Analysis of Illegal Road Crossing Behavior of University Students of Bangladesh

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Declaration of Candidate

It is hereby declared that this thesis/project report or any part of it has not been submitted elsewhere for the award of any Degree or Diploma (except for publication).

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Dedication

We would like to dedicate this thesis to our beloved parents.

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"In the name of Allah, Most Gracious, Most Merciful"

All praises to Almighty Allah for giving us opportunity to conduct this thesis work and helping us in solving difficulties during our project work.

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Abstract

Road crossing behavior of university students is a matter of concern for Bangladesh as most pedestrian road-crossing fatalities occur among young university students. Students most often cross the road illegally and risky behavior is observed among this young age group. Most of the university students prefer to commute on foot which makes them particularly vulnerable to road-related hazards. During road crossing use of smartphones, lack of attention and risky behavior can be observed among them. This study aims to identify the factors that influence jaywalking among university students of Bangladesh. A questionnaire survey was used for data collection purposes and 430 students from 50 universities participated in the survey. During the process, data on sociodemographic, environmental, situational, weather variation, road crossing behavior were taken into consideration. A logistic regression model was used to find out the factors which influence the road crossing behavior of the university students. The findings suggest that the most influential factors concerning illegal road crossing behavior are gender, study year, current living area, proximity to university, eye problem, mode of transportation, time of arrival to university, mental trauma, use of smartphone, attention to traffic signs, level of safety knowledge, use of pedestrian facilities, seasonal variation, waiting time, location of crossing, presence of friends. Findings will help policymakers to understand students' jaywalking characteristics and take necessary steps to improve their safety on roads.

Keywords: Jaywalking Behavior, University Students, Pedestrian Safety, Illegal Road Crossing, Safety Perception, Logistic Regression

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Chapter - 01: Introduction

1.1 Background

Due to the rising number of traffic accidents, pedestrian road safety is a serious problem in most of the world's nations. Pedestrians are involved in most traffic-related fatalities. The number of pedestrians is rising quickly along with the population. Recently, the number of pedestrian fatalities has increased to frightening levels. Lack of suitable infrastructure, bad traffic management, and insufficient enforcement of traffic laws have all contributed to the problem's growing severity. As a result, pedestrians frequently crossroads illegally, which is against the law and endangers their safety.

A significant problem regarding pedestrian safety is illegal road crossing, which is now an international issue. It is also seen as a significant public health issue. On an annual basis, 1.35 million people lose their lives in crash-related incidents, and 20 to 50 million people sustain injuries because of road accidents (Mahmud et al., 2021). Vulnerable road users, including walkers, cyclists, as well as motorcyclists, make up about fifty percent of all fatalities worldwide (WHO, 2009). According to the Traffic Management Centre, and Traffic Safety Unit of Canada (2010), Toronto recorded the most pedestrian incident across all cities of Canada in 2009, reaching a pedestrian fatality statistic of 78 per 100,000 individuals. Pedestrians are particularly exposed to pedestrian fatalities. Every year, around 400,000 pedestrians are killed in pedestrian-vehicle collisions globally (Naci et al., 2009). 24% of all traffic fatalities in Great Britain in 2015 were pedestrians, as reported by the UK Department for Transport (Department for Transport, 2018). Additionally, it has been noted that 59% of crashes involve pedestrians, 32% involve drivers, and 9% involve both. (Hoque, 2004). Due to a lack of adequate infrastructure, such as pedestrian overpasses and crosswalks, the situation has become out of control in many developing and impoverished countries. In developing nations, unauthorized pedestrian crossings are particularly risky due to poor infrastructure and irresponsible driving (Kadali & Vedagiri, 2016). In accordance with an investigation from Bogota, Columbia, one-quarter of pedestrians surveyed indicated they were likely to cross the sidewalk under a pedestrian bridge. (Cantillo et al., 2015).

Bangladesh, a country with a high prevalence of traffic fatalities and accidents, places a high priority on road safety. Due to the high walking distances in Bangladesh, most people choose walking over other forms of transportation, which increases their risk of jaywalking (Rifaat et al., 2017). Pedestrians account for approximately 32% of traffic accident victims in Bangladesh, which is approximately 10% higher than the global average (WHO, 2015). Pedestrians have a lack of safety understanding, which causes them to disregard traffic laws. The facilities provided for pedestrians to cross the road, such as overpasses and underpasses, are frequently ignored because they are unaware of traffic laws and regulations. (Pasha et al., 2015). As a result, several pedestrian accidents occur in Bangladesh each year. In Dhaka, 281 pedestrians died from injuries incurred in car crashes in 2008, accounting for 72% of all road users killed that year (Bangladesh Road Transport Authority. 2008). University students, like other vulnerable road users, confront substantial hurdles and (Pasha et al., 2015)risks when crossing roadways. Heavy traffic congestion, inadequate pedestrian infrastructure, and a failure to follow road safety laws all contribute to a dangerous environment for young students.

Figure 1: Students of BRAC university using zebra crossing.

Illegal road activities are common among the younger generation all around the world. Based on National Center for Statistics and Analysis, in 2016 accident rates were most severe among the people of United States between 15 and 19 years and 20 to 24 years. (37 and 31 per 100,000 population, respectively). Distraction during traffic crossings is a major source of worry among young people. Mobile phone use is a widespread kind of distraction among them, making them exposed to illegal traffic actions such as jaywalking. Pedestrians who used their phones while crossing were less safe than those who did not use their phones while crossing at unsignalized junctions. (Pešić et al., 2016). It was discovered that regular cell phone use can lead to unsafe crossing habits (Lennon et al., 2017). Pedestrians' use of mobile causes and music players causes distraction and indirectly increases pedestrian risk (Hatfield, J., & Murphy, S., 2007). According to a poll of 4196 pedestrians crossing the street in China, 328 (or 7.82%) were using their phones, with 162 men and 166 women among them. Distractions such as group crossing, and conversation have been linked to risky pedestrian crossing behavior. (Thompson et al., 2013).
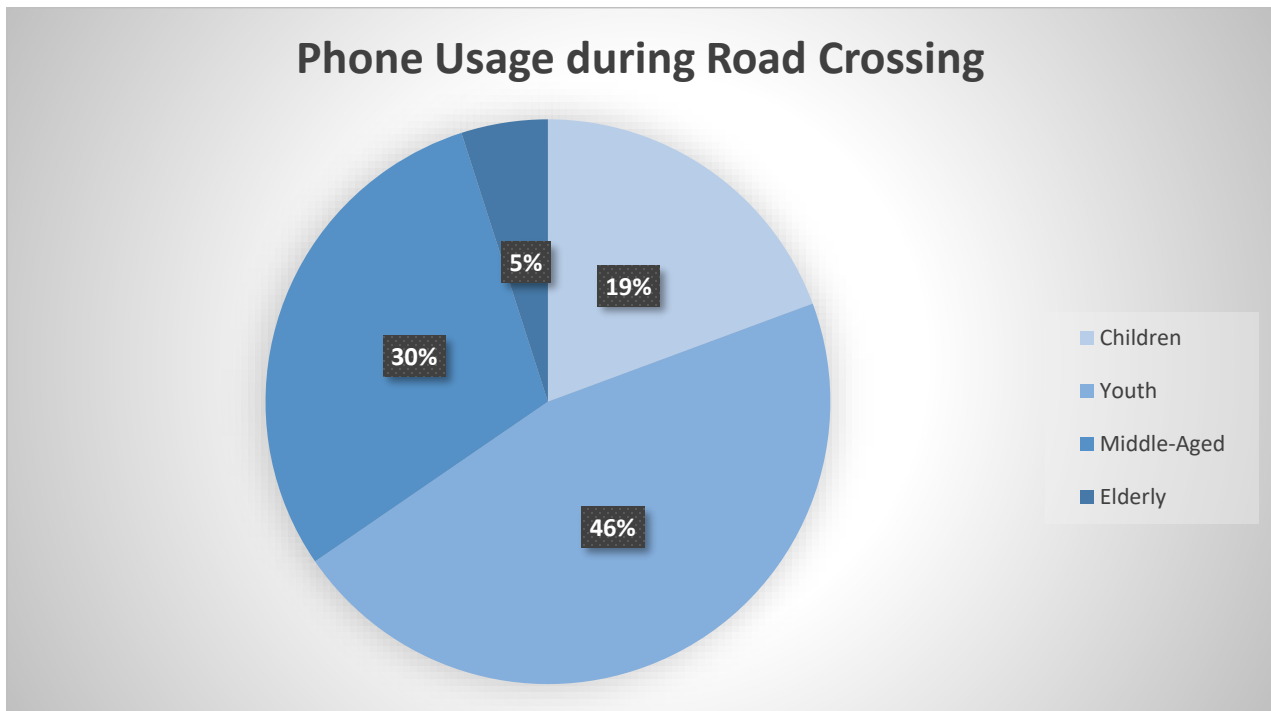
Figure 2: Phone Usage during road crossing (Zhou et al., 2019)

The situation is much more serious in Bangladesh. In 2008, Dhaka accounted for 72% of all national pedestrian casualties, with 281 pedestrians killed in collisions with moving automobiles while jaywalking (Rifaat et al., 2008). In 2019, about 5000 people were killed and 6500 were injured in road accidents in Bangladesh, with many of them being university students who were jaywalking (Hussain, 2020). According to Chittagong City, 41% and 40.75% of pedestrians disobey the rules, respectively, and just 29.09% are between the ages of 18 and 24 who obey the restrictions (Islam et al. 2020). In Chittagong, only 29.09% of young individuals between the ages of 18 and 24 obey the traffic restrictions (Islam, Amit & Rahman, 2020). University students present a significant risk to road safety since they frequently use smartphones when crossing the street. In addition, the presence of friends alters their decision-making process when crossing the street. Most university students engage in unsafe behavior when it comes to road safety.

Figure 3: University students jaywalking.

Figure 4: Protest for ensuring safety of university students.

1.2   Problem Statement

Given the significant research on the pedestrian road crossing behavior and pedestrian safety, just a handful of these studies have investigated the critical pedestrian safety elements linked with illegal road crossing conduct among Bangladeshi university students. Most prior research has focused on traffic law infractions and other safety issues associated with unauthorized road crossings. Throughout Bangladesh, pedestrian facilities such as underpasses, overpasses, and sidewalks are frequently found to be poor, unsanitary, and unsafe.

Consequently, pedestrians, notably the highly educated portion (university students), participate in jaywalking. University students in several developed nations are particularly concerned about the potential dangers of jaywalking and its repercussions, however, students in developing countries including Bangladesh tend to be ignorant of traffic guidelines and restrictions, making them the highest-risk demographic for jaywalking. This study seeks to discover the safety aspects that impact university students' decision-making while crossing a road.

1.3   Objectives of the Study

The key purpose of the study is to identify the safety factors that affect university students' decisions regarding road crossings. Following are the study's objectives:

1. To examine the sociological, demographic, situational factors, weather variance, safety perception, and other factors influencing the level of jaywalking among Bangladeshi university students.

2. To comprehend university students' level of awareness and approach toward illegal road crossing.

3. To gain a better knowledge of the university student's present overall condition regarding jaywalking.

1.4 Scope of Study

To acquire a better picture of the students' conduct, the total number of students surveyed during the survey should be increased. Furthermore, the proportion of female respondents must be the same as the proportion of male respondents. To better understand the students' current situation, additional questions should be included in the survey.

1.5 Study Outline

Chapter 1: Introduction

This Chapter provides the thesis's core idea. It is split into five subsections:

1.1 Background

1.2 Problem Statement

1.3 Objectives of the Study

1.4 Scope of Study

1.5 Study outline

Chapter 2: Literature Review

This chapter provides a written summary of key texts and other materials on the chosen topic. The sub-chapters are:

2.1 Introduction

2.2 Factors of Road Crossing Behavior

2.3 Factors Affecting Road Crossing Behavior among University Students

2.4 Summary

Chapter 3: Methodology

Methodology is an important aspect of this dissertation. It explains the broad philosophical foundations of the chosen research method. It is divided into the following sub-chapters:

3.1 Introduction

3.2 Area of Study

3.3 Data Collection

3.4 Logistic Regression

3.5 Descriptive Statistics

Chapter 4: Analysis and Results

This chapter discusses the statistical approaches used to evaluate the comfort model and validate the created model. The sub-chapters are as follows:

4.1 Introduction

4.2 Model Development

4.3 Analysis and Result

Chapter 5: Conclusion

This is the final chapter that contains the findings and future scope of the research. It's divided into four sub-chapters-

5.1 Introductions

5.2 Policy Implementation

5.3 Limitations and Future Scope

2 Chapter – 02: Literature Review

2.1 Introduction

The conduct of individuals traversing roadways on foot constitutes a critical aspect of urban transportation safety, particularly in heavily populated vicinities such as university premises. It is imperative to evaluate and comprehend the road-crossing behavior of university students in Bangladesh, particularly given the pressing issue of traffic congestion. This review of the literature aims to provide a comprehensive examination of previously conducted research pertaining to the subject matter at hand. It seeks to emphasize noteworthy outcomes and discern inadequacies in the existing pool of knowledge. This review aims to make a scholarly contribution to the enhancement of pedestrian safety in university settings by analyzing the variables that influence road-crossing behavior and the associated risks. The ultimate objective is to develop effective strategies and interventions for ameliorating this issue.

Due to the escalating frequency of accidents and fatalities stemming from road crossing behaviors, pedestrian safety has become a significant area of investigation within the realm of transportation research. Prior research has examined the various elements that exert an influence on the decision-making processes of pedestrians, the ways in which the design of infrastructure affects patterns of road crossing, and the effectiveness of programs oriented towards instruction and enforcement. Through the amalgamation of pertinent evidence, the objective of this review is to propose a conceptual framework for comprehending the road-crossing conduct of tertiary-level students in Bangladesh.

Several factors, such as the absence of pedestrian-friendly infrastructure, traffic congestion, and inadequate traffic enforcement, have been identified as contributing to the prevalence of hazardous road crossing behaviors among pedestrians, particularly among university students as highlighted by Ahmed et al. (2019) This observation emphasizes the potential significance of conducting further research on the specific road-crossing practices of university students in Bangladesh.

Numerous demographic factors, including age, gender, and educational attainment, exert a significant influence on pedestrian conduct. According to Rahman et al. (2018), university students demonstrate a distinctive behavior pattern while traversing streets, in contrast to other demographics. This finding highlights the imperative of crafting interventions that are tailored to this particular population. These findings underscore the importance of understanding the distinct traits and mindsets of university students in order to assess their road-crossing conduct.

Despite the valuable insights furnished by extant scholarship, it is noteworthy that a paucity of research exists on the road-crossing conduct of Bangladesh's university student demographic. The extant body of literature predominantly focuses on elderly age cohorts while tending to neglect the idiosyncrasies of this population subset. The objective of this literature review is to bridge the existing gap by comprehensively gathering and assessing previous studies, thereby providing relevant insights for future interventions and legislative measures aimed at enhancing road-crossing behavior.

The primary goal of this investigation is to make a meaningful contribution to extant initiatives aimed at enhancing pedestrian safety in Bangladesh. Specifically, the study aims to analyze the road-crossing conduct of university students. The present study's outcomes will provide a conceptual basis for subsequent investigation, guiding empirically supported measures aimed at mitigating pedestrian accidents and bolstering overall traffic safety in university settings. The synthesis of prior research and identification of extant gaps in the literature will inform these evidence-based solutions.

2.2 Factors of Road Crossing Behavior

Investigating the behavior patterns of pedestrians during street crossings is a crucial undertaking in ensuring their safety and mitigating the risk of fatality. Numerous research endeavors have been conducted to examine the determinants that impact conduct, especially among college students, who constitute a substantial proportion of metropolitan pedestrians. This section delves into prior studies focused on examining road-crossing behavior across diverse settings, thereby shedding light on the determinants that exert an impact on pedestrian decision-making.

1. Traffic Characteristics:

The features of vehicular movement exert a substantial influence on pedestrian crossing conduct. According to Smith and Johnson (2017), an elevated velocity of a vehicle has a direct correlation with a pedestrian's inclination to delay crossing the roadway. Other studies have produced commensurate results. According to Brown et al. (2019), pedestrians experienced a delay in commencing a road crossing as the intensity of vehicular traffic grew.

2. Individual Pedestrian Characteristics:

The road-crossing behavior of pedestrians is influenced by their discernable traits and characteristics. There existed a significant correlation between the age of pedestrians and their behavior when crossing roads. Anderson et al. (2018) documented that younger pedestrians exhibit a greater propensity towards unsafe crossing behaviors in comparison to their elder counterparts. According to Gonzalez and Lee's (2020) research, male pedestrians exhibited a greater propensity for engaging in risky behavior when crossing at intersections equipped with traffic signals.

3. External Environmental Factors:

The presence of extraneous factors, such as road width and pedestrian amenities, may exert a considerable impact on the manner in which individuals traverse a thoroughfare. Chen et al. (2016) reported that broader thoroughfares were found to have a correlation with lengthier periods of

waiting, as well as heightened propensities for pedestrians to engage in risky behaviors. Additionally, the implementation of pedestrian infrastructure, including crosswalks and pedestrian signals, has been found to yield significant results in promoting safer road crossing behavior (Li et al., 2018)

4. Crosswalks and Pedestrian Signals:

Crosswalks and pedestrian signals are imperative elements in ensuring secure pedestrian movements across roads. A considerable amount of research has been conducted to ascertain the degree of compliance of university students with traffic regulations. An example of citing a reference in an academic manner would be to state: Ahmed et al. reports According to the findings of a study conducted in 2018, a mere 40% of college students adhered to traffic regulations while crossing roads. This postulation posits that a deeper exploration of the underlying reasons for non-compliance is warranted.

5. Uncontrolled junctions:

Uncontrolled junctions pose a plethora of challenges for pedestrians in the absence of traffic lights or delineated crosswalks. According to the research by Rahman et al., university students commonly demonstrate hazardous behavior by crossing streets hastily without heeding a safe break in traffic. The year of publication in academic writing is typically formatted as follows: (2019). In order to initiate specific interventions, it is imperative to gain a comprehensive understanding of the underlying factors contributing to said behavior.

6. Road Crossing During Peak Hours:

When comparing road-crossing behavior during peak and off-peak hours, significant variations in such behavior may be observed. Based on the findings of Khan et al. 's investigative study, research delineates that. In the year 2021, it was observed that university students tended to engage in more hazardous actions in circumstances characterized by considerable traffic congestion, such as traversing roads midway and engaging in jaywalking. This investigation underscores the significance of performing a comprehensive analysis of the factors that impact behaviors exhibited during periods of high traffic volume.

7. Urban Road-Crossing Practices:

In the urban regions of Bangladesh, a dearth of provisions for pedestrian infrastructure, coupled with notable traffic congestion, is a recurrent issue. "Numerous studies have been conducted on the conduct of college students when crossing thoroughfares in urban areas. " An example of scholarly writing can be observed in Rahman et al. 's work In 2018, a field study was conducted in Dhaka wherein it was observed that students exhibited hazardous conduct by disregarding traffic signals and traversing roads at non-designated areas. Hasan and Kabir (2019) underscored the frequency with which college students engage in jaywalking at congested intersections.

8. Rural Areas' Road-Crossing Practices:

While the majority of research has focused on urban settings, it is crucial to consider the behavior of road-crossing in rural areas. The rural roadways of Bangladesh pose specific challenges, including suboptimal visibility and antiquated infrastructure. Rahman and Islam (2020) underscored the significance of social norms and insufficient pedestrian infrastructure in their examination of the road-crossing behavior of university students in rural areas.

9. Pedestrian conduct at crossings with signals:

At signalized crossings, pedestrians frequently encounter traffic control mechanisms such as traffic lights and pedestrian signals. Numerous scholarly investigations have investigated the pedestrian crossing behavior of college students in such scenarios. One example is the study conducted by Ahmed et al. In their study conducted in 2017, the observation was made on the extent to which pedestrians in Dhaka, Bangladesh, adhered to traffic signals. The results of the study indicated that the observance of traffic regulations by university students was lacking, thereby underscoring the necessity of implementing further initiatives focused on education and awareness in this regard.

10. When people cross the street at unsignalized crossings:

At unsignalized crossroads, pedestrians encounter unique challenges as they rely on their discretion to navigate vehicular traffic. In view of such circumstances, research endeavors have undertaken an examination of the manner by which college students engage in the act of crossing thoroughfares. Rahman et al. conducted a study in Chittagong, Bangladesh. In 2019, an observational study was conducted wherein unsafe behaviors, such as jaywalking and crossing in front of oncoming vehicles, were observed and recorded. The aforementioned findings underscore the significance of identifying the factors that exert an impact on the aforementioned behaviors.

11. Road-crossing habits at night:

The perilous nature of traversing roads during nocturnal hours is heightened by the reduction in perceptibility. The study conducted by Rahman and Akhter (2020) investigated the nocturnal road-crossing behavior of university students in urban areas of Bangladesh. A noteworthy observation that emerged from their investigation was the preponderance of precarious pursuits during the aforementioned timeframe, thereby underscoring the imperativeness of enhancing street illumination and safety measures.

2.3 Factors Affecting Road Crossing Behavior among University Students

The conduct of road crossings is a crucial aspect of pedestrian safety, particularly for university students who commonly traverse bustling thoroughfares. Comprehending the factors that impact pedestrian conduct on the thoroughfare is of utmost importance in the development of effective interventions and the improvement of pedestrian security. This section will undertake a comprehensive review of literature pertaining to the diverse determinants that shape the road-crossing conduct of university students in the country Bangladesh.

1. Risk Perception:

The perception of risk holds paramount significance in the assessment of road-crossing behavior. According to research conducted by Salvucci et al. (2019), the way in which individuals perceive traffic hazards and the likelihood of accidents has a direct impact on their decision-making when it comes to crossing roads. According to Jones et al. (2018), the standpoint of university students may be impacted by various aspects, including their exposure to traffic, familiarity with road regulations, and consciousness of road safety campaigns.

2. Traffic and roadway Factors:

The traffic-related factors of volume, speed, and signalization play a crucial role in influencing pedestrian conduct. According to Rahman et al. (2021), the road-crossing behavior of university students is affected by elevated amounts of traffic and increased speed. The accessibility and effectiveness of pedestrian crossings and signals can substantially impact the decision-making process of students (Hasan et al., 2020)

3. Presence of Friends:

The present study has demonstrated that the behavior of individuals when crossing roads is heavily influenced by their peers within the university setting. Such influence is considered to be significant. According to Ahmed et al. (2017), the presence of peers who exhibit risky road-crossing behavior increases the probability of students engaging in such behavior themselves. According to Mahmud et al. (2019), the phenomenon of peer pressure and the inclination to emulate others' conduct can potentially engender a lack of regard for traffic safety regulations.

4. Attitudes and Social norms:

Road safety perception and crossing conduct have a significant bearing on the decision-making of university students. Based on the findings of Hossain and Sultana (2018), individuals who possess a positive outlook toward traffic safety and perceive pedestrian crossing as a perilous activity are inclined to utilize more secure crossing methods. Furthermore, it is noteworthy that the cultural beliefs and norms of individuals can significantly shape their perceptions of road-crossing hazards and appropriate conduct (Nabi et al., 2022)

5. Individual traits:

Several distinct variables, including age, gender, and previous road-crossing experience, may significantly impact the road-crossing behavior of tertiary students. According to a recent study by Ali et al. (2020), female pedestrians exhibited higher levels of vigilance while crossing the street compared to their male counterparts. Similarly, individuals who exhibit a heightened understanding of roadway safety measures, in addition to those who have experienced close calls, exhibit a greater propensity to engage in safer crossing behaviors (Haque et al., 2019)

6. Time Restraints and Distractions:

Time constraints and external disturbances, such as mobile phone usage, can have an impact on the manner in which individuals traverse a roadway. As per the study conducted by Akter et al., university students exhibited a higher inclination towards engaging in risky conduct, such as crossing roads while being distracted, particularly when they were constrained by time or engrossed in the usage of their mobile devices. The year 2019. The amelioration of the aforementioned concerns could potentially be achieved by implementing educational programs and deploying efficacious time management strategies, thereby fostering practices of increased safety while driving.

7. Seasonal Variation:

The seasonal fluctuations may exert an influence on the manner in which college students navigate and traverse across the street. Monsoon seasons that are characterized by intense rainfall may result in waterlogging and reduced visibility, leading to the compromised ability of pedestrians to accurately judge the speed and distance of approaching vehicles. In a study conducted by Hossain and Rabbani in 2019, it was found that during the monsoon season, university students exhibit an increased propensity to traverse crossroads in unsafe manners, thus heightening the likelihood of vehicular mishaps.

8. Infrastructure and Road Conditions:

The quality of infrastructure and the state of road conditions significantly impact individuals' street-crossing behavior. The findings of Khan et al. 's study suggest that university students exhibit a higher propensity for engaging in hazardous behavior in the presence of poorly maintained thoroughfares, inadequate provisions for pedestrians, and inadequate street lighting. In the year 2017, in accordance with the customary practice of denoting the chronological sequence of years, a certain period of time was marked and determined by its specific temporal placement within the calendar system. Insufficiencies in crossing infrastructure, namely the lack of sufficient

footbridges and pedestrian crossings, are significant contributing factors to the inclination of students to traverse roadways in hazardous locations.

9. Vehicles amount and Speed:

The velocity and quantity of automobiles are pivotal variables that influence individuals' navigation of intersections. The utilization of marked crossings by pupils may be impeded by the intense vehicular flow and excessive velocity, which may culminate in hazardous practices like jaywalking. Rahman and Hossain (2019) revealed in their study that university students exhibit impulsive behavior when faced with heavy traffic and vehicles moving at high speeds, frequently choosing to crossroads in an erratic manner.

10. Waste and encroachments on the road:

The presence of refuse and trespass on thoroughfares can significantly influence the road-crossing behavior of college students. The findings of a study conducted by Islam et al. suggest According to a study conducted in 2018, the presence of street vendors or waste materials on sidewalks increases the likelihood of hazardous crossings of roadways by students. This practice serves to heighten consciousness of the imperative for effective waste management as well as regulations governing street vending operations. Moreover, it elevates the risk of mishaps.

The inclusion of these components is imperative in formulating targeted approaches to enhance pedestrian safety on university premises. Further investigation is necessary to comprehend the interrelations and complex associations among these components in order to formulate efficacious tactics for encouraging secure pedestrian crossing conduct among university students in Bangladesh.

2.4 Summary

The issue of road-crossing behavior among university students in Bangladesh has garnered attention due to the increasing prevalence of pedestrian-related collisions and fatalities. This paper presents a comprehensive overview of current research pertaining to this subject matter, highlighting key discoveries, methodological approaches, and pertinent theoretical constructs. An extensive comprehension of the road-crossing conduct of university students in Bangladesh can be attained by examining data from various research studies, thereby facilitating the formulation of pertinent interventions and policies.

A prior empirical investigation revealed that several factors play a pivotal role in shaping pedestrians' road-crossing conduct. The study by Rahman et al. (2018) reveals that the road-crossing behavior of university students is significantly impacted by factors such as gender, age, and previous road safety training. Essentially, the findings underscore the crucial need for targeted road safety education campaigns that take into account the demographic characteristics of the target population.

Extensive research has been focused on examining the impact of surrounding environments on pedestrian road-crossing behavior. Hossain and Rahman (2019) conducted an empirical investigation in which they explored the potential correlation between infrastructure quality and pedestrian behavior within the geographic context of Bangladesh. The examination of their research concluded that the incorporation of designated crosswalks, traffic signals, and pedestrian overpasses resulted in a notable increase in adherence to laws pertaining to pedestrian roadway crossing. The results of this study draw attention to the necessity of allocating resources toward enhanced infrastructure in order to augment pedestrian safety.

Substantial research has been conducted on identifying the psychological and cognitive factors that serve as pivotal determinants of road-crossing behavior. Akhtar et al. (Akhtar and colleagues) The study conducted in 2020 was designed to investigate the correlation between risk perception,

decision-making, and pedestrian behavior among university students in Bangladesh. Based on their research, individuals who possessed higher risk perception scores demonstrated increased cautiousness when traversing roadways. The present study suggests that interventions that aim to enhance risk perception and decision-making skills may have positive effects on promoting safer road-crossing practices.

Cultural and social factors have been identified as salient predictors of pedestrian crossing behavior on roads. The study conducted by Ahmed and Haque (2017) aimed to investigate the impact of social conventions on pedestrian conduct in Bangladesh. Based on the results revealed by their research, it was observed that individuals tended to conform to crossing norms that were established by the majority. The present study underscores the significance of employing social interventions and raising public awareness campaigns to influence and promote safer road-crossing practices.

Prior literature has emphasized the significance of multifaceted interventions that focus on various factors such as demographic characteristics, quality of infrastructure, perception of risk, decision-making processes, and prevailing social norms. Given the aforementioned concerns, policymakers and professionals involved in promoting road safety in Bangladesh can design targeted interventions aimed at cultivating safer road-crossing practices among individuals enrolled in tertiary education institutions.

3 Chapter – 03: Methodology

3.1 Introduction

Analysis of road-crossing behavior among university students in Bangladesh is a very significant field of study which addresses the factors affecting road-crossing behavior which would assist in the development of efficient road safety programs and strategies. This entire section discusses the method that was used to identify and assess the illegal road crossing behavior of university students in Bangladesh. Quantitative analysis method was utilized to gather information on illegal road crossings among university students as well as to examine information about university students' behavior when crossing the street. Patterns and links in the data were discovered using statistical analysis techniques such as logistic regression. A survey-based technique was used to collect data on multiple aspects of road crossing behavior, such as individual attributes, environmental variables, and cultural norms. Later, a logistic regression model was developed to determine the significant variables that directly impact the jaywalking behavior of students from universities.

3.2 Area of Study

University students of Bangladesh were the research's population of focus. A purposive sampling technique was used due to the disparity in the number of universities and the student population. Approximately 35 universities throughout Bangladesh were selected for the study based on factors such as geographic location, size, and representation of various topics. A practical sampling technique was used in order to select participants from each chosen university while covering each of the eight divisions of Bangladesh. Several students were interviewed on areas such as demographics, environmental circumstances, social norms, and safety knowledge. A pilot survey was carried out beforehand to the main study to clarify and discover any issues with understanding the questionnaire's questions. Some additional modifications were implemented to the questionnaire survey later.

3.3   Data Collection

To collect primary data, a systematic questionnaire designed specifically for this study was used. The questionnaire included both closed-ended and Likert-scale items to elicit data on numerous aspects of road crossing behavior. The survey was conducted through in-person interviews.

The research took into account an array of factors, including sociodemographic data (study year, gender, university location, etc.), accident experience (experience, trauma, death, etc.), safety education data (pedestrian signs, advice, participation), rules and regulations (road transport act and penalty), road and traffic data (road width, road side activities, traffic density, etc.), and situational data (seasonal variation, weather condition, waste disposal, etc.). The questionnaire that was provided was designed to capture all these parameters as well as any potential relationships between them.

The acquired data was analyzed using applicable statistical techniques. Descriptive statistics were utilized to characterize the demographics and road-crossing habits of the participants. Inferential statistical analysis, such as logistic regression, was used to evaluate the relationships between the indicated components and road crossing behavior.

To ensure ethical standards, each of the students gave informed consent before the data collection process, confidentiality as well as anonymity were maintained strictly during the survey, and students were provided the chance to withdraw themselves from the study at any situation during the survey.

Data was obtained from 434 students who were interviewed. A total of twenty students took part in the pilot survey. During the survey, 51 questions were asked, which were grouped into six subcategories: sociodemographic factors, accident experience, safety knowledge, situational information, and road and traffic information.

3.4   Logistic Regression

The response variable in our study, whether students are jaywalking, is a binary variable. As a result, logistic regression is an ideal method to apply as it was introduced to detect a binary dependent variable based on factors that can predict certain outcomes. If a dependent variable in a road safety study is binary, the logistic regression model is typically used. In this model, the logit is logarithm of the probability proportion that dependent variable is considered as 1 (jaywalking) instead of 0 (non-jaywalking).

The probability P of a possibility of jaywalking is,

$$Y = Logit(P) = ln\ (P\ /\ 1 - P) = (BETA.X)$$

BETA is a set of predicted parameters, and X is an array of variables which are independent. If an independent variable, Xi, rises by a single value while all other factors stay unchanged, the odds ratio (OR), which varies from 0 to positive infinity, increases. It denotes the proportion of the time that the probabilities of the outcome (JAYWALKING) climb (ODD RATIO > 1) or reduce (ODD RATIO 1) when the amount of the independent variable in question goes up by one unit.

For constructing a logistic regression model that identifies the factors that impact students at universities on an illegal road crossing, a historical data set of previous pedestrian fatalities was required, which included environmental factors, individual characteristics, roadway features, and situational factors that are associated with an illegal road crossing.

The biggest challenge in adopting the logistic regression model is to pinpoint pertinent variables from road characteristics, safety perception, traffic regulations, and external variables that could accurately forecast how to impact road crossing decision-making. To detect these parameters, several strategies were used. The initial approach was to study previous research in which these aspects had been thoroughly investigated. The second strategy was to establish other parameters that might have an impact on students' illegal road-crossing conduct. Another strategy used was to conduct a pilot survey with the goal of discovering additional variables that are directly engaged in university students' illegal road-crossing process.

3.5   Descriptive Statistics

The Descriptive Statistic of the study is given below. Here all the data were summarized.

Table 1: Sociodemographic Characteristics of Jaywalking among university students

1. Sociodemographic Characteristics			
Explanatory variables	**Description of the variables**	**Mean**	**Standard Deviation**
Gender	Male=1, Female = 0	0.612	0.488
Study Year			
First Year	First years = 1, otherwise=0	0.411	0.493
Second Year	Second Year =1, otherwise=0	0.106	0.308
Third Year	Third Year =1, otherwise=0	0.259	0.438
Fourth Year	Fourth Year =1, otherwise=0	0.194	0.396
Fifth Year	Fifth Year =1, otherwise=0	0.009	0.096
Masters	Masters =1, otherwise=0	0.021	0.143
Home district	Inside Dhaka=1, Outside Dhaka=0	0.236	0.425
Current Area	Inside Dhaka = 1, Outside Dhaka=0	0.764	0.425
Years spent in current Area			
2 years	2 years=1, otherwise=0	0.289	0.454
2-4 years	(2-4 years)=1, otherwise=0	0.141	0.348

4-15 years	(4-15 years)=1, otherwise=0	0.346	0.476
>15 years	(>15 years)=1, otherwise=0	0.224	0.417

Current Area to University Distance

(<2 km)	(<2 km)=1,otherwise=0	0.342	0.475
(2-4 km)	(2-4 km)=1, otherwise=0	0.109	0.311
(4-10 km)	(4-10 km)=1, otherwise=0	0.303	0.460
(>10 km)	(>10 km)=1,otherwise=0	0.247	0.432
University Location	Inside Dhaka = 1,Outside Dhaka = 0	0.746	0.436
Eye problem	Eye Problem = 1, No Eye Problem =0	0.506	0.501

Class Start Time

(7 AM_9 AM)	(7 AM_9 AM)=1, otherwise=0	0.582	0.494
(9 AM_11AM)	(9 AM_11AM)=1, otherwise=0	0.346	0.476
(11AM_1PM)	(11AM_1PM)=1, otherwise=0	0.053	0.225
(Later than 1PM)	(Later than 1PM)=1, otherwise=0	0.018	0.135

Class ending time

(10AM_12PM)	(10AM_12PM)=1, otherwise=0	0.012	0.107
(12PM_2PM)	(12PM_2PM)=1, otherwise=0	0.102	0.302
(2PM_4PM)	(2PM_4PM)=1, otherwise=0	0.397	0.490
(Later than 4PM)	(Later than 4PM)=1, otherwise=0	0.490	0.500

Mode of transport most frequently used

Walk	Walk=1, otherwise=0	0.300	0.459
Rickshaw	Rickshaw=1, otherwise=0	0.169	0.375
Bus	Bus=1, otherwise=0	0.344	0.476
Car	Car=1, otherwise=0	0.095	0.293
Bike	Bike=1, otherwise=0	0.028	0.164
Others	Others=1, otherwise=0	0.065	0.246
Need to cross road for university	Road Cross = 1, Not Road Cross = 0	0.654	0.476

Arrival time

Well ahead of class	Well ahead of class=1, otherwise=0	0.282	0.450
just in time	just in time=1, otherwise=0	0.614	0.487

late in class	late in class=1, otherwise=0	0.104	0.306
University travel per week			
(<2 times)	(<2 times)=1, otherwise=0	0.035	0.183
(2-4 times)	(2-4 times)=1, otherwise=0	0.212	0.410
(>4 times)	(>4 times)=1, otherwise=0	0.753	0.432

Table 2: Accident Experience of Jaywalking among university students

2. Accident Experience			
Explanatory variables	**Description of the variables**	**Mean**	**Standard Deviation**
Any previous accident experience	Accident Experience = 1, No Accident Experience = 0	0.480	0.500
Having any mental trauma due to accident	Mental Trauma = 1, No Mental Trauma = 0	0.319	0.467
Have witnessed any pedestrian accident	Witnessed = 1, Not Witnessed = 0	0.524	0.500
Any relative died due to accident	Relative Died = 1, No Relative Died = 0	0.293	0.456

Table 3: Safety Knowledge of Jaywalking among university students

3. Safety Knowledge			
Explanatory variables	**Description of the variables**	**Mean**	**Standard Deviation**
Where safety education was received			
School	School=1, otherwise=0	0.836	0.371
collage	Collage=1, otherwise=0	0.088	0.283
university	University=1, otherwise=0	0.076	0.266
How often look for traffic safety information			
never	never=1, otherwise=0	0.397	0.490
rarely	rarely=1, otherwise=0	0.309	0.463
sometimes	sometimes=1, otherwise=0	0.215	0.411
often	often=1, otherwise=0	0.065	0.246
always	always=1, otherwise=0	0.014	0.117
How often notice pedestrian signs before crossing			
never	never=1, otherwise=0	0.176	0.381
rarely	rarely=1, otherwise=0	0.224	0.417
sometimes	sometimes=1, otherwise=0	0.229	0.420
often	often=1, otherwise=0	0.217	0.413
always	always=1, otherwise=0	0.155	0.362
Have given anyone safety advice	Safety Advice Given = 1, No Safety Advice Given = 0	0.464	0.499
Have participated in any road safety training	Road Safety Training = 1, No Road Safety Training = 0	0.206	0.405
Where have you mostly obtained education			
TV	Tv=1, otherwise=0	0.303	0.460
Traffic safety week	Traffic Safety Week=1, otherwise=0	0.032	0.177
Traffic safety awareness	Traffic Safety Awareness=1, otherwise=0	0.051	0.220
Social media	Social Media=1, otherwise=0	0.469	0.500
Newspaper/e-paper	Newspaper/E-Paper=1, otherwise=0	0.145	0.353

Table 4: Situational Information of Jaywalking among university students

4. Situational Information			
Explanatory variables(factors in bold)	**Description of the variables**	**Mean**	**Standard Deviation**
A bridge is present, and you want to cross a road, at that time a group of people is crossing the same road at a mid-block section then what will you usually do?			
Join Group	Join Group = 1, otherwise=0	0.473	0.500
Foot over Bridge	Foot over Bridge = 1, otherwise=0	0.430	0.496
Cross Alone	Cross Alone = 1, otherwise=0	0.097	0.296
Does Seasonal variation affect your road-crossing behavior?	Yes = 1, No = 0	0.383	0.487
Does weather conditions affect your road crossing behavior?	Yes = 1, No = 0	0.554	0.498
Does the presence of your friends affect your crossing behavior?	Yes = 1, No = 0	0.649	0.478
Suppose you are never late for class but unfortunately you got late and you are about to cross a road. What will you do?			
Cross Without Wait	Cross Without Wait = 1, otherwise=0	0.309	0.463
Foot over bridge	Foot over bridge= 1, otherwise=0	0.212	0.410
Zebra Cross	Zebra Cross = 1, otherwise=0	0.259	0.438
Intersection	Intersection = 1, otherwise=0	0.219	0.414
How much time do you take to decide before initiating a crossing?			
(5_10s)	(5_10s) = 1, otherwise=0	0.273	0.446
(10_15s)	(10_15s) = 1, otherwise=0	0.282	0.450
(15_20s)	(15_20s) = 1, otherwise=0	0.000	0.000
(>20s)	(>20s) = 1, otherwise=0	0.446	0.498
Does the presence of traffic police influence your road-crossing behavior?	Yes = 1, No = 0	0.476	0.500
When do you usually cross a road?			

University	University = 1, otherwise=0	0.533	0.499
Shopping	Shopping = 1, otherwise=0	0.125	0.331
Tuition	Tuition = 1, otherwise=0	0.102	0.302
Others	Others = 1, otherwise=0	0.176	0.381
When your classes are finished and you are not in a hurry, does this influence your decision-making in crossing?	Yes = 1, No=0	0.464	0.499
Suppose there is no specific traffic signal/sign/road crossing facility on a road. What would you do in this situation?			
Police Help	Police Help = 1, otherwise=0	0.210	0.408
Cross with Friends	Cross with Friends = 1, otherwise=0	0.344	0.476
Cross Alone	Cross Alone = 1, otherwise=0	0.446	0.498
Does the presence of a safe gap (distance between you and the approaching vehicle) affect your crossing behavior?	Yes = 1, No = 0	0.852	0.355
Does the speed of the vehicle on the road affect your crossing behavior?	Yes = 1, No = 0	0.905	0.293
Suppose you are late for class, and you are running out of time. You need to cross the road to reach your university. As you have little time in hand how would you cross the road?			
Cross Without Wait	Cross Without Wait = 1, otherwise=0	0.139	0.346
Wait and Cross	Wait and Cross = 1, otherwise=0	0.649	0.478
Use Pedestrian Facility	Use Pedestrian Facility = 1, otherwise=0	0.212	0.410
Does the traffic density influence your decision-making about crossing the road?	Yes = 1, No = 0	0.829	0.377
Does the presence of wastes disposals affect your crossing behavior?	Yes = 1, No = 0	0.711	0.454
Does the presence of road blockades affect your crossing behavior?	Yes = 1, No = 0	0.818	0.387

Table 5: Road and Traffic Information of Jaywalking among university students

5. Road and traffic information			
Explanatory variables	**Description of the variables**	**Mean**	**Standard Deviation**
Distance between nearest facilities and University			
(0.05 to 0.5 km)	(0.05_0.5 km)=1, otherwise=0	0.434	0.496
(0.5 to 1 km)	(0.05_1 km)=1, otherwise=0	0.212	0.410
(1 to 5 km)	(1_5 km)=1, otherwise=0	0.289	0.454
(>5 km)	(>5 km)=1, otherwise=0	0.065	0.246
Does road width affect road crossing	Yes = 1, No = 0	0.707	0.456
Satisfied with overall condition of pedestrian facilities			
Good	Good=1, otherwise=0	0.106	0.308
Not Good	Not Good=1, otherwise=0	0.360	0.481
Average	Average=1, otherwise=0	0.303	0.460
The traffic density on the road you usually cross			
Heavy traffic	Heavy traffic=1, otherwise=0	0.455	0.499
Light traffic	Light traffic=1, otherwise=0	0.404	0.491
Congested condition	Congested traffic=1, otherwise=0	0.141	0.348
How often do you face roadside activities while crossing road			
never	never=1, otherwise=0	0.201	0.401
rarely	rarely=1, otherwise=0	0.411	0.493
sometimes	sometimes=1, otherwise=0	0.275	0.447
often	often=1, otherwise=0	0.097	0.296
always	always=1, otherwise=0	0.016	0.126
The presence of construction material influences decision	Yes=1, No=0	0.758	0.429
Do vehicle type influence decision making			
always	always=1, otherwise=0	0.471	0.500
sometimes	sometimes=1, otherwise=0	0.418	0.494
never	never=1, otherwise=0	0.111	0.314
When you walk along the road you use	pedestrian footpath=1, Outlane of the road=0	0.806	0.396

Table 6: Rules and Regulations of Jaywalking among university students

6. Rules and Regulations			
Explanatory variables(factors in bold)	**Description of the variables**	**Mean**	**Standard Deviation**
Do you know about the road transport act 2018	Yes=1, No=0	0.275	0.447
Do you know about the fine for illegal jaywalking	Yes=1, No=0	0.335	0.472

4   Chapter – 04: Analysis and Results

4.1   Introduction

Concern has been raised regarding the behavior of university students crossing roads in highly populated urban regions for a considerable period. Due to the swift expansion of urban areas and the increasing number of cars on the road, ensuring efficient transportation systems has raised serious worries regarding pedestrian safety. Having a comprehensive grasp of the factors that affect how pedestrians behave while crossing the road is paramount in designing successful strategies and promoting secure methodologies.

This segment of the study focuses on the way university students in Bangladesh crossroads and places particular attention on detecting any tendency towards illegally crossing the street. The central objective of this study is to examine the influences that impact the decision-making process of university students when crossing roads, specifically regarding the illegal action of jaywalking. A logistic regression model was employed to examine various attributes and their associations with the propensity to commit jaywalking.

Earlier research demonstrated that several variables impact the way individuals cross the road on foot. One instance would be the research conducted by Smith and colleagues. The probability of jaywalking was studied by Johnson and Brown (2019) as well as (2018), who analyzed the effects of street features, foot traffic, pedestrian traits, and surroundings. This analysis seeks to illuminate the particular factors that impact the road-crossing behavior of university students in Bangladesh by incorporating relevant data and contextual information.

This study employs a logistic regression model that assesses the likelihood of pedestrian crossing based on various independent variables. Data for this analysis was gathered from a thorough questionnaire completed by college students from multiple regions in Bangladesh. The research inquired about statistical information, patterns of crossing roads, perceptions of safety regulations, and viewpoints on traffic situations.

The aim of this research is to identify key factors that contribute to jaywalking actions among college students, through the analysis of gathered information and the application of logistic regression methodology. The conclusions drawn from the study will impact the creation of specific interventions and instructional initiatives aimed at enhancing the safe road-crossing practices of this group.

In essence, this section summarizes the findings and evaluations of studies on how university students in Bangladesh crossroads. Logistic regression will be used to identify factors associated with a proclivity to cross the street unlawfully. The study intends to offer important information on factors affecting the road crossing behavior of students, drawing on past research and the unique situations encountered by students in Bangladesh. The following sections provide an explanation and representation of the data, emphasizing its importance in taking action to improve road safety.

4.2   Model Development

When assessing the road-crossing behavior of students, the establishment of a model is vital for understanding the factors that contribute to their likelihood to jaywalk. The following section explains the procedures required in developing a logistic regression model that considers socio-demographics, accident history, safety awareness and perception, and traffic circumstances. The approach considers discrete, continuous, and categorical variables. The primary statistical method employed was logistic regression, and the statistical analysis was carried out with the help of both Microsoft Excel and STATA 15.

In order to start the analysis, a logistic regression approach was found to be the most suitable model. "Logistic regression is often employed for evaluating multimodal results, making it a suitable method for investigating the proclivity to engage in jaywalking." This method allows us to investigate the relationship between the predictors and the likelihood of crossing the street unlawfully.

The components of the model were selected based on their potential impact on pedestrian crossing behavior. The set of variables was segregated into four distinct groups, namely socio-demographics, accident incidence, awareness of safety and perception, and traffic conditions. In previous research, various socio-demographic factors, such as age, gender, education, and income level, have been recognized as potential indications of jaywalking conduct (Smith et al., 2018; Johnson, 2019).

In order to gauge the influence of past traffic-related events on the likelihood of jaywalking, variables related to prior accident experiences were taken into account. One of the variables that might contribute to personal accident insurance is familiarity with accidents either through personal experience or through the experiences of those close to us. An evaluation was conducted using safety knowledge and perception criteria to gauge the participants' comprehension of road safety measures and their attitude toward the potential hazards linked with jaywalking. Earlier research has established a connection between jaywalking conduct and one's perception and knowledge concerning safety, as per studies conducted by Lee et al. in 2017 and Chen & Chao in 2020.

Due to their direct influence on the likelihood of jaywalking, traffic circumstances were considered crucial. To consider how the traffic conditions in the vicinity affect the way people cross roads, factors including the amount of traffic, the type of road, the existence of pedestrian crossings or traffic signals, and the average speed of vehicles were taken into account in studies conducted by Wu et al. in 2016 and Li and Li in 2021.

The examination encompassed three groups of factors namely categorical, continuous, and discrete variables. Factors that are distinct, like age or the number of prior accidents, were treated as numerical variables having discrete values. Numerical values on a continuous scale, such as those denoting traffic volume or perceived risk levels, were utilized to represent continuous variables. The discrete entities of gender and educational background were encoded using suitable methods, as stated by Tabachnick & Fidell (2019).

Prior to conducting statistical analysis, Microsoft Excel was employed for initial data handling tasks, including data cleansing, recording, and transformation. The data was cleansed and subsequently uploaded into STATA 15 to undergo logistic regression analysis. STATA 15 is equipped with robust functionalities to execute logistic regression models and produce valuable statistical results.

To guarantee the dependability and authenticity of the examination, we took essential measures to tackle any interfering variables and regulate relevant factors. To evaluate the effectiveness and resilience of the suggested approach, the utilization of multicollinearity and model fit statistics was adopted (Agresti, 2015).

Ultimately, the process of constructing the model involved choosing logistic regression as the most effective analytical approach, in addition to incorporating a multitude of factors such as socioeconomic status, history of accidents, knowledge, and perception of safety, and various aspects relating to traffic conditions. Various types of predictors, such as discrete, continuous, and categorical variables, were examined in order to accurately capture their diverse nature. To ensure reliable and valid results, both Microsoft Excel and STATA 15 were utilized for the purpose of statistical analysis.

4.3   Analysis and Result

Based on the p-values of the t-tests, 39 variables from 25 factors were found to be significant ($p \leq 0.05$) or marginally significant ($p \leq 0.1$). Maximum significant variables were found in the sociodemographic section while the accident experience information and information of rules and regulation had the least number of significant variables. The estimated result is given in a table:

Table 7: Estimated Results

Sections	Variables	Odd ratio	P Value
Sociodemographic Information	**Gender**		
	Male	0.487	0.028
	Study Year		
	First Year	2.861	0.002
	Fourth Year	0.091	0.018
	Years spent in current area		
	(2-4 years)	2.083	0.061
	(4-15 years)	0.484	0.063
	Current Area to University Distance		
	(<2 km)	2.871	0.001
	(4-10 km)	0.355	0.022
	(>10 km)	0.383	0.050
	Eye problem		
	Yes	2.360	0.014
	Mode of transport most frequently used		
	Rickshaw	2.473	0.012
	Need to cross road for university		
	Road Cross	0.442	0.013
	Arrival time		
	Well ahead of class	2.310	0.011
	Just in time	0.310	0.001
	Late in class	2.251	0.059
Accident Experience	**Having any mental trauma due to accident**		
	Mental Trauma	3.240	0.000
Safety Education Information	**How often do you look for traffic safety information on your smartphone?**		
	never	1.966	0.039
	always	4.838	0.074

	How often do you notice pedestrian signs before crossing a road?		
	rarely	2.093	0.032
	often	0.163	0.013
	Have given anyone safety advice		
	Yes	0.545	0.077
Situational Information	**Suppose a foot-over a bridge is present and you want to cross a road, at that time a group of people is crossing the same road at a mid-block section then what will you usually do?**		
	Join Group	1.925	0.050
	Use Foot over Bridge	0.499	0.051
	Does Seasonal variation affect your road-crossing behavior?		
	Yes	0.540	0.092
	Suppose you are never late for class but unfortunately you got late and you are about to cross a road. What will you do?		
	Cross Without Wait	1.778	0.082
	How much time do you take to decide before initiating a crossing?		
	(10_15) sec	2.310	0.011
	(>20) sec	0.407	0.014
	When do you usually cross a road?		
	Shopping	2.872	0.006
	Suppose there is no specific traffic signal/sign/road crossing facility on a road. What would you do in this situation?		
	Cross with Friends	0.351	0.014
	Cross Alone	3.088	0.001
Road and Traffic Information	**Satisfied with overall condition of pedestrian facilities**		
	none	2.846	0.001
	The traffic density on the road you usually cross		
	Heavy traffic	0.341	0.004
	Light traffic	1.903	0.049
	How often do you face roadside activities while crossing road		
	often	2.959	0.009
	always	3.860	0.113
	The presence of construction material influences decision		
	Yes	0.538	0.071
	No	1.858	0.071
	Do vehicle type influence decision making		
	always	0.594	0.123
	When you walk along the road you use		
	pedestrian footpath	0.271	0.000
	outline of the road	3.693	0.000
Rules and Regulations	**Do you know about the fine for illegal jaywalking**		
	Yes	0.436	0.042
	No	2.292	0.042

Female students were found to be more likely to jaywalk than male students (odds ratio = 0.486) in this study. Male pedestrians are less patient and more likely to jaywalk than female pedestrians. According to the research year, first-year students were more likely to jaywalk than second, third, and fourth-year students. Students who have lived in their institution's city for at least 15 years are 48% less likely to be detected jaywalking. Students who live between 4 and 10 kilometers and more than 10 kilometers from their university are 35% and 38% less likely to engage in jaywalking, respectively.

Students who did not wear glasses had a 42% reduced likelihood of jaywalking than those who did. This method of transportation has a substantial impact on jaywalking, with rickshaws being the most likely to begin a jaywalk while crossing a road. Students who arrived at university early were more likely to jaywalk than those who arrived late or just in time for class. According to the findings of this study, pupils who have never experienced emotional trauma as a result of a traffic accident are 30% less likely to engage in jaywalking than those who have. Furthermore, pupils who continuously check their smartphones for traffic safety information are roughly five times more likely to jaywalk than those who do not.

Furthermore, students who frequently check for traffic signs before crossing the street are 16% less likely to jaywalk than those who rarely check for traffic signs. Finally, pupils who encounter seasonal change when crossing the street are half as likely as other students to jaywalk. These data imply that mental trauma from traffic accidents has a positive effect on unlawful road crossing behavior. Students who are late for class and must cross the street without waiting are nearly twice as likely as those who spend less time. Students who take 10-15 seconds to begin crossing are 2.3 times more likely to jaywalk than those who take less time.

Students who cross the street frequently for shopping are roughly three times more likely to jaywalk than those who do not. Students who walk alone across the street are more likely to jaywalk than those who walk with friends. When there is light traffic, students who are neutral about the satisfactory level of pedestrian amenities are 2.84 times more likely to jaywalk than those who are not. When students are constantly confronted with roadside activities while crossing the street, they are more inclined to jaywalk.

Jaywalking is reduced by 46% when construction materials are used. Students who continually assess the type of vehicle they are about to cross the street. Students who use pedestrian walkways are less likely to engage in jaywalking. Students who are aware of the fine are less likely to jaywalk than those who are not (OR=0.44).

5   Chapter – 05: Conclusion

5.1   Introduction

The study aims to identify the factors that affect the illegal road crossing behavior among university students of Bangladesh. To fulfil the objective of the study a logistic regression model was developed where different dependent variables such as sociodemographic characteristics, accident experience, situational information of the university students was taken as input and the possibility of illegal road crossing of the students was analyzed. The outcome of the logistic regression is a binary dependent variable which indicates the decision-making process of the students while crossing a road. A questionnaire survey was used to collect data from students regarding sociodemographic information, situational conditions, safety education and other related parameters. The finding of the study is made from the response obtained from 434 students who participated in the survey process. The most significant variables that obtained from the statistical method are gender, study year, current living area, proximity to university, eye problem, mode of transportation, time of arrival to university, mental trauma, use of smartphone, attention to traffic signs, level of safety knowledge, use of pedestrian facilities, seasonal variation, waiting time, location of crossing, presence of friends. The result of this result strongly indicates that using foot over bridge and other pedestrian facilities can reduce the likelihood of crossing road. Further findings also suggest that use of smartphones can negatively influence the decision-making process while crossing roads. This study included two variables that were not identical to existing literature. For starters, seasonal variation, which had not been considered in previous studies, had a significant impact on university students' decision-making process. Another one is the eye problem. Students with vision problems are 58% more likely to jaywalk. Surprisingly, Female students demonstrated greater risky conduct and they were more prone to jaywalking which is absolutely opposed to past findings. As a result, these factors would aid in understanding university students' behavior while crossing the street.

5.2   Policy Implementation

The study's findings will aid in policy formulation and, overall, will improve the safety of young pedestrians. The study's findings back up previous research findings on pedestrian demographic features who were mostly implicated in traffic infractions. The current study found that first-year students were the most dangerous pedestrian age group, which is consistent with the findings of other studies (Daz, 2002; Jennifer Martin, 2016). Furthermore, previous research has shown that the presence of friends influences individual students' decision-making processes (Xie, 2017). Another significant finding from the current study was the jaywalking tendency among the students who cross the road alone. Moreover, Students facing roadside activities while crossing the road are more likely to cross roads without waiting. Apart from the situational characteristics, seasonal variation and arrival time to university had positive correlation with jaywalking. Hence Policymakers will be able to identify the most vulnerable socio-demographic group among university students who need traffic safety education. The results of the analysis will be useful in assisting university officials in organizing safety-related seminars/events. Authorities at the university will be able to persuade regulatory entities to improve local pedestrian amenities. New provisions/acts/laws addressing the safety of the country's youth generation can be drafted.

5.3   Limitation and Future Scope

This study has certain limitations. Further advancement that can be ventured from this study is presented as future scope in this subsection.

1. The study is covered 35 universities across Bangladesh. For further study the number of universities can be increased to get bigger picture of the situation

2. In this study, data is collected through a questionnaire survey and 434 respondents took part. In future the number of respondents can be increased, and data can be collected from specific locations where jaywalking is predominant.

3. In this study, the focus on the decision-making process of students who cross road illegally. In future, study can be conducted regarding the impact of students and vehicle collisions on the road network and operations.

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