the DBQ, then to examine the relationship between the factors of DBQ and accident involvement, and finally to compare DBQ scores between the two Gulf countries: Qatar and United Arab Emirates (UAE). The participants in this study consists of 1110 Qatari and 1286 UAE drivers. Driver Behavior Questionnaire (DBQ) was the questionnaire used in this study. Factor analysis and Logistic regression were the statistical methods used in this study. The results showed that UAE drivers scored higher on almost all DBQ item than Qatari Drivers. The research showed that only very small differences between men and women on the DBQ item scores were found in UAE.

A study in 2008 conducted by Panelingunn, Lund and Rundmo on 'cross-cultural comparisons of traffic safety, risk perception, attitudes and behaviors' aimed to examine cultural differences in risk perception and attitudes towards traffic safety and risk taking

behavior in the Norwegian and the Ghanaian public. The study was conducted on a sample consists of 247 Norwegian and 299 Ghanaian respondents. The result showed that there is potential for further improvement of safety attitudes and risk behavior among Ghanaian as well as Norwegians. It is concluded that perceived risk and attitude also significantly predicted risk behavior and accidents or collision.

Fergusson, Campbell and Horwood (2007) conducted a study on 'Risky driving behavior in young people: prevalence, personal characteristics and traffic accidents'. The study aimed to examine the prevalence of risky driving behavior among young people, the characteristics of those who engage in risky driving behavior and the association between risky driving behavior and accident risk. This study was conducted on a sample consists of 907 participants who reported having driven a motor vehicle. Self-reported risky driving behaviors, traffic accidents and a variety of individual characteristics were used to gather data. The result showed that more than 90% of drivers engaged in some forms risky driving behavior. The research showed that risky driving behaviors are common among young people, particularly among young males prone to externalizing behaviors. It is also found that risky driving is strongly linked to traffic accident risk.

In 2005, a study on 'Predicting aberrant driving behavior: The role of executive function' was conducted by Tabibi et al., The aim of the study was to assess the relevance of three components of executive function: working memory, sustained attention and behavioral inhibition for explaining aberrant driving behavior, driving errors, driving violations and crashes. A total of 107 participants with a valid driving license participated in this study. The tools used in this study were continuous performance task and driver behavior questionnaire (DBQ) and Wechsler Digit Span Backward. The statistical methods used in this study were correlation and regression. The results showed that aberrant driving behavior and driving errors were significantly correlated to sustained attention and behavioral inhibition. The research showed that inhibitory control related to different aspects of driving indicating that impulsivity may underlie various aberrant driving behavior and crashes.

In 2005, a study on 'Traffic psychology and Behavior' was conducted by Abdulkari, Ozkanab and Lajunenb. The aim of the study was to develop an instrument for measuring "positive" driver behaviors and to investigate the relationship between these behaviors, DBQ scales, aggression, traffic offences and accidents. The sample of this study consists of 306 Turkish drivers. The scales used in this study were Driver Behavior Questionnaire (DBQ) and Driver Aggression Indicator Scale (DAIS). The statistical method used in this study were Factor analysis, Negative Binomial Regression and Multiple Regression Analysis. The result showed that violations were related to the number of accidents and penalties. The research showed that positive driver behaviors were negatives related to hostile aggression

Paolo (2005) conducted a study on sleep-related car crashes: Risk perception and decision making processes in young drivers. The aim of the present study is to analyze factors affecting worries, coping strategies and decisions of young drivers regarding the risk of sleep- related car crashes. This study also analyses whether framing the same information about sleepiness in two different linguistic forms influences: (1) the evaluation of the level of risk associated to a specific level of drowsiness (Attribute framing problem); (2) the willingness to enact strategies to prevent sleepiness before night-time driving (Goal framing problem); (3) the choice between two different ways, both of equal expected efficacy, of lowering drowsiness (Risky decision making framing problems). The sample consisted of 695 young drivers. The results showed that experiences of sleep attacks and nocturnal

driving frequency in the past six months affect both risk perception and the preventive strategies adopted. Furthermore, the manipulation on two out of the three problems (attitude and risky decision-making frames) significantly affected the respondent's evaluation.

Gabriel et al., (2005) conducted a study on risk perception and impulsivity: Association with risky behaviors and substance abuse disorders. The aim of the study was to investigate the association of risk perception and impulsivity with risky behaviors among adults with unintentional blunt trauma. The sample consisted of 756 patients. Risk perception and impulsivity were measured by a questionnaire. Pearson's chi-square statistic was used to investigate risk perception, impulsivity, substance abuse and possible confounders relative to risky behaviors. The results indicated that low risk perception and high impulsivity were significant risk factors for risky behaviors. After adjustment for confounding factors, low risk perception and high impulsivity remained significantly associated with risky behaviors in the trauma patient population.

Tay and Knowles (2003) conducted a study on 'Driver inattention-Drivers perception of risks and compensating behaviors'. The aim of the study is to explore driver's perception of

the risks associated with inattentive behaviors while driving and their self-reported incidences of behaviors such as eating, drinking, using a mobile phone, handling the stereo system, reading, writing and looking at scenery and attractive pedestrians. This study also attempted to assess if drivers self-regulate such behaviors in response to different road and traffic environment, as predicted by the risk compensation hypothesis. A self-administered questionnaire was designed to gather relevant information from the respondents regarding perception of the risks involved in several activities that would distract from driving tasks and their self-reported inattentive behaviors. This study was conducted in a sample of 140 participants. The results showed that drivers were more likely to participate in inattentive behaviors in a road and traffic environment that they deemed to be safer and less likely to undertake such activities under more adverse conditions.

METHODOLOGY

The following chapter contains the detailed description about the objectives, research designs, methods, procedure and statistical tool used in the study.

Objectives

There exists a relationship between risk perception and aberrant driving behavior among Autorikshaw drivers.

Participants

Sample is a subset of the population. It comprises only some elements of the population. Sampling is a process of selecting an adequate number of elements from the population so that the study of the sample will not only help in understanding the characteristics of the population but will also enable us to generalize the result. In the present study, the sample consists of 200 Autorikshaw drivers from various locations in the district of Palakkad.

Inclusion Criteria

1. Autorikshaw drivers from various locations in Palakkad.
2. Males
3. Between age limit 25-65

Exclusion Criteria

1. Autorikshaw drivers below age 25 and above 65.
2. Autorikshaw drivers from other districts.
3. Female Autorikshaw drivers.

Procedure

After establishing the rapport and obtaining consent for the study, the tools for aberrant driving and risk perception were administered to the sample by reading out all the questions and translate it to them. Then the data was taken for analysis.

Variables

A concept which can take on different quantitative values is called a variable. In this study the dependent variable is aberrant driving and the independent variable is risk perception.

Aberrant Driving

Aberrant driving is an adequate behavior that deviates from what is considered normal. In sociology, the use of the term implies that the behavior in question is performed in secret and mainly for reasons of self-interest, as for example in the case of certain unusual sexual practices (Merton, 1971).

Risk Perception

Risk perception is the subjective judgment that people make about the characteristics and severity of a risk (Rani, 2015).

Instruments

The various method of data gathering involved the use of appropriate recording forms. These are called tools or instruments of data collection. For the current study the following instruments are used.

1. **Socio-demographic sheet:** Socio-demographic sheet is a semi- structured interview schedule. In this study socio- demographic sheet used to collect information regarding relevant variables such as name, sex, education, marital status and other details about the Autorikshaw drivers.
2. **Driver Behavior Questionnaire:** The Driver Behavior Questionnaire (DBQ) consists of 27-items. This too was originally developed in Britain. It was developed by Reason et.al (1990). The 27- items were measured on a six-point Likert with zero describing "Never" and five describing "Nearly all the time". The DBQ has very high level of internal consistency and reliability i.e.; the Cronbach's alpha of 0.91 and 0.89. For the content validity, the DBQ were seriously review as in terms of relevance, clarity, simplicity and ambiguity.
3. **Risk perception scale** consists of 10-items. The 10-items were measured on a 5-point Likert scale, with three describing "always safe" and zero describing "rarely safe". The overall score or total score range was 0 to 30. High scores in this scale represent more risk driving behavior as well as more risk perception.

Statistical Techniques Used for The Study

Statistics are numerical statements of facts in any department of enquiry placed in relation to each other. The techniques used in this study are Karl Pearson's coefficient of correlation, Arithmetic Mean and Standard Deviation.

1. **Arithmetic Mean:** Arithmetic mean of a given set of observations is their sum divided by the number of observations.

2. **Standard Deviation:** Standard Deviation is defined as the positive square root of the arithmetic mean of the squares of the deviations of the given observations from their arithmetic mean.
3. **Karl Pearson's coefficient of correlation:** Karl Pearson's coefficient of correlation is widely used mathematical method where in the numerical expression is used to calculate the degree and direction of the relationship between linear related variables. The coefficient of correlation is denoted by 'r'. The value of the coefficient of correlation (r) always lies between +1, such as r=+1, perfect positive correlation, r=-1, perfect negative correlation, r=0, no correlation. In the current study correlation is used to find out the relationship between risk perception and aberrant driving behavior among autorikshaw drivers.

RESULTS AND DISCUSSION

Table 4.1: Distribution of sample by their characteristics

VARIABLES WITH CHARCTERISTICS	N	AUTORIKSHAW DRIVERS (N=200)
AGE		
25-35	55	27.50%
35-45	85	42.50%
45-55	45	22.50%
55-65	15	7.50%
EDUCATION		
BELOW SSLC	50	25%
SSLC	96	48%
HIGHER SECONDARY	35	17.50%
U.G	14	7%
P.G	5	2.50%
MARITAL STATUS		
SINGLE	29	14.50%
MARRIED	171	85.50%
NO. OF ACCIDENTS COMMITTED		
0	97	48.50%
1	72	36%
2	24	12%
3	2	1%
MORE THAN 3	5	2.50%
MAXIMUM SPEED OF DRIVING		
BELOW 30	1	0.50%
30-40	21	10.50%
40-50	110	55%
50-60	68	34%

Table 4.1 shows the distribution of the samples by their characteristics such as age, education, marital status, No. of accidents committed, Maximum speed of driving, Average km in a day and income per day. From this table, it is clear that 27.5% of the participants are in the age group of 25-35, 42.5% are in the age group of 35-45, 22.5% are in the age group of 45-55 and 7.5% are in the age group of 55-65. In the case of education, 25% of the participants belongs to the category of below SSLC, 48% of participants completed SSLC,

17.5% completed higher secondary, 75% completed U.G and only 2.5% completed P.G. In marital status 14.5% are single and 85.5% are married. In the case number of accidents committed 48.5% of participants didn't commit any accident, 36% of participants committed accident only once, 12% committed twice, 1% committed 3 times and 2.5% committed accidents more than 3 times. In the case of maximum speed of driving 0.55 of participants belong to the category of below 30km/hr., 10.5% belongs to 30-40km/hr. 55% belongs to 40-50km/hr. and 34% belongs to 50- 60km/hr. 42.5% of participants cover an average km of below 100 in a day, 54.5% cover an average km of 100-200 in a day and only 3% of participants cover 200-300 km in a day. Finally, 32.5% of participants has an average income of below Rs.500 in a day, 59.5% has an income of Rs.500-Rs.1000 and only 8% of participants has an income of Rs.1000-Rs.1500.

Table 4.2: Correlation Analysis: Relationship between Risk Perception and Aberrant driving among Autorikshaw drivers.

VARIABLES	N	MEAN	STANDARD DEVIATION	r VALUE
ABERRANT DRIVING	200	17.88	284.62	
RISK PERCEPTION	200	3.265	64.02	0.7775

Level of significance = 5%

Results indicate that Risk perception has a strong positive correlation (r=0.7775) with Aberrant driving. Thus, the hypothesis "There exist a relationship between risk perception and aberrant driving" is accepted.

In the table 4.2, N represent the number of samples in which the data were collected, indicating the number of 200 Autorikshaw drivers. From the table, it is clear that the mean value obtained for aberrant driving behavior is 17.88 and the standard deviation is 284.62. For risk perception, the mean value obtained is 3.265 and the standard deviation is 64.02. When the values of risk perception and aberrant driving is combined, we get a standard deviation of 14168. The r value obtained for both the variable is 0.7775, which indicate strong positive correlation between the two variables.

From the result it is clear that there exists a relationship between variables and hence the hypothesis is accepted. The result indicates that the Autorikshaw drivers who have high risk perception are showing more aberrant driving behavior. Thus, they are more prone to commit accidents. From this result it is clear that people with high-risk perception tend to show aberrant driving behavior, so the Autorikshaw drivers who have less risk perception are less in crash risk.

Based on the obtained result it is clear that when risk perception increases the chances of drivers to violate traffic rules are more. Thus, drivers with high risk perception are more prone to accidents. Drivers show aberrant driving behavior by failing to notice that pedestrians are crossing when turning into a side street from a main road, they disregard the speed limit on residential road, freeway or rural way and also overtake a slow driver on the inside. Drivers who have high risk perception feels that they are always safe while driving between midnight and 6 am, driving while talking on a mobile phone and also driving with a blood alcohol level just over the legal limit. The result of this study is similar to the result of the study 'Novice drivers risky driving behavior, risk perception and crash risk: findings from the drive study' conducted by Ivers et.al which showed that high scores on questionnaire for perception were associated with the increase of crash risk in unvariate and

multivariate models. The result of the current study is also similar to the result of the study conducted by Cheng, Liu and Tulliani, (2015) on 'Relationship between driving violation behavior and risk perception in motor cycle accident' which showed that a relationship was identified between driving violation behaviors and risk perception. This study could assist occupational therapy practitioners' involved in driving rehabilitation and training to identify strategies to deal with driver's violation behavior and risk perception. From this we can say that people with high risk perception tend to show aberrant driving behavior which leads to traffic rule violations, so the Autorikshaw drivers who have less risk perception are less in crash risk. High scores on risk perception indicate that drivers are feeling safe while violating traffic rules. Thus they are less aware about the road safety. So the aberrant driving behavior go high with risk perception.

SUMMARY AND CONCLUSION

Aberrant driving is a common factor that leads to accidents and kill many people in the world today. High Risk perception lead an individual to violate traffic rules which lead to accidents. The aim of the current study is to find out the relationship between Risk perception and Aberrant driving behavior among Autorikshaw drivers in Palakkad. The current attempt is to find out whether Risk perception has relationship with Aberrant driving behavior among Autorikshaw drivers. The sample of 200 Autorikshaw drivers from various locations of Palakkad district were selected. The Driver Behavior Questionnaire (DBQ) developed by Reason et.al was used to measure the Aberrant driving behavior and Risk perception scale was used to measure risk perception among autotikshaw drivers. Results indicate that risk perception has a strong positive correlation (0.7775) with aberrant driving behavior. Thus the hypothesis "There exist a relationship between risk perception and aberrant driving behavior among autorikshaw drivers" is accepted. On the basis of this study some drivers who showed high score in Driver Behavior Questionnaire is found to have low risk perception. This may be due to the necessity of money to meet the everyday life. In conclusion, the current finding shows that there exist a relationship between risk perception and aberrant driving behavior.

Implications

The result of the present study has a number of implications. Whenever the road accidents or violation of traffic rules are increasing an area, preventive strategies can be implemented to reduce risk perception. So that a healthy road environment can be designed by applying such interventions. Implications for reducing risk perception and aberrant driving behavior can be done by giving awareness programs and group counseling to autorikshaw drivers. Interventions on increasing road safety can be applied or implemented at many other larger areas.

Limitations

1. The sample size considered for the study would be the main limitation.
2. The participants selected were only from various locations of Palakkad district at Kerala.
3. Female autorikshaw drivers and other taxi drivers were not considered in the study.
4. The autorikshaw drivers below the age of 25 and above the age of 65 were also not considered in the study.
5. Economic status and educational status was also excluded.

Suggestions For Future Research

1. Large number of samples with wider locations can be studied.
2. Risk perception and aberrant driving behavior among autorikshaw drivers in urban and rural areas could be analyzed.
3. More variables can be included other than risk perception and aberrant driving.

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Conflict of Interest

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