Master of Science in Public Health

Pattern of road traffic injuries and management capacity of tertiary care hospitals of Gilgit-Baltistan

By

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(2021-23)

Pattern of road traffic injuries and management capacity of tertiary care hospitals of Gilgit-Baltistan

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Dissertation submitted in partial fulfillment of the requirement for the degree of:

MASTER OF SCIENCE IN PUBLIC HEALTH (2021-23)

To

Al-Shifa School of Public Health, PIO, Al Shifa Trust Eye Hospital,
Faculty of Medicine
Quaid-i-Azam University,
Islamabad.

Word Count: 12208

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This dissertation is the result of an independent investigation. Where my work is indebted to others, I have made acknowledgments.

I declare that this work has not been accepted in substance for any other degree, nor is it currently being submitted in candidature for any other degree.

(Prof. Dr. Ume Sughra)

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ABSTRACT

Background: Road traffic injuries (RTIs) are considered among the leading public health concerns especially in the developing countries like Pakistan. It has considerable impacts on the economy and productivity of communities. Effective implementation of safety measures and efficient management of traffic accidents can only be achieved through multi-disciplinary approach.

Objectives: This study was conducted to assess the pattern of road traffic injuries and management capacity of public sector tertiary care hospitals of Gilgit-Baltistan. It also explored the association of RTIs with socio-demographic variables and potential risk factors.

Methodology: A cross-sectional study was carried out in the public sector tertiary care hospitals of Gilgit-Baltistan. A total of 386 RTI patients were consecutively selected for the purpose of the study. Data about RTI patients were collected through an adapted questionnaire while, WHO situational analysis tool for EESC was used to assess the capacity of health facilities. Chi-square of Independence was applied to check the association of RTIs with socio-demographic and risk factors.

Results: Among the 386 respondents, males 310 (80.3%) were more commonly involved than females 76 (19.7%). The highest number 148 (38.3%) of victims were between 16 and 30 years of age. There was significant association between injury severity score (ISS) and socio-demographic variables (p value <0.05) like gender, age, education level, and occupation. High speed, type of vehicle, use of seat belt, location of accident, and unlicensed drivers were the main risk factors which were found strongly associated (p value <0.05) with ISS and nature of injury. Health facilities were generally lacking disposable surgical items and were facing power shortage across the province.

Conclusion: Recent developments in communication infrastructure are considerably influencing the dynamics of Gilgit-Baltistan. Road traffic accidents are increasing in the region which needs the attention of policy makers and concerned stakeholders. Young people without proper license and knowledge of traffic rules are being reported with traffic injuries. Strict implementation of traffic rules, speed regulation, and scientific designs of roads are needed to avoid the RTA catastrophe. This study revealed that use of helmet and seat belt is

almost negligible in Gilgit-Baltistan. Therefore, head and neck injuries along with fractures and multiple injuries are frequently reported. Provincial government is introducing many reforms in the health sector yet majority of the health facilities are lacking human resource, disposable surgical items and uninterrupted power supply.

Keywords: Road traffic accidents, Road traffic injuries, Management capacity, Tertiary care hospitals, risk factors, Gilgit-Baltistan

ACKNOWLEDGMENTS

First and foremost, praises and thanks to Allah Almighty, for His showers of blessings throughout my educational journey and to complete this thesis successfully.
Words cannot express gratitude to my supervisor, **Prof. Dr. Ume Sughra**, Director Research, Al-shifa School of Public Health Rawalpindi, for providing invaluable guidance and support in spite of her busy routine. Your optimism, sincerity and motivation have deeply inspired me. I feel so lucky and honored to have had a teacher like you. Thank you for helping me to express my creative side and come out of my shell. You have given me a confidence that is priceless!

I would like to thank all my respected teachers**Dr. Ayesha Babar, Dr. Saman Naqvi, Dr. Khizar Nabeel, Dr. Qurat ul Ain, Ms. Qandeeel, and Dr. Ahmed** for giving me the strength I needed to take the next steps towards my professional goals.

I am grateful to**Dr. Muhammad Imran**, Consultant Surgeon, RHQ Hospital Gilgit and administration of all regional hospitals of GB for providing me with the opportunity to conduct my research and for all of the resources and support. I owe gratitude to **Dr.Faiyaz Alam, Dr. Amjad, Dr. Alia,Dr. Kacho Ahmed, and Ms. Numra** who went above and beyond to help me with my work.

I am deeply thankful to my friends and family for their love and support during this process. Without their encouragement and motivation, I would not have been able to complete this project.

(Muhammad Ibrahim)

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AAAM	Association for the Advancement of Automotive Medicine
AIS	Abbreviated injury scale
ACLS	Advanced cardiovascular life support
BLS	Basic life support
CHD	Coronary heart diseases
EESC	Emergency and Essential Surgical Care
GB	Gilgit-Baltistan
GIEESC	Global Initiative for Emergency and Essential Surgical Care
ISS	Injury severity score
RTA	Road traffic accident
RTI	Road traffic injury
SPSS	Statistical Package for Social Science
WHO	World Health Organization
YLD	Years lived with disability
YLL	Years of life lost

Chapter I: Introduction

Road traffic accidents are a primary public health concern and a leading global cause of death and injury. According to the World Health Organization (WHO), road traffic accidents are the eighth leading cause of death worldwide, causing approximately 1.35 million deaths every year. It represents nearly 3,700 deaths per day, or one death every 24 seconds. Moreover, road traffic accidents also cause nonfatal injuries to almost 50 million people each year (WHO 2013).

The prevalence of road traffic accidents varies by region, with the highest rates (93%) of road traffic deaths occurring in low and middle-income countries (WHO 2013). In these countries, road traffic accidents are a leading cause of death for people of all ages but are particularly common among young people (Singh et al. 2017). In addition to the human toll of road traffic accidents, they also have a significant economic impact, with the cost of road traffic deaths and injuries estimated to be in the hundreds of billions of dollars annually. Pakistan is no exception to this worldwide dilemma, with the highest incidence of road traffic accidents in recent years. 60% of Pakistan's population is youngsters out of which 5 dies every day due to road traffic accidents making Pakistan rank at 67th place (Khan, 2018).

According to a report by World Health Organization, 25,781 road traffic accident deaths occurred in 2013. Additionally, according to available data for 2009 to 2020, a total of 104,105 accidents are reported in Pakistan, including 44,959 fatal and 59,146 non-fatal accidents. Due to these accidents, 55,141 people have died, while 126,144 were found injured. A total of 120,501 vehicles were involved in these accidents causing heavy material loss (*Traffic Accidents (Monthly) | Pakistan Bureau of Statistics*, 2020).Considering a meager follow-up reporting culture, it can be hypothetically believed that these accidents, deaths, and numbers of injuries are just the tip of the iceberg, and actual figures would be even more heart-wrenching. During the last decade, over 55,000 precious lives have been lost in road accidents. This

number reflects reported cases only, whereas there could be a significant number that has not been registered through provincial police departments. Already accident cases from AJK and Gilgit-Baltistan are not registered in this report.

Gilgit-Baltistan is situated in the north of Pakistan, covering an area of over 72,971 km2 (28,174 sq mi), and is highly mountainous. It had an estimated population of 1.8 million people in 2015. Its capital city is Gilgit (est. population 300000). The region is home to five of the 14 highest peaks in the world (K2, Nanga-Parbat) and additionally has more than fifty mountain peaks above 7,000 meters (23,000 ft.). Three of the world's longest glaciers outside Earth's Polar Regions are in Gilgit-Baltistan (Anila A. et al. 2020).

Figure 1: Map of Gilgit-Baltistan

Harsh weather conditions, insufficient communication infrastructure and scattered population in mountainous valleys are seemingly the main causes of unsatisfactory human development indicators. Agriculture, employment in government organizations and small scale businesses are the traditional sources of income in the region (Farhan et al.2022). However, tourism sector

is emerging as a potential attraction for earning among the unemployed youth. The main tourism activities are climbing, trekking, cold desert safari, winter hockey on ice and hunting. Recent improvement in communication infrastructure and arrival of internet is considerably gaining the attention of national and international tourists. This industry has been growing in importance throughout the region (Ullah S. et al 2020).

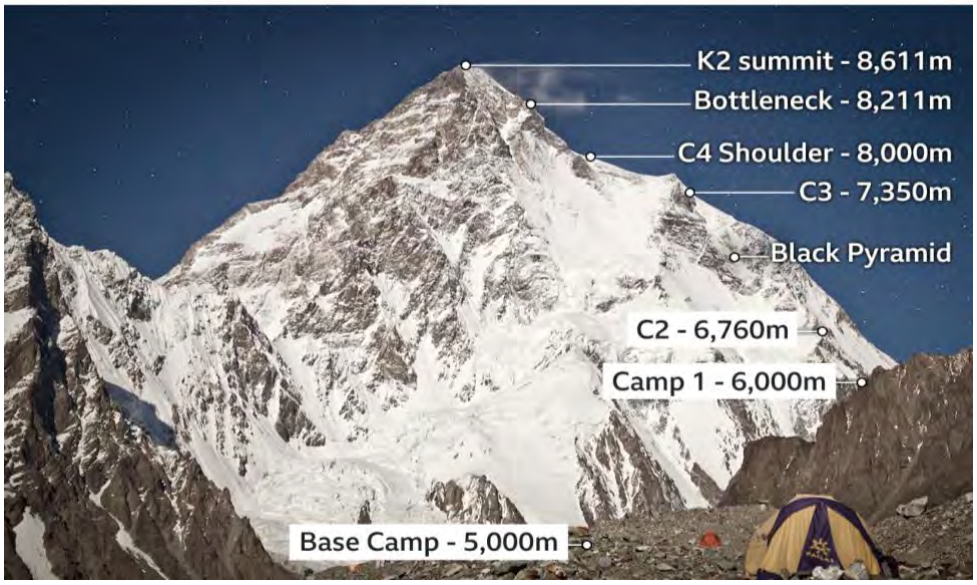

Figure 2:K-2, the second highest peak in the world.
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In addition to the mountainous terrain, other factors like seasonal migration, China Pakistan Economic Corridor (CPEC), and business opportunities are drastically influencing the population dynamics. As a result, challenges are also increasing. Road traffic injuries are one of the serious challenges for law enforcement agencies and the healthcare system in Gilgit-Baltistan (Mehmood S. et al. 2020).

Figure 3: The Karakoram Highway
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Important factors involved in road traffic accidents are human errors such as reckless driving, driver distraction, unlicensed driver, impairment (driver under the influence of drugs or alcohol), questionable vehicle maintenance and poor road infrastructure. Road traffic injuries have a great impact on personal, family and community level. The severity of the impact at personal and family level varies depending on the severity of injuries and it could be measured using Abbreviated injury scale (AIS). AIS is a code developed by Association for the Advancement of Automotive Medicine (AAAM) to describe and rank injuries. It has 6 points with one being a minor injury while 6 being a major injury. This code can only be used for nonfatal injuries and not for fatal injuries.

Access to surgical care and the burden of surgical disease have historically been neglected by the global health community. Surgical disease contributes to at least 11 percent of the global burden of disease and more than 25 million disability-adjusted life-years. According to a report, 5 billion people lack proper anesthesia and surgical care when required (Meara et al., 2015). Disparities in the availability of operating theatres and essential surgical equipment are profound, with more than two billion people in low-income countries estimated to lack access to basic, lifesaving surgical care.

In 2005, the World Health Organization (WHO) Global Initiative for Emergency and Essential Surgical Care (GIEESC) was established, encouraging collaborations aimed at reducing mortality and morbidity from critically treatable conditions. The GIEESC has published a situational analysis tool to characterize surgical capacity in low- and middle-income countries (WHO, 2005).

Rationale

Road traffic injuries cause considerable economic losses to individuals, their families, and nations. These losses arise from the cost of treatment, automobiles and loss of productivity for those 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 crashes cost most countries 3% of their gross domestic product.

The present study assessed the pattern, risk factors, and fundamental determinants of road traffic injuries in Gilgit-Baltistan. Moreover, it also highlighted the management capacity of these injuries in 4 tertiary care hospitals. It was the first study of this type in the region since the evidence-based findings are beneficial for advocacy in minimizing the potential risk factors and developing interventions at community and government levels.

1.2 Objectives

- To determine the pattern of road traffic injuries (RTIs) in Gilgit-Baltistan.
- To assess the management capacity of tertiary care hospitals for road traffic injuries.
- To find out the association between the pattern of RTIs and socio-demographic factors

Chapter II: Literature Review

Road traffic accidents pose a serious threat to the world population. It can cause fatal and non-fatal injuries resulting in lose to personal and social and life as well as impairment to economic growth of a country. Many studies have been conducted to determine the risk factors associated with road traffic accident and management of road traffic accident. Following is a brief illustration of various international and national studies which explore the important aspects of road traffic accidents.

2.1 Global Burden of road traffic accident

The burden of road traffic accidents can be expressed as Disability Adjusted Life Years (DALYs) that has been used in many studies as a health indicator. The burden of road traffic accidents is divided into disability and mortality. Disability as a result of road traffic injuries is expressed in Years of Life Lost (YLL) while mortality is expressed in Years Lived with Disability (YLD). A report by Global Burden of Disease in 2013 stated that road traffic accidents accounts for 64.1 million YLL and 8.6 million YLD globally. Furthermore, according to the World Health Organization (WHO), road traffic accidents are the leading cause of death for people aged 15-29 years old and are approximated to cause an estimated 1.35 million deaths each year worldwide. It is assessed that by 2030, road traffic accidents will cause 3 million deaths and 7.4 million injuries due to road traffic accidents.

In addition to the human toll, road traffic accidents also have a significant impact on the economy, with the cost of death, injury, and property damage estimated to be around 3% of the world's gross domestic product. It also contributes toward psychological problems such as acute stress disorder or post-traumatic stress disorder. It also affects the victims' their families' professional and social relations due to various reasons such us sick leave due to injury, missing school, or work to take care of the patient etc.

The prevalence of road traffic accidents varies widely depending on several factors, including the level of development of the country, the quality of road infrastructure and vehicles, and the level of enforcement of traffic laws.

The global burden of road traffic accidents is not evenly distributed, with low- and middle-income countries experiencing a disproportionate number of fatalities and injuries. In these countries, a lack of investment in road safety infrastructure and enforcement of traffic laws, combined with poor road conditions and vehicles that are not up to standards, contribute to the high number of road traffic accidents. A study by World Bank concludes that controlling and managing road traffic accidents would help low and middles income countries to gain long term income. It shows how it will help in the economic growth, as investment in road safety leads to investment in human capital.

In developed countries, road traffic accidents are less common than in developing countries, but the consequences of road traffic accidents are often more severe due to higher speeds and greater use of vehicles.

2.2 Risk factors associated with road traffic accidents.

2.2.1 Driver's behavior

It can include factors such as reckless or dangerous driving, which include speeding, tailgating, aggressive driving, driving under the influence of drugs or alcohol, and distracted driving, which includes texting, using a cell phone, eating, or engaging in other activities that take the driver's attention away from the road. A study conducted in Saudi Arabia in 2018 showed that 67% of road traffic accidents happened due to driver behavior (Touahmia, 2018)

2.2.2 Road design and infrastructure

Poor road design, inadequate signage and lighting, and lack of pedestrian crossings can all increase the risk of road traffic accidents. Research showed 29% of road traffic accidents occurred due to poor road design (Touahmia, 2018).

2.2.3 Weather conditions

Weather conditions such as rain, snow, and ice can contribute to the risk of road traffic accidents, as can road conditions such as potholes and debris. A study conducted in 2020 analyzed that during monsoons, the number of road traffic accidents is the highest due to slippery and damaged roads followed by winters (Kumar et al., 2020). Another study conducted in Iran analyzed that the percentage of RTA is the highest in summer. The difference could be due to different geographical patterns (Taravatmanesh et al., 2018).

2.2.4 Socioeconomic factors

People who live in lower-income communities or are less educated are more likely to be involved in road traffic accidents. According to the World health organization, deaths due to road traffic accidents are higher (more than 90%) in lower and middles income countries. Moreover, A study conducted in Indonesia concluded that people having a low level of education were affected more due to road traffic accidents (Zainafree et al., 2022).

2.2.5 Vehicle factors

The type, age, and maintenance of a vehicle can all contribute to the risk of a road traffic accident. This can also include faulty brakes, tires, or other vehicle components that can increase the risk of accidents. Research conducted in Saudia Arabia analyzed that 4% of Road traffic accidents occurred due to poor vehicle maintenance (Touahmia, 2018)

2.2.6 Age

Young drivers and elderly drivers are often considered to be at higher risk of being involved in road traffic accidents. Almost all the studies related to risk factors associated with road traffic accidents concluded that young people are at higher risk of mortality due to RTA as compared to others (Heydari et al., 2013). However, a few studies also showed that 20 to 39 years old people are also critical risk factors (Borrell, 2005)(Jha et al., 2004).

Sumita Sharma et al. carried out a cross sectional study during a period of August 2019 to November of 2019 at a tertiary care hospital of Eastern India to assess the epidemiology of road traffic accidents. Data related to socio-demographic profile, pattern of injury, and factors responsible for accident were collected and analyzed using Statistical Package for Social Sciences (SPSS) software version 20.0. A total of 147 participants were involved in the study. Out of all road traffic accidents, the highest percentage was due to human factors which was 33.34%. Both environmental and human factors were involved in 17.68% of road traffic accidents followed by all three factors (human, environment and vehicle) with 15.65%. The percentage for RTA of male was 81% having mean age 36.6 ± 13.67 years.

Mitra et al. conducted a cross-sectional study to determine the pattern of road traffic accident in-patients of a tertiary care hospital of West Bengal, India. The study was conducted for one year by interviewing 384 participants. Information pertaining to demographic and correlates of RTA were collected. It was two phased study and during 2nd phase 16 participants didn't respond making total of 368. Descriptive and inferential analyses was done using SPSS version 22.0. Results indicated that 13.2% of participants faced death while 21% had disability. Logistic regression was used for continuous variables which showed high association (<0.05) of death and disability with non-usage of protective devices, poor road condition, sustaining multiple injuries and lapsing 'golden hour' for treatment.

2.3 Impacts of Road Traffic Accidents

Road traffic accidents can have an impact on both physical well-being and economic well-being. It can result in serious physical injuries, such as broken bones, head injuries, and spinal cord injuries, as well as fatalities. In severe cases, these injuries can result in permanent disabilities or loss of life (ec.europa.eu, 2018). Eskindir D. et al conducted a cross sectional study in Central Ethiopia to determine the road traffic accident and management outcome. The results showed soft tissue injuries were most common (51%) and then came dislocation and fracture (26%).

Moreover, road traffic accidents can also have psychological impacts, such as trauma, depression, and anxiety. This can be especially severe for those who are directly involved in the accident or for family members who have lost a loved one in a crash. Research shows that one in every five accident victims is diagnosed with a physiological disorder (Dai et al., 2018). Furthermore, road traffic accidents can result in significant economic costs, including medical expenses, rehabilitation costs, property damage, and lost productivity. In many cases, these costs can be substantial and can place a burden on families, communities, and society as a whole. Many studies reported economic issues as a result of road traffic accidents. For instance, according to a study conducted by Mayou and Bryant (2003), it was reported that 40% of traffic crash victims experience financial problems for almost 90 days. Adding to this, road traffic accidents can disrupt daily life for those involved, their families, and their communities. This can include disruptions to work and school, as well as changes to personal relationships and daily routines. A study conducted by the Fédération Européenne des Victimes de la Route in Europe showed that 85% of the families of road traffic accident victims experienced a decline in their quality of life. Similarly in another study, it was concluded that more than half of the road traffic-injured patients faced a decline in their quality of life (Hours et al., 2013).

2.4 Knowledge, Attitude and Practices on road traffic accidents

Mohammed Abdulrahman Alhassan et al conducted a cross sectional study in Majmaah City to determine the knowledge, attitude and practices of Saudi drivers'. Social media particularly Twitter was used for this purpose. There were 157 participants who took part in the study. 69.4% had a car and 90.5% had driving license. Regarding the knowledge about traffic rules and signs 56.1% had a good understanding while 38.9% and 5.1% had moderate and poor knowledge respectively. While 87.9% drivers had poor behavior towards driving, 12.1% had medium and no one had a good behavior. A person's behavior had significant association ($p=0.05$) with person's education level, age, marital and financial status.

Sarfraz khan et al. conducted a study in three cities of Pakistan (Gilgit, Skardu and Chilas) to investigate the consequences of road safety practices. Data were retrieved from 475 patients and statistical and inferential analysis was done using SPSS version 21. Majority of the drivers had negative behavior towards traffic rules and regulations and had no proper knowledge. In GB, the analysis showed a positive correlation between road safety practices and road traffic accidents.

Phillips L. Challah et al conducted a research in North western Tanzania to investigate the outcome of injury among the cyclists with helmet and with no helmet. 654 patients who were involved in motorcycle accidents participated in study. The study found that in Tanzania, helmet use is less (47.7%) and 32.4% of patients had alcohol consumption before the accident occurred. It showed a significant association of helmet use with fewer deaths and less time in hospitals.

2.5 Essential surgical capacity and readiness of Health facilities

Surgically curable conditions are among the top 15 causes of disability and surveys show that surgical issues contribute 11% of the world's disability-adjusted life years (DALYs).

In 2004, South East Asia and Africa accounted for 54% of the global burden. On the other hand more than two billion people globally are without access to surgical care. As a result, minor surgical pathologies become lethal and treatable trauma progresses to death. A study conducted in Somalia, provides an overview of the capacity for surgical care representing health facilities in all three zones of the country, including 10 of the 18 regions and demonstrates the significant gaps in infra- structure, life-saving and disability-preventing surgical interventions and essential equipment. In spite of the dire need, primary healthcare professionals are not satisfactorily including this important issue in global financing and policy debates, largely due to the perceived complexity and cost of surgery and trauma. Although, every $1 spent on strengthening local surgical capacity generates $10 through improved health and increased productivity (Elkheir N. et al 2014). In 2008, the Copenhagen Consensus Center's research identified strengthening surgical capacity, particularly at the district hospital level, as a highly cost-efficient solution to global diseases. Notably, strengthening local surgical capacity is an approach that would provide a high degree of financial protection to populations and address the DALYs in a cost-effective manner.

2.6 Conceptual framework

Traffic safety culture is an important part of the entire traffic system. The system approach is getting acceptance throughout the world at present. It discourages the traditional approach that basically attributed the responsibility for road traffic crashes to humans. In contrast, the system approach proposes the concept that every stakeholder in society should take responsibility for the traffic safety system

Therefore, a conceptual framework for road traffic safety can be designed. As shown in the following figure, common vision of road safety at the top of the triangle also represents the ultimate goal of eliminating death due to road traffic crashes. Complex

nature of the road safety culture constitutes the basis and background of the framework (Morimoto A. et, al.2021).

Figure 4: Conceptual framework of road traffic safety

2.7 Operational definitions

2.7.1 Road traffic accident (RTA): A collision involving at least one vehicle in motion on a road that results in at least one person being injured or killed.

2.7.2 Road traffic injuries (RTIs) Fatal or non-fatal injuries incurred as a result of road traffic accident.

2.7.3 Management capacity*:* Capacity of healthcare facilities for efficient, error-free patient evaluation, treatment, and transfer.

2.7.4 Gilgit-Baltistan Formerly known as the Northern Areas, is a region administered by Pakistan as an autonomous territory, constituting the northern portion of Kashmir. Currently it has been given the status of provisional province of Pakistan.

Chapter III: Methodology

3.1 Study design

A descriptive cross-sectional study was carried out to determine the pattern of road traffic accidents and management capacity in the tertiary care hospitals of Gilgit-Baltistan.

3.2 Study Duration

The study duration for the current research was six months.

3.3 Study setting

The study was carried out in the four tertiary care hospitals of Gilgit-Baltistan. Gilgit city is the capital of GB whereas, Skardu and Chilas are the main cities of Baltistan and Diamer divisions respectively. Provincial headquarter (PHQ) Gilgit and City hospital Gilgit mainly cover Gilgit region. Regional headquarter hospital (RHQ) Skardu is the only tertiary level health facility in Baltistan. Similarly, RHQ Hospital Chilas serves Diamer region.

3.3 Sampling Unit

The study subjects were road traffic injury patients.

3.4 Sampling Technique

Data was collected using non-probability consecutive sampling techniques.

3.5 Sample Selection

3.5.1 Inclusion criteria

1. Patients reported to the emergency or trauma unit with history of road traffic injury.
2. Reported within 24 hours of accident or referred from peripheral hospitals.
3. Give consent to respond the survey.

3.5.2 Exclusion criteria

1. Patients admitted with delayed complications of RTI.
2. Slip and fall injuries.
3. Brought dead after accident.
4. Patients unwilling to participate in the study.

3.6 Sample Size Calculation

The sample size was calculated by using Open-Epi Menu software at 61% prevalence (Minhas et.al, 2017), 95% confidence interval and 5% margin of error. After calculation it was 386.

3.7 Data Collection Tools

Data collection was completed with the help of two structured questionnaires:

1. Collection of data from RTI patients and
2. Collection of data for assessing capacity and readiness of tertiary care hospitals.

To obtain data from RTI patients, an adapted questionnaire was administered to the RTI patients or their attendants (Singh et al. 2013). This questionnaire included sociodemographic variables and questions related to history, risk factors, type and severity of injury.

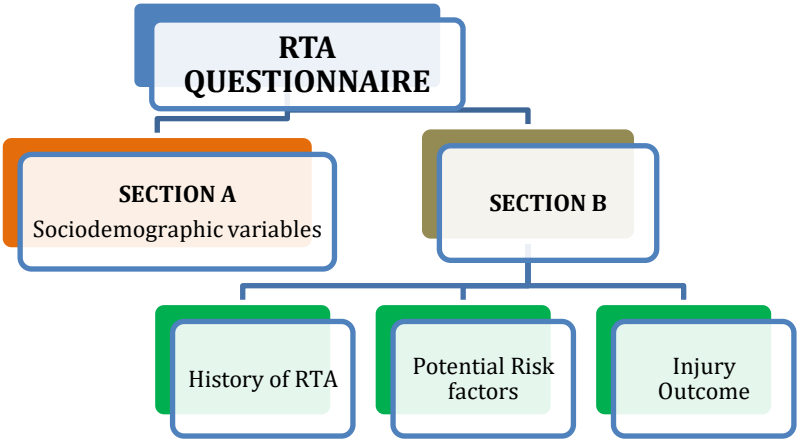

Figure 5: Components of RTA Questionnaire

Assessment of health facilities was executed by using World Health Organization Tool for Situational Analysis to Assess Emergency and Essential Surgical Care (EESC). This tool

comprises 136 data points and investigates four key areas: infrastructure, human resources, interventions, and equipment/supplies. This analysis was completed by interviewing the heads of facilities, a section in charge, nursing officers and hospital records after asking for permission from the concerned authorities.

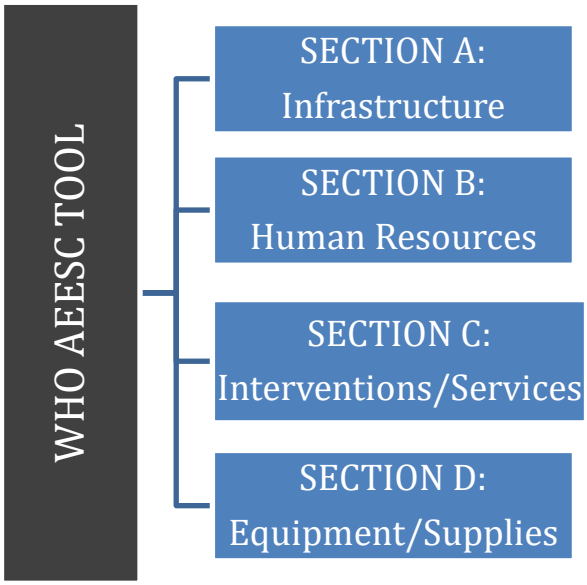

Figure 6: Components of WHO situational analysis tool to assess AEESC

3.8 Sampling Strategy

Data was collected from four leading tertiary care hospitals of Gilgit-Baltistan using non-probability consecutive sampling.

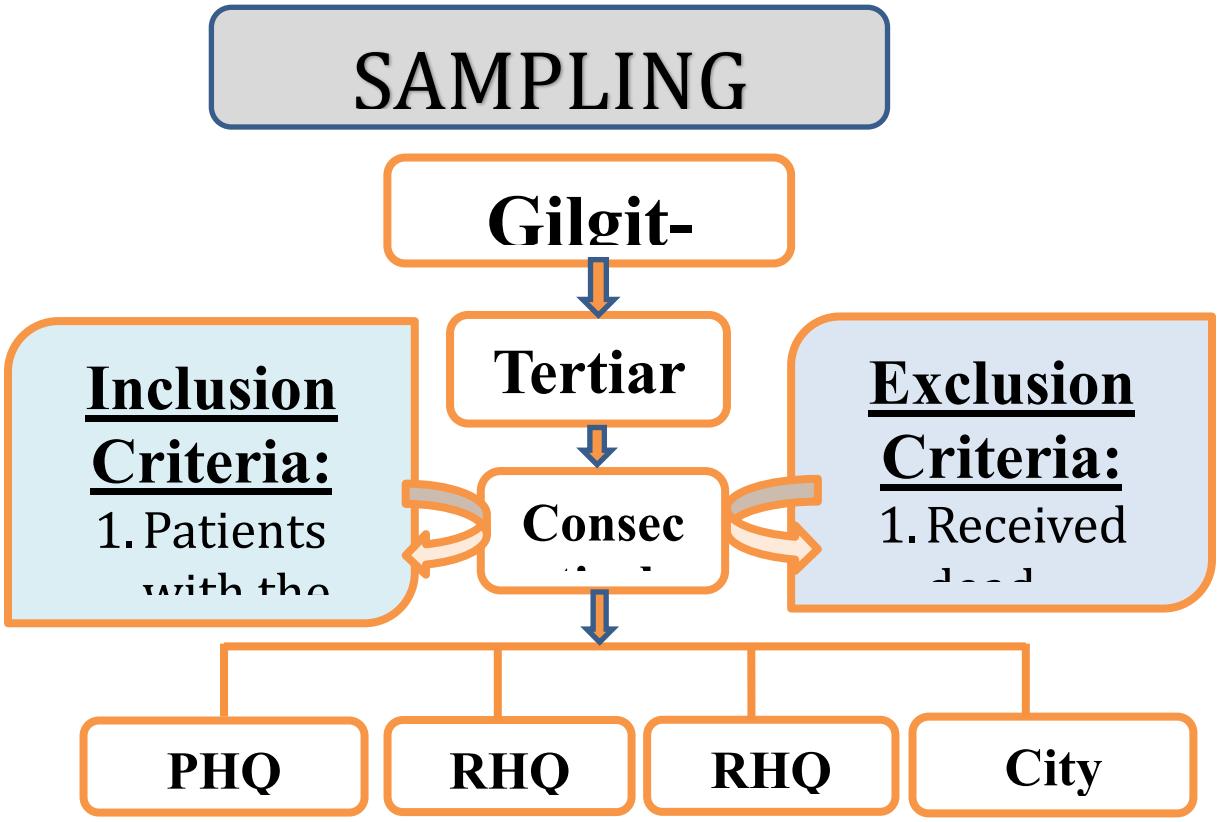

Figure 7 : Sampling Strategy

3.9 Study Variables

3.9.1. Outcome Variables

The major construct of the questionnaire was to assess pattern of road traffic injuries. The outcome variable was pattern of road traffic injuries and nature of injuries. Injury severity score tells the severity of injury as well as the pattern of involvement by body region. ISS divides the body into 6 regions assigning specific number to each body region. Similarly the severity of injury ranges from 1 to 6. A score of 1 shows minor injury which may not need consultation or treatment whereas a score of 6 means fatal injury. Final ISS score is obtained by squaring all the values of involved body regions and adding the highest 3 values. If score

of 6 is given to a body region which shows a fatal injury, no further scoring is needed in other body regions. ISS Score ranges from 1 to 75, however more than 25 is labelled as fatal.

Table 1: Injury severity score

Body region	AIS Code	AIS Score (1 to 6)	Square Top 3 AIS score
Head and neck	1		
Face	2		
Chest/Thorax	3		
Abdomen/Pelvis	4		
Extremities	5		
External	6		
ISS score is calculated adding the square top 3 values.			ISS Score=

3.9.2. Independent Variables

The Performa included socio-demographic variables such as gender, age, education level, marital status, place of residence etc. In addition to these, variables related to history of RTIs and potential risk factors of RTA were also included

3.10 Pilot testing

Pilot testing was performed before starting the formal data collection procedure by including 10% of the actual sample size. Performa was tested for any future changes; no major changes were done after pilot testing. Data from pilot testing was not included in final analysis. . Initially it was consisted of 36 items. However, one question was removed and some options were merged after the pilot study. Reliability statistics in terms of Cronbach alpha for 10 items of

similar construct was found to be 0.75. This study was done after interviewing almost 8 patients each from four tertiary care hospitals i.e. a total of 30 patients.

3.11 Data Analysis

Data were analyzed using the statistical package for social science (SPSS) version 26. Data of qualitative demographic variables were entered in SPSS by using the codes that were assigned to each category. While data of quantitative variables were entered in numerical form.

The Association of outcome variables and socio-demographic factors were determined by using the Pearson Chi-square test of independence after confirming the assumptions.

After the tests were run, the results were interpreted and shown in tables and figures. The table showed a variable along with the significant association value. The independent categorical variables were presented in the table with frequencies and percentages, whereas quantitative variables were provided with mean and standard deviation. A p-value ≤ 0.05 was considered to be significant.

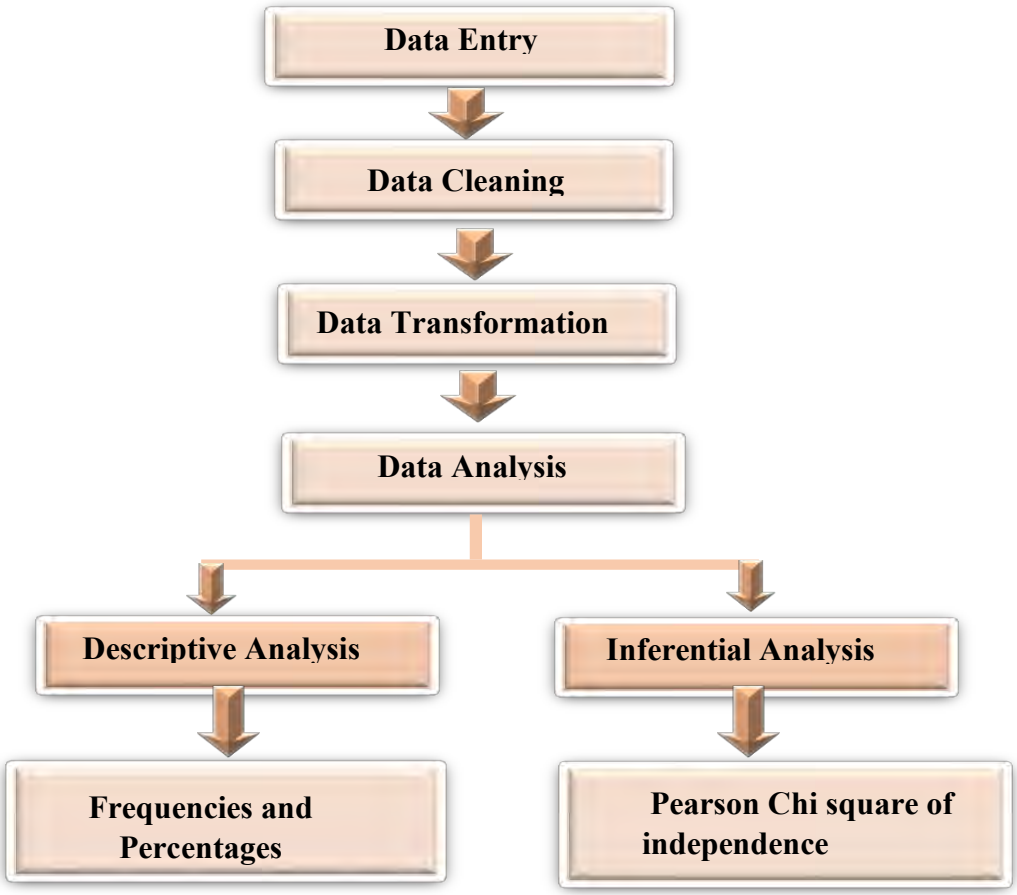

Figure 8: Data analysis plan

To examine the readiness and management capacity of tertiary care hospitals of Gilgit-Baltistan, data from WHO Tool for Situational Analysis to Assess EESC was utilized. Results were shown in the form of table and figures.

3.11 Ethical Considerations

Before starting formal data collection, approval from Institutional Review Board (IRB) of Al-Shifa School of Public Health Rawalpindi, Pakistan has been taken (Annexure-). Permission letter from the Head of Department of Al-Shifa School of Public Health was obtained. With the help of this letter access to health facilities and patients was justified. Individuals were explained the purpose of the research and oral consent was taken from each participant (Annexure-3). Participants were assured for the confidentiality of their data. Data collected from the respondents was kept anonymous and was not shared with anyone. Data was entered in SPSS anonymously.

Chapter IV: Results

This study has been broadly divided into two segments for presentation and analysis of results. In the first segment, data obtained from the RTI Questionnaire have been presented which describes the sociodemographic characteristics of the study sample, history of RTI, risk factors and outcome of accident/injury. Whereas, the second part is related to management capacity of four leading public sector hospitals of GB. This assessment was accomplished with the help of WHO situational analysis tool for EESC.

4.1 Pattern of Road Traffic Injuries

4.1.1. Descriptive Results

4.1.1.1. Demographic characteristics

A total of 386 cases of road traffic injures from four tertiary care hospitals of Gilgit-Baltistan were included during the study period. Among them 358 (92.7%) were local i.e. permanent residents of Gilgit-Baltistan and 20 (5.2%) victims were non-local. Likewise, 8 (2.1%) foreigners also reported with the history of RTA.

Table 2: Demographic characteristics

Sociodemographic variables	**Categories**	**Frequency**	**Percent**
Place of residence	Local (GB)	358	92.7
	Non local	20	5.2
	Foreigner	8	2.1
Gender	Male	310	80.3
	Female	76	19.7
Age group in years	Less than 15	26	6.7
	16-30	148	38.3
	31-45	120	31.1
	46-60	76	19.7
	More than 60	16	4.1
Education level	No schooling	70	18.1
	Primary	102	26.4
	Matric	78	20.2
	Intermediate	94	24.4
	Graduation and above	42	10.9
Marital status	Single	166	43.0
	Married	210	54.4
	Divorced/widow	10	2.6

Occupation of patient	Student	114	29.5
	Laborer	96	24.9
	Employee	66	17.1
	Business	34	8.8
	Unemployed	56	14.5
	Others	20	5.2
Monthly income	Less than 50000	290	75.1
	Around 1 lac	76	19.7
	1-3 lacs	12	3.1
	Above 3 lacs	8	2.1
Any pre-existing illness?	CHD	10	2.6
	Hypertension	44	11.4
	Diabetes	34	8.8
	Others	34	8.8
	None	264	68.4

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In the present study, considering all age groups, males 310 (80.3%) were more commonly involved than females 76 (19.7%) with the ratio of 4.08:1. The highest number 148 (38.3%) of victims were between 16 and 30 years of age followed by 120 (31.1%) from the age group of 31-45 years. Similarly, age of 76 (19.7%) study participants ranged between 46 to 60 years. There were 26 (6.7%) children below 15 years of age and 16 (4.1%) victims were aged 60 and above.

4.1.1.2. History of RTA

Leading causes and risk factors of RTA include type of vehicle, over speeding, time of the day, condition of road and mechanical faults etc. All these factors were investigated in this study and results are tabulated as under:

Table 3: Descriptive results of RTA History

History questions	**Response**	Frequency	Percent
Where were you?	Motorcyclist	182	47.2
	HMV (bus, truck, oil tanker etc.)	58	15.0
	LMV (car, pajero, jeep, tractor etc.)	128	33.2
	Pedestrian	10	2.6
	Others	8	2.1
Struck with?	Motorbike	90	23.3
	LMV	46	11.9
	HMV	32	8.3
	Overturned	40	10.4

	Rolling/sliding stone	14	3.6
	Fell down the road	66	17.1
	Others	98	25.4
Did you lose consciousness?	Yes	140	36.3
	No	198	51.3
	Don't know	48	12.4
Speed of vehicle in km/hour?	Low	6	1.6
	Medium	24	6.2
	High	246	63.7
	Very high	94	24.4
	Not applicable	16	4.1
Any pre-hospital care given?	Yes	190	49.2
	No	124	32.1
	Not known	72	18.7
Where was the first aid given?	At accident site	28	7.3
	Rescue1122	90	23.3
	nearby health facility	140	36.3
	Others	14	3.6
	Not applicable	114	29.5
Mode of transport to this hospital?	Govt. Ambulance	48	12.4
	Rescue1122	134	34.7
	Private vehicle	146	37.8
	Others	58	15.0
Location of accident	National highway	88	22.8
	District roads	150	38.9
	Tourist spot	28	7.3
	Rural road	120	31.1
Time of accident?	Morning (8am to 2pm)	132	34.2
	Evening (2pm to 8pm)	176	45.6
	Night (8pm to 8am)	78	20.2

4.1.1.3. Risk factors

Use of helmet, use of seat belt and adequate lighting are important precautionary measures that should be ensured while driving. Similarly fatigue, use of drugs and overloading are also undesirable. Results for these factors are shown below:

Table 4: Descriptive result of Risk factors

Question/Risk factor	**Categories**	Frequency	Percent
Using seat belt?	Yes	28	7.3
	No	142	36.8
	Don't know	8	2.1
	Not applicable	208	53.9
Using helmet?	Yes	50	13.0
	No	174	45.1
	Don't know	8	2.1
	Not applicable	154	39.9
Use of mobile phone while driving?	Yes	86	22.3
	No	226	58.5
	Don't know	30	7.8
	Not applicable	44	11.4
Having license?	Yes	180	46.6
	No	114	29.5
	Not applicable	92	23.8
	Total	386	100.0
Lighting	Adequate	254	65.8
	Inadequate	66	17.1
	Don't know	66	17.1
Rainfall/snowfall at the time of accident?	Yes	68	17.6
	No	308	79.8
	Don't know	10	2.6
Condition of road?	Plain	148	38.3
	Pot-holed	32	8.3
	Under construction	66	17.1
	Muddy	44	11.4
	Steep slope	42	10.9
	Curve/turn	54	14.0
Any mechanical fault?	Yes	40	10.4
	No	230	59.6
	Don't know	78	20.2
	not applicable	38	9.8
Stress/fatigue?	Yes	60	15.5
	No	140	36.3

	Don't know	52	13.5
	Not applicable	134	34.7
No of passengers in the vehicle?	Below capacity	92	23.8
	Up to capacity	180	46.6
	Overloaded	108	28.0
	Not applicable	6	1.6
Speed of other vehicle	Low	26	6.7
	High	232	60.1
	Stopped	34	8.8
	Not applicable	94	24.4
Do you know about traffic rules?	Little much	148	38.3
	Yes	182	47.2
	No	56	14.5
Do you follow traffic rules?	Always	66	17.1
	Most of time	192	49.7
	No	78	20.2
	Not applicable	50	13.0
Taken any sedative/addictive substance?	Yes	24	6.2
	No	84	21.8
	Don't know	192	49.7
	Not applicable	86	22.3

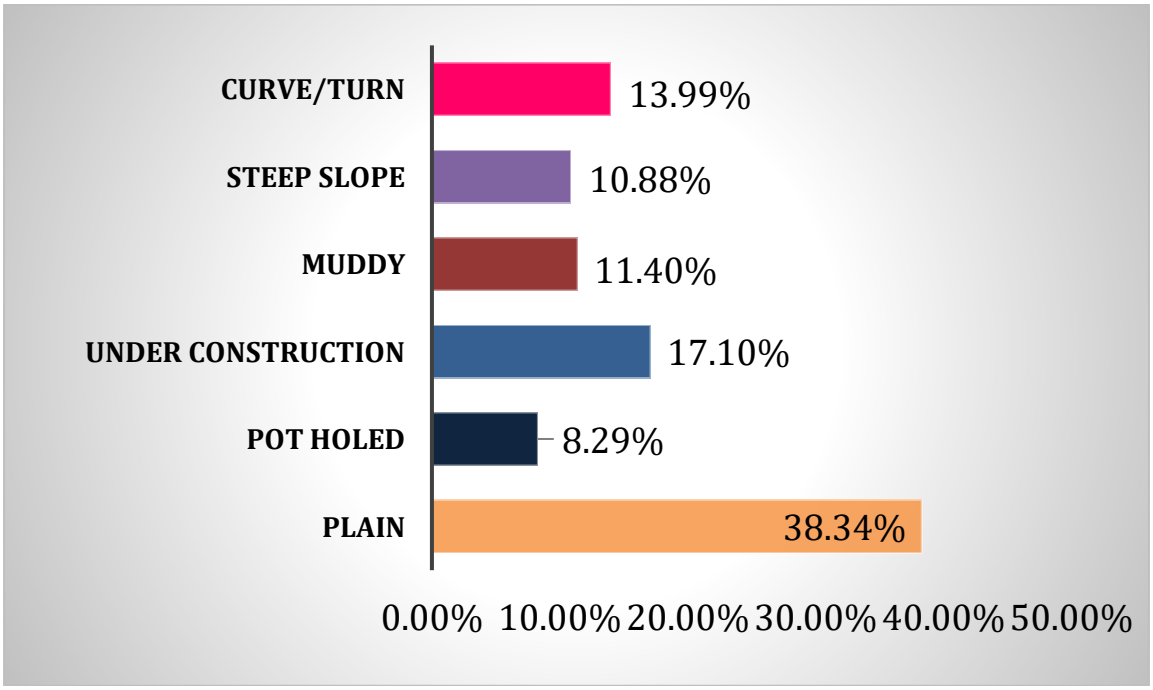

Figure 8: Condition of Road

4.1.1.4 Outcome of RTA

Injury severity core, nature of injury and percentage of affected anatomical regions were the outcome of this study. Injury severity score was the main outcome variable which was tested independently for association with input variables. Descriptive analysis is given below:

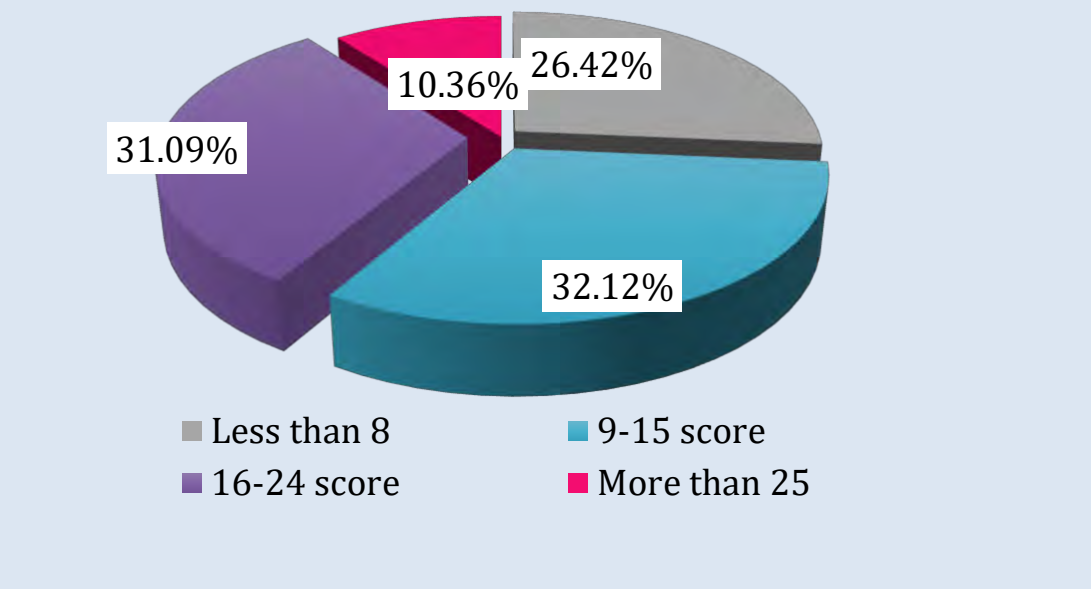

Figure 9: Injury severity score

In this study it was found that 26% injuries were minor, 32% moderate, 31% severe and 10.36% fatal injuries. Among the body regions, head and neck was the most affected parts.

Table 5: Descriptive results for outcome of RTA

Outcome	Category	Frequency	Percent
Injury severity score.	Less than 8	102	26.4
	9-15	124	32.1
	16-24	120	31.1
	More than 25	40	10.4
Involvement of head and neck	Yes	218	56.5
	No	168	43.5
Involvement of face?	Yes	130	33.7
	No	256	66.3
Involvement of chest/thorax?	Yes	64	16.6
	No	322	83.4
	Yes	50	13.0

Involvement of abdomen/pelvis?	No	336	87.0
Involvement of extremities?	Yes	232	60.1
	No	154	39.9
External injuries?	Yes	128	33.2
	No	258	66.8
Nature of injury?	Blunt	56	14.5
	Penetrating	24	6.2
	Cut/open	80	20.7
	Multiple	104	26.9
	Fracture	70	18.1
	Sprain	24	6.2
	Hematoma	10	2.6
	Abrasion	18	4.7
Nature of injury is due to?	Primary impact	352	91.2
	Secondary impact	34	8.8

Multiple injuries were the most reported type of injuries (26.94%) in this study followed by cuts/open injuries (20.73%), fractures (18.13%), blunt injuries (6.22%) and abrasions (4.7%).

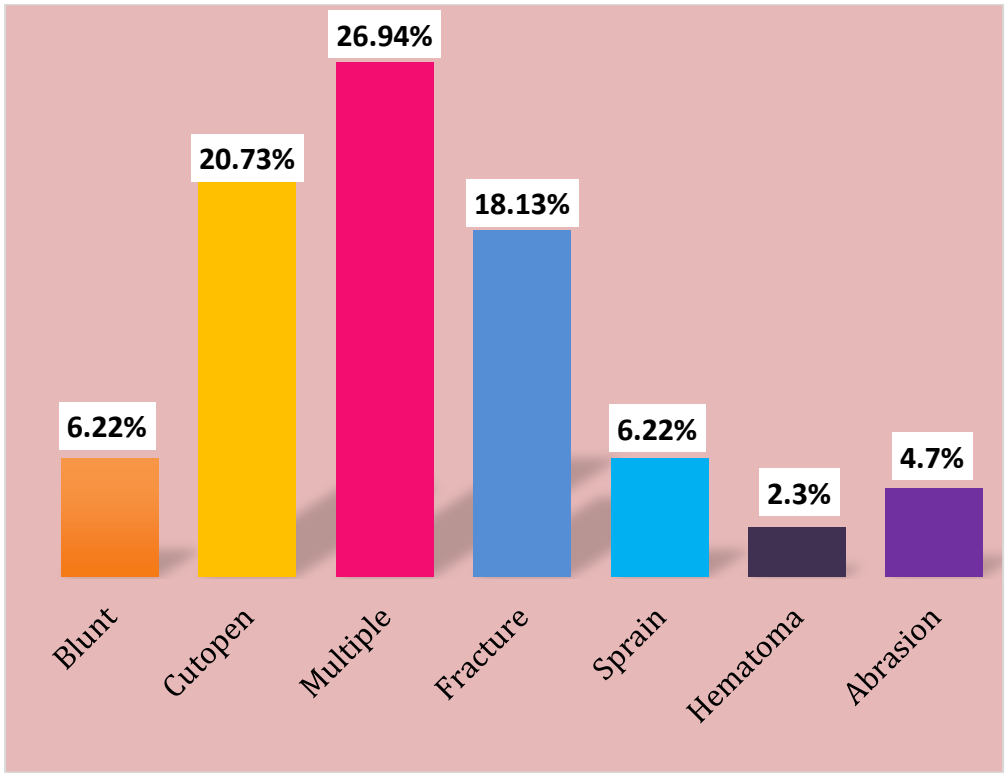

Figure 10: Nature of Injury

4.1.2. Inferential Analysis (Chi-square)

Chi-square of independence was applied to examine the association between injury severity score and input variables. Results for each variable are shown in the following table:

Table 6: Association with Injury Severity Score

Socio-demographic factors	Injury Severity Score (ISS)			
	Less than 8	9-15	16-24	More than 25
Gender				
Male	72 (23.3%)	100 (32.3%)	100 (32.3%)	38 (12.3%)
Female	30 (39.5%)	24 (31.6%)	20 (26.3%)	2 (2.6%)
p-value	12.258(3)		.007	
Age				
Less than 15	12(46.2%)	8(30.8%)	24(34.3%)	6(11.4%)
16-30	40(27.0%)	40(27.0%)	46(45.1%)	12(11.8%)
31-45	30(25.0%)	46(38.3%)	20(25.6%)	6(7.7%)
46-60	16(21.1%)	26(34.2%)	24(25.5%)	14(14.9%)
More than 60	4(25.0%)	4(25.0%)	6(14.3%)	0(0%)
p-value	0.743			
Education				
No schooling	20(28.6%)	18(25.7%)	47 (22.5)	113 (64.2)
Primary	10(9.8%)	34(33.3%)	84 (40.2)	27 (15.3)
Metric	26(33.3%)	26(33.3%)	67 (32.1)	19 (10.8)
Intermediate	24(25.5%)	32(34.0%)	11 (5.3)	17 (9.7)
Graduation and above	22(52.4%)	14(33.3%)	26(33.3%)	O(.0%)

p-value	0.0001			
Marital Status				
Single	36(21.7%)	62(37.3%)	55(32.5%)	14(8.4%)
Married	64(30.5%)	56(26.7%)	66(31.4%)	24(11.4%)
Divorced/widow	2(20.0%)	6(60.0%)	0(0%)	2(20.0%)
p-value	13.598(6)		0.34	
Average Monthly income				
Less than 50000	84(29.0%	100(34.5%	82(28.3%)	24(8.3%)
Around 1 lac	12(15.7%	20(26.2%	36(47.4%)	8(10.5%)
1-3 lacs	4(33.3%	4(33.3%	0(.0%)	4(33.0%)
Above 3 lacs	2(25%	0(.0%	2(25.0%)	4(50.0%)
p-value	26.755(15)		.031	
Preexisting illness				
CHD	2(20.0%)	4 (40.0%)	4(40.0%)	0 (.0%)
Hypertension	12(27.3%)	12(27.3%)	20 (45.5%)	0 (.0%)
Diabetes	10 (29.4%)	6(17.6%)	10(29.4%)	8(23.5%)
Others	12 (35.3%)	8(23.5%)	14(41.2%)	0 (.0%)
None	66 (25.0%)	94(35.6%)	72(27.3%)	32(12.1%)
p-value	27.161(12)		0.73	
Where were you at the time of injury?				
Motorcyclist	52 (28.6%)	42(23.1%)	62(31.1)	26 (36.4)
HMV (bus, truck, oil tanker etc.)	18(31.0%)	22(37.9%)	10(68.9)	8(63.6)

LMV (car, Pajero, jeep, tractor etc.)	26(20.3%)	52(40.6%)	46(35.9%)	4(3.1%)
Pedestrian	4(40.0%)	6(60.0%)	0(.0%)	0(.0%)
Others	2(25.0%)	2(25.0%)	2(25.0%)	2(25.0%)
p-value	34.759(12)		.001	
	Struck With			
Motorbike	34 (37.8%)	28(31.1%)	18(20.0%)	10(11.1%)
LMV	12(26.1%)	12 (26.1%)	16(34.8%)	6(13.0%)
HMV	8(25.0%)	10(31.3%)	12(37.5%)	2(6.3%)
Overturned	12(30.0%)	10(25.0%	14(35.0%)	4(10.0%)
Rolling/sliding stone	2(14.3%)	6(42.9%)	6(42.9%)	0(.0%)
(Fell down the road	8(12.1%)	30(45.5%)	16(24.2%)	12(18.2%)
(Others	26(26.5%)	28(28.6%)	38(38.8%)	6(6.1%)
p-value	32.032(18)		.022	
	Speed of Vehicle			
Low	2 (33.3%)	0(.0%)	4 (66.7%)	0(.0%)
Medium	2 (8.3%)	6(25.0%)	10 (41.7%)	8(25.0%)
High	74 (30.1%)	70(28.5%)	74 (30.1%)	28(11.4%)
Very High	24 (25.5%)	40(42.6%)	26 (27.7%)	4(4.3%)
Not applicable	0(.0%	8(50.0%	6(37.5%)	2(12.5%)
p-value	0.37		0.0001	
	ACCIDENT Location			
National highway	18 (20.5%)	24 (27.3%)	32(36.4%)	14(15.9%)

District roads	52 (34.7%)	50 (33.3%)	40(26.7%)	8 (5.3%)
Tourist spot	4(14.3%)	10(35.7%)	14(50.0%)	0(.0%)
Rural road	28(23.3%)	40(33.3%)	34(28.3%)	18(15.0%)
p-value	24.829(9)		.003	
	Time of Accident			
Morning (8am to 2pm)	46(34.8%)	48 (34.8%)	24(18.2%)	16(12.1%)
Evening (2pm to 8pm)	38(21.6%)	64(36.4%)	56 (31.8%)	18 (10.2%)
Night (8pm to 8am)	18(23.1%)	14(17.9%)	40(51.3%)	6(7.7%)
p-value	29.869(6)		.13	
	Using Seat Belt			
Yes	4(14.3%)	10(35.7%)	10(35.7%)	4 (14.3%)
No	28(19.7%)	56(39.4%)	46 (32.4%)	12(8.5%)
Don't know	0(.0%)	2(25.0%)	4(50.0%)	2 (25.0%)
Not applicable	70(33.7%)	56(26.9%)	60(28.8%)	22(10.6%)
p-value	0.37		0.001	
	Rainfall/Snow			
Yes	14(20.6%)	16(23.5%)	32(47.1%)	6(8.8%)
No	88 (28.6%)	104(33.8%)	82(26.6%)	34(11.0%)
Don’t know	0(.0%)	4(40.0%)	6(60.0%)	0(.0%)
p-value	0.588		0.276	
	Road condition			
Plain	50(33.8%)	42(28.4%)	38(25.7%)	18(12.2%)
Pot-holed	12(37.5%)	12(37.5%)	8(25.0%)	0(.0%)

Under construction	16(24.2%)	26(39.4%)	18(27.3%)	6(9.1%)
Muddy	16(36.4%)	10(22.7%)	18(40.9%)	0(.0%)
Steep slope	4(9.5%)	20(47.6%)	16(38.1%)	2(4.8%)
Curve/turn	4(7.4%)	14(25.9%)	22(40.7%)	14(25.9%)
p-value	.63			

In this study, gender was found to be significantly associated with injury severity (p= .007). A strong association was observed between the education level of the victims and injury severity score (p=0.001). The present study revealed a significant correlation of the type of vehicle and ISS (p=0.001). Out of 386 respondents, 124 (32.1%) have injury severity score of 9-15, of which motorcyclists have suffered the most. On the other hand, pedestrians were among the least injured group (4.8%).It was noted that Rescue 1122 and nearby health facilities mainly administer first aid to RTA patients. Rescue1122 is also contributing in shifting of patients (43%) from accident site to hospitals.

Fatal injuries were greater in number on rural roads (18%) than they were on the Karakoram Highway (14%) during the study period. Moreover, this study found direct relation between speed of vehicle and injury severity score (p=0.001).

In this study, using seatbelt is strongly associated with injury severity score with p=0.003. Out of all 39.4% has injury severity score of 9-15 who were not wearing seatbelts.

4.2. Assessment of tertiary care Hospitals of GB

4.2.1. Profile of Tertiary Care Hospitals

There are four tertiary care hospitals in Gilgit-Baltistan, each in a region and the PHQ Hospital in Gilgit city. These hospitals share almost the total burden of patients across GB. Recently, College of Physicians and Surgeons of Pakistan (CPSP) has elevated these hospitals for post graduation training as there is no Teaching Hospitals in the region. Brief profile of the hospitals is given in the following table.

Table 7: Profile of public sector tertiary care hospitals of Gilgit-Baltistan

S. No	Name of facility	Division	Catchment population (2017)	No of beds	No of operation theatres
1	Provincial Headquarters Hospital Gilgit	Gilgit	581050	300-400	5-10
2	Regional Headquarters Hospital Skardu	Baltistan	546686	200-300	5-10
3	Regional Headquarters Hospital Chilas	Diamer	365188	200-300	5-10
4	City Hospital Gilgit	Gilgit	581050	81-100	2-4

4.2.2. Infrastructure

Availability of essential surgical equipment, diagnostics and materials along with other related logistics are tabulated as under.

Table 8: Availability of infrastructure and health resources (N=4)

	Always	Sometimes	Not available
Oxygen cylinder	4	0	0
Running water	3	1	0
Electricity source	2	2	0
Operational power generator	2	1	1
Blood bank	3	0	1
Hemoglobin and urine testing	4	0	0
X-ray machine	4	0	0
Medical records	4	0	0

Area designated for emergency care	4	0	0
Area designated for postoperative care	3	0	1
Management guidelines for emergency care	3	1	0
Management guidelines for surgery	3	1	0
Management guidelines for anaesthesia	4	0	0
Management guidelines for pain relief	3	0	1
Functioning anaesthesia machine	4	0	0

4.2.3. Human resources

The 4 facilities reported a total of 17 full time qualified surgical specialists working in all regions. There were 12 qualified Gynecologists/obstetricians with one working as a part time worker in one of the hospitals and 15 were identified as qualified anesthesiologists posted in all facilities.

Table 9: Status of Human Resource

Category/Cadre	PHQ Gilgit	RHQ Skardu	RHQ Chilas	City Hospital Gilgit
Surgeons (Qualified)	6	4	4	3
Anesthetists (Qualified)	5	5	3	2
Gynecologists (Qualified)	5	4	1.1*	2
General Doctors	45-50	30-35	25-30	15-20
Surgery Assistants	13	9	11	4
Anesthesia Assistants	7	6	6	3
Paramedics	147	81	101	73

* No after decimal shows Part time/temporary employee.

4.2.4. Interventions

Following table shows the availability of essential services and interventions in the four tertiary care hospitals 0f GB.

Table 10: Interventions and services

Procedure/Service	Available (N=4)
Resuscitation (airway, hemorrhage, peripheral percutaneous intravenous access, peripheral venous cut down)	4
Cricothyroidotomy/tracheostomy	4
Chest tube insertion	4
Removal of foreign body (throat/ear/eye/nose)	4
Acute burn management	4
Incision and drainage of abscess	4
Suturing (for wounds, episiotomy, lacerations)	4
Wound debridement	4
Caesarean section	3
Dilation and curettage (gynecology/obstetrics)	3
Obstetric fistula repair	3
Appendicectomy	4
Hernia repair (strangulated, elective)	3
Hydrocoele	4
Cystostomy	4
Urethral stricture dilation	2
Laparotomy (uterine rupture, ectopic pregnancy, acute abdomen, intestinal obstruction, perforation, injuries)	4
Congenital hernia repair	3

Neonatal surgery (abdominal wall defect, colostomy imperforate anus, intussusceptions)	2
Contracture release/ skin grafting	2
Fracture treatment	3
Joint dislocation treatment	4
Drainage of osteomyelitis/septic arthritis	4
Amputation	2
Biopsy (lymph node, mass, other)	4
Cataract surgery	2

4.2.5. Emergency equipment and supplies for resuscitation

There is considerable variation in the availability of supplies among different hospitals as well as within the same health facility during different seasons. An overview of emergency Equipments and supplies is presented in the following table.

Table 11: Emergency Equipments and Supplies (N=4)

ITEMS/EQUIPPMENTS	ALWAYS	SOMETIMES	NEVER
Resuscitator bag valve and mask (Adult)	2	2	0
Pediatric	2	2	0
Oxygen	4	0	0
Stethoscope	4	0	0
Batteries for flashlight	4	0	0
Suction pump	3	1	0
Blood pressure monitoring equipment	4	0	0
Thermometer	4	0	0
Scalpel handle with blade	4	0	0

Retractor	4	0	0
Scissors straight 12cm	4	0	0
Scissorsblunt14cm	4	0	0
Oropharyngeal airway (Adult)	2	1	1
Oropharyngeal airway (Child)	2	1	1
Forceps Kocherno teeth	4	0	0
Forceps, artery	4	0	0
Kidney dishes stainless steel	3	1	0
Capped bottle ,alcohol-based solutions	2	2	0
Gloves(sterile)	4	0	0
Gloves(examination)	3	1	0
Needle holder	4	0	0
Sterilizer	4	0	0
Nailbrush, scrubbing surgeon's	4	0	0
Drum for sterile compresses, bandages, dressings	3	1	0
Examination table	4	0	0

Chapter 5: Discussion

This cross sectional study assessed the pattern of road traffic injuries and management capacity of four leading tertiary care hospitals of Gilgit-Baltistan. Data were collected through an adapted survey questionnaire from RTI cases. Two outcome variables (injury severity score and nature of injury) were tested independently for their association with socio demographic and other variables. Whereas, the WHO situational analysis tool for emergency and essential surgical care (EESC) was applied to examine the management capacity of health facilities in terms of infrastructure, human resource, interventions (services) and supplies/equipment.

5.1 Pattern and severity of Injury

In this study, gender was found to be significantly associated with injury severity (p= .007). This may be attributed to the fact that males frequently travel as bread earner in the society. A strong association was observed between the education level of the victims and injury severity score (p=0.001) which is directly related to road traffic injuries. Similar results were reported by previous researches (Mitra et al. 2018). It has been estimated that uneducated people account for the highest mortality rate due to road traffic accidents. This could be due to less awareness about traffic rules and regulations (Gregesen and Breg 2017).

The present study revealed a significant correlation of the type of vehicle and ISS (p=0.001). Out of 386 respondents, 124 (32.1%) have injury severity score of 9-15, of which motorcyclists have suffered the most. On the other hand, pedestrians were among the least injured group (6*4.8%). This finding is consistent with previous identical researches (Kumar et al. 2014). Possible reason could be less stability of two wheelers. It was noted that Rescue 1122 and nearby health facilities mainly administer first aid to RTA patients. Rescue1122 is also contributing in shifting of patients (43%)from accident site to hospitals.

Interestingly, fatal injuries were greater in number on rural roads (18%) than they were on the Karakoram Highway (14%) during the study period. This finding is against the overall perception of local people (Baltistan Times 2020). Possible reasons may be the seasonal shift in the pattern of travelers. Moreover, this study found direct relation between speed of vehicle and injury severity score (p=0.001). Results indicated that travelers at high speed have more injury severity score as compared to those who were driving at slower speed. Similar results were seen in a study conducted in central Ethiopia (Dresse et al.2021).

Among the body regions, upper and lower limbs were the most affected parts (60.1%) followed by Head and neck (56.6%), multiple injuries (26.9%), and fractures (18.1%). Abdomen and pelvis were the least affected sites (13%) but the sufferers normally reported in life threatening condition.

In this study, using seatbelt is strongly associated with injury severity score with p=0.003. Out of all 39.4% has injury severity score of 9-15 who were not wearing seatbelts. Similar results were found by Febres et al., 2020 which indicated that road traffic injuries reach its peak when there is no use of seatbelt. Only 13% motorcyclists used helmet and 22.3% admitted that they were using mobile phone while driving.

Overloading (28%), mechanical fault (10.4%), inadequate lighting (17.1%) and violation of traffic rules were the additional risk factors. Similarly, 6.2% drivers confessed that they consumed addictive substances. Apparently this number seems to be the tip of iceberg as we could not investigate it beyond a certain limit.

5.2 Nature of injury and associated factors

In present study, positive association is established between age and nature of injury (p= 0.002). Majority of the victims were between the ages of 16 to 30 years (38.2%). Respondents of age group 16-30 are more prone to road traffic injuries and similar results are found in previous

study (Mehmood et al. 2020). Similarly, the study revealed a strong association between preexisting illness (CHD, diabetes, and hypertension) and nature of injury (p=0.0001). However, a study conducted by Khoshakhlagh, A. H et al. showed that the occurrence of accidents was higher in people with diabetes and cardiac issues while its association with hypertension is significantly lower.

Furthermore, in this study type of vehicle shows a positive association with nature of injury (p=0.0001). Motorcyclists have maximum number of road traffic accidents of which 37.4% experienced multiple injuries which is highest among all the nature of injuries. Similar results were obtained by Singh et al. (2014). The reason could be no use of seatbelts by motorcyclists and sudden jerk led to neck, head, and other injuries. In this study, there is a direct correlation between rainfall and nature of injury (p=0.002). Results showed that injuries like cuts and opens have a frequency of 47.1% during rainfall, which is the highest among all. Similar results were revealed in previous studies, Saha et al. (2016) which indicated that during the months of November and April, the rate of deaths due to road traffic injuries are higher and these two months have high number of rainfalls as compared to other.

Lastly, nature of injury has a positive correlation with road condition (p=0.001).Results have revealed that majority of the road traffic injuries happened on a steep slope or curvy road (47.6%). Similar results were found in previous studies (Qiu et al., 2022).

5.3 Management Capacity of Health Facilities

Health facilities of Gilgit-Baltistan are generally lacking qualified specialists, paramedics, supplies and sophisticated equipments. Scope of this research was only limited to essential surgical care, emergency interventions and infrastructure. Therefore, it can be concluded that further improvements are needed to uplift the overall management capacity of tertiary care hospitals in Gilgit-Baltistan. Availability of gynecologist, surgeon and anesthetist is a burning issue in the peripheral hospitals (Amimah F et al. 2017).

Lack of running water is also reported during winter in some facilities. Similarly frequent power shortage and availability of disposable items are yet to be addressed in all hospitals.

Conclusion

Recent developments in communication infrastructure are considerably influencing the dynamics of Gilgit-Baltistan. Road traffic accidents are increasing in the region which needs the attention of policy makers and concerned stakeholders. Additionally, findings of this study will be valuable for researchers, practitioners, excise department, and Rescue 1122 in Gilgit-Baltistan. Young people without proper license and knowledge of traffic rules are being reported with traffic injuries. Analysis of injury severity score and nature of injury revealed the frequently involved body regions due to RTAs in Gilgit-Baltistan. During this study period, fracture of lower limbs was the most common injury followed by head and neck involvement along with multiple injuries. It also identified type of vehicle more prone to RTA's and road type vulnerable for accidents. Use of seat belt was almost negligible in the region whereas, high speed was associated with majority of the injuries.

Strict implementation of traffic rules, speed regulation, and scientific designs of roads are needed to avoid the RTA catastrophe. Provincial government is introducing many reforms in the health sector yet majority of the health facilities are lacking human resource, modern surgical equipment and uninterrupted power supply.

Strength

- It is the first study of its type in Gilgit-Baltistan.
- Qualified surgeons, anesthetists and experienced professionals provided assistance while scoring severity of injury.
- Data was collected from all regions of Gilgit-Baltistan.
- Validated tools were used for data collection

Limitations

- Only Injury Severity Score (ISS) was used to measure the injury severity.
- This study was conducted during winter, there may be different findings during summer season due to seasonal migration and tourism.
- Frequency of accidents and pattern may also vary according to season.
- We could not satisfactorily inquire about use of addictive/sedative substances due to privacy concerns and social issues.
- Furthermore, we were largely dependent on attendants/close relatives of the patients regarding the collection of data for some variables which might have produced the probability of social desirability bias to some extent.

Chapter VI: Recommendations

Road safety, prevention of accidents and management of traffic injuries are important aspects of public health. Traffic safety culture is a multi-sectorial approach and every stake holder in society should take responsibility for the traffic safety system. It is not limited to the road users only.

Based on the findings of this study, following recommendations seem relevant and important.

6.1For road users

1. Use seat belt/helmet and avoid high speed.
2. Make sure that your vehicle is free of mechanical fault.
3. Discourage overloading and use of mobile phone while driving.
4. Schedule long route public transport in accordance with weather forecast.
5. Be cautious on steep slopes and curves/turns.
6. Don't irritate heavy vehicles and public transport.
7. Keep your lights dim in markets, *mohallas*, and public places.
8. Avoid addictive/sedative substances.

6.2 For the Community

1. Arrange awareness sessions and walks to promote traffic safety culture.
2. Discourage encroachments and small businesses along roadsides.
3. Discourage digging of roads to make water channels.
4. Training of youth for emergency response and first aid.

6.3 For the Government/Policymakers

1. Traffic education in schools as part of curriculum.

2. Strict surveillance by police and installation of cameras at fixed points to monitor speed of vehicles.
3. Regular checking for fitness /maintenance of vehicles by relevant departments.
4. Scientific designing of roads with special emphasis on steep slopes and sharp curves/turns.
5. Under age and unlicensed driving must be dealt with iron hands.
6. BLS/ACLS Training should be provided to all health care professionals.
7. Timely propagation of weather alerts and updates about main roads.

6.4 Way Forward

Since this cross sectional study was conducted during winter (November to February) with certain limitations. Further researches are suggested to explore the seasonal variations and other contributing factors. Moreover, this study used Injury Severity Score (ISS), which is mainly an objective assessment method. Data collection can be augmented with additional or alternate assessment tools for deeper understanding of the outcome of road traffic accidents.

Management capacity of the hospitals was examined only for essential surgical services and mandatory infrastructure. Detailed assessments are needed to establish the strengths and weaknesses of regional hospitals which may be helpful for equitable distribution of resources.

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ANNEXURE-I

PATTERN OF ROAD TRAFFIC INJURIES

RTA QUESTIONNAIRE

(ID No……)

SOCIODEMOGRAPHIC PROFILE			
1	ADDRESS: 1. Local (GB) 2. Non-local 3.Foreigner	2	GENDER: 1. Male 2. Female 3. Others
3	AGE GROUP: 1. <15 yrs. 2. 16---30 3. 31----45 4. 46-----60 5. >60	4	EDUCATIONAL LEVEL: - 1. No schooling 2. Primary 3. Matric 4.Intermediate 5. Graduation and above
5	MARITAL STATUS: - 1.Single 2. Married 3. Widow/divorced	6	OCCUPATION: - 1. Student 2.Laborer 3. Employee 4. Business 6. Unemployed 7. Others
7	MONTHLY INCOME: 1. <50000 2. Around 100000 3. 1 to 3 Lacs 4. > 3 Lacs	8	ANY PRE-EXISTING ILNESS: 1. CHD 2. Hypertension 3. Diabetes 4. Others 5.None
HISTORY OF RTA			
9	WHERE WERE YOU: 1. Motorcyclist 2. HMV (bus, truck, oil tanker etc.) 3. LMV (car, pajero, jeep, van, tractor etc.) 4. Pedestrian 5. Others	10	STRUCK WITH: 1. Motorbike 2.LMV 3 HMV 4. Overturned 5. Rolling/sliding stones 6. Fell down the road 7. Others
11	DID YOU LOSE CONSIOUSNESS (BLACK OUT) UPON IMPACT: 1. Yes 2. No 3. Don't know	12	SPEED OF VEHICLE : 1. Low 2.Medium 3. High 4. Very high 5. N/A
13	ANY PRE- HOSPITAL CARE GIVEN: 1. Yes 2. No 3. Not known	14	WHERE WAS THE FIRST AID GIVEN: - 1. At Accident site 2. Rescue 1122 3. Nearby health facility 4. Others 5. N/A
15	MODE OF TRANSPORT: 1. Govt. Ambulance 2. Rescue 1122 3. Pvt. Vehicle 4. Others	16	ACCIDENT LOCATION: 1. National highway 2.District road 3. Tourists spot 4. Rural road
17	TIME OF ACCIDENT: 1. Morning (8am-2pm) 2. Evening (2pm-8pm) 3. Night(8pm-8am)	18	DAY OF ACCIDENT:
WHILE DRIVING			
19	USING SEAT BELT: 1.Yes 2. No 3. Don't know 4. N/A	20	USE OF HELMET: 1. Yes 2. No 3. Don't know 4. N/A

21	USING MOBILE /HEAD PHONE: 1. Yes 2. No 3. Don't know 4. N/A	22	HAVING LICENSE? 1. Yes 2. No 3. N/A
23	LIGHTING: 1. Adequate 2. Inadequate 3. Don't know	24	RAINFALL/SNOW: 1. Yes 2. No 3. Don't know
25	ROAD CONDITION; 1. Plain 2.Pot-holed 3. Under construction 4. Muddy 5. Steep slope 6. Curve/Turn	26	MECHANICAL FAULT: 1. Yes 2. No 3. Don't know 4. NA

27	STRESS/ FATIGUE: 1. Yes 2. No 3. Don't know 4.N/A	28	NUMBER OF PASSENGERS: 1. Below capacity 2. Up to capacity 3. Overloaded 5.N/A
29	SPEED OF OTHER VEHICLE: - 1. Low 2. High 3. Stopped 4. N/A	30	DO YOU KNOW ABOUT TRAFFIC RULES: 1. Little much 2. Yes 3. No
31	DO YOU FOLLOW TRAFFIC RULES: 1. Always 2. Most of times 3. No 4. N/A	32	Taken any sedative/addictive substance? 1. Yes 2. No 3. Don't know 4.N/A

33

INJURY SEVERITY SCORE (ISS)

Body Region	AIS Code	AIS Score	Square Top 3 AIS scores	
Head & Neck	1			
Face	2			
Chest/Thorax	3			
Abdomen/Pelvis	4			
Extremities	5			
External	6			
ISS SCORE: 1. Less than 8 2. 9---15 3. 16---24 4. More than 25 (ISS score will be calculated by adding the squares of top three regions)			ISS Score=	NISS Score=

34	NATURE OF INJURY: - 1. Blunt 2. Penetrating 3. Cut/Open 4. Multiple 5. Fracture 6. Sprain 7. Hematoma 8. Abrasion

35	NATURE OF INJURY IS DUE TO: 1. Primary impact 2. Secondary impact

WHO TOOL TO ASSESS EMERGENCY AND SURGIC

DataCol - Tool for Situational Analysis to Assess Emergency and Essential Surgical Care — Page 1 of 6

World Health Organization

Powered by WHO Extranet DataCol

Reference: WHO Integrated Management for Emergency & Essential Surgical Care (IMEESC) toolkit: www.who.int/surgery.
Objective: to assess the gaps in the availability of EESC at resource constrained health facilities.
If you prefer to complete the paper version, please print and return this form by email cherianm@who.int or post or fax to the following address: Dr Meena Cherian, Emergency & Essential Surgical Care project Clinical Procedures Unit, Department of Essential Health Technologies, World Health Organization, 20 Avenue Appia, 1211, Geneva 27,Switzerland, Fax: 41 22 791 4836, www.who.int/surgery.

SECTION A: INFRASTRUCTURE

Country *

Name, Phone no. of the person filling the form

Email:

The email format is "xxxx@yyyy.zzz"

Name and Phone number of Health Care Facility *

Type of Healthcare Facility: Health Center | District/Rural/Community Hospital | Provincial Hospital | General Hospital | Private/NGO/Mission Hospital

Population served by this health facility (Eg: 100.000 or 1.000.000)

The input is of type "number"

	0	1	2	3-4	5-10	11-20	21-50	51-80	81-100	101-200	201-300	301-400	401-500	501-700	701-1'000	1'001-2'000	2'001-5'000	>5'000
Number of beds																		
Number of total admissions in one year																		
Number of total outpatients in one year *																		
Number of total functioning operating rooms (major and minor)																		
Number of patients at this facility requiring minor & major surgical (including Gyn/Obs) procedures per year																		
Number of children (aged less than 15 years) at this facility requiring surgical procedures per year																		
Number of patients to this facility that you refer for surgical intervention to a higher level facility per year																		
How far (in Km) does the average patient travel to get to your health facility for surgical services?																		
If you do not provide surgical services, how far does the average patient travel (in Km) to access surgical services																		

	All the time	Sometimes	Not available

https://extranet.who.int/datacol/survey.asp?survey_id=830 — 06/10/2010

Do you have Oxygen cylinder supply?			
Do you have Oxygen concentrator supply?			
Do you have running water?			
Do you have electricity source?			
Do you have an operational power generator?			
Do you have functioning anaesthesia machine?			
Do you keep medical records ?			
Do you have an area designated for Emergency care?			
Do you have an area designated for Postoperative care?			
Do you have management guidelines available for Emergency care?			
Do you have management guidelines available for Surgery?			
Do you have management guidelines available for Anesthesia?			
Do you have management guidelines available for Pain Relief?			
Do you have blood bank available at the facility?			
Do you have facility to test haemoglobin & urine?			
Do you have functioning X-ray machine available ?			
Do you have functioning Pulse Oximeter available ?			

SECTION B: HUMAN RESOURCES

	Number of Full Time Workers	Number of Part Time Workers	Number Certified/Registered/Licensed
Surgeons (qualified)			
Anaesthesiologist Physician (qualified)			
Obstetrician/gynecologist (qualified)			
General doctors providing surgery			
General doctors providing anesthesia			
Nurse/Clinical/Assistant medical officers providing anesthesia			
Clinical/Assistant medical officers providing surgery			
Paramedics/Midwives			

SECTION C: INTERVENTIONS - DO YOU PROVIDE THESE PROCEDURES?

	Yes / No	Do you refer?	Refer due to lack of skills	Refer due to non-functional equipment	Refer due to lack of Supplies/Drugs
Resuscitation (airway, hemorrhage, peripheral percutaneous intravenous access, peripheral venous cut down)	yes no	yes no	yes no	yes no	yes no
Cricothyroidotomy /Tracheostomy	yes no	yes no	yes no	yes no	yes no

Chest tube insertion	yes no	yes no	yes no	yes no	yes no
Removal of foreign body (throat/eye/ear/nose)	yes no	yes no	yes no	yes no	yes no
Acute burn management	yes no	yes no	yes no	yes no	yes no
Incision & drainage of abscess	yes no	yes no	yes no	yes no	yes no
Suturing (for wounds, episiotomy, cervical & vaginal lacerations)	yes no	yes no	yes no	yes no	yes no
Wound debridement	yes no	yes no	yes no	yes no	yes no
Cesarean Section	yes no	yes no	yes no	yes no	yes no
Dilatation & Curettage gyn/obstetrics	yes no	yes no	yes no	yes no	yes no
Obstetric fistula repair	yes no	yes no	yes no	yes no	yes no
Appendectomy	yes no	yes no	yes no	yes no	yes no
Hernia repair (strangulated, elective)	yes no	yes no	yes no	yes no	yes no
Hydrocele	yes no	yes no	yes no	yes no	yes no
Cystostomy	yes no	yes no	yes no	yes no	yes no
Urethral stricture dilatation	yes no	yes no	yes no	yes no	yes no
Laparotomy (uterine rupture, ectopic pregnancy, acute abdomen, intestinal obstruction, perforation, injuries)	yes no	yes no	yes no	yes no	yes no
Male circumcision	yes no	yes no	yes no	yes no	yes no
Congenital hernia repair	yes no	yes no	yes no	yes no	yes no
Neonatal surgery: abdominal wall defect, colostomy imperforate anus, intussusceptions	yes no	yes no	yes no	yes no	yes no
Cleft lip repair	yes no	yes no	yes no	yes no	yes no
Clubfoot repair	yes no	yes no	yes no	yes no	yes no
Contracture release/skin grafting	yes no	yes no	yes no	yes no	yes no
Closed Treatment of Fracture	yes no	yes no	yes no	yes no	yes no

Open Treatment of Fracture	yes no	yes no	yes no	yes no	yes no
Joint Dislocation treatment	yes no	yes no	yes no	yes no	yes no
Drainage of Osteomyelitis/Septic Arthritis	yes no	yes no	yes no	yes no	yes no
Amputation	yes no	yes no	yes no	yes no	yes no
Biopsy (lymph node, mass, other)	yes no	yes no	yes no	yes no	yes no
Tubal ligation/Vasectomy	yes no	yes no	yes no	yes no	yes no
Cataract surgery	yes no	yes no	yes no	yes no	yes no
Regional anesthesia blocks	yes no	yes no	yes no	yes no	yes no
Spinal anaesthesia	yes no	yes no	yes no	yes no	yes no
Ketamine intravenous anaesthesia	yes no	yes no	yes no	yes no	yes no
General anaesthesia inhalational	yes no	yes no	yes no	yes no	yes no

SECTION D: EMERGENCY EQUIPMENT AND SUPPLIES FOR RESUSCITATION

For details refer WHO IMEESC toolkit www.who.int/surgery/publications/imeesc; WHO ETC guidelines www.who.int/violence_injury_prevention/services; WHOEML www.who.int/medicines/publications

	0 absent	1 available with frequent shortages or difficulties	2 fully available for all the patients all of the time
Resuscitator bag valve & mask (adult)			
Resuscitator bag valve & mask (paediatric)			
Oxygen source: cylinder/concentrator			
Mask & Tubing to connect to oxygen supply			
Stethoscope			
Batteries for flash light			
Suction pump (manual or electric)			
Blood pressure measuring equipment			
Thermometer			
Scalpel handle with blade			
Retractor			
Scissors straight 12 cm			
Scissors blunt 14 cm			
Oropharyngeal airway (adult size)			

Oropharyngeal airway (paediatric size)	☐	☐	☐
Forceps Kocher no teeth	☐	☐	☐
Forceps, artery	☐	☐	☐
Kidney dishes stainless steel	☐	☐	☐
Capped bottle, alcohol based solutions	☐	☐	☐
Gloves (sterile) sizes 6 to 8	☐	☐	☐
Gloves (examination)small, medium, large	☐	☐	☐
Needle holder	☐	☐	☐
Sterilizer	☐	☐	☐
Nail brush, scrubbing surgeon's	☐	☐	☐
Vaginal speculum	☐	☐	☐
Bucket, plastic	☐	☐	☐
Drum for sterile compresses, bandages, dressings	☐	☐	☐
Examination table	☐	☐	☐
Renewable Items Suction catheter sizes 16 FG	☐	☐	☐
Tongue depressor wooden disposable	☐	☐	☐
Nasogastric tubes 10 to 16 FG	☐	☐	☐
Light source (lamp & flash light)	☐	☐	☐
Intravenous fluid infusion set	☐	☐	☐
IV cannula sizes 18,22, 24	☐	☐	☐
Scalp vein infusion set	☐	☐	☐
Syringes 2ml	☐	☐	☐
Syringes 10 ml	☐	☐	☐
Disposable needles # 25, 21,19	☐	☐	☐
Sharps disposal container	☐	☐	☐
Tourniquet	☐	☐	☐
Sterile gauze dressing	☐	☐	☐
Bandages sterile	☐	☐	☐
Adhesive Tape	☐	☐	☐
Needles, cutting & round bodied (for suturing)	☐	☐	☐
Suture synthetic absorbable	☐	☐	☐
Splints for arm, leg	☐	☐	☐
Towel cloth	☐	☐	☐
Absorbent cotton wool	☐	☐	☐
Urinary catheter Foleys disposable #12, 14,18 with bag	☐	☐	☐
Sheeting, plastic for examination table	☐	☐	☐
Waste disposal container	☐	☐	☐

Face masks	☐	☐	☐
Eye protection	☐	☐	☐
Apron, plastic reusable	☐	☐	☐
Soap	☐	☐	☐
Wash basin	☐	☐	☐
Supplementary equipment for use by skilled health professionals Magills Forceps (paediatric)	☐	☐	☐
Magills Forceps (adult)	☐	☐	☐
Endotrachael tubes uncuffed sizes 3.0 to 5.0	☐	☐	☐
Endotrachael tubes cuffed sizes 5.5 to 9	☐	☐	☐
IV Infusor bags	☐	☐	☐
Chest tubes insertion equipment	☐	☐	☐
Laryngoscope handle	☐	☐	☐
Laryngoscope Macintosh blades (adult)	☐	☐	☐
Laryngoscope Macintosh blades (paediatric)	☐	☐	☐
Spare bulbs, batteries for laryngoscope	☐	☐	☐
Cricothyroidotomy set	☐	☐	☐

Submit the form

ANNEXURE-II

(IRB Letter)

AL-SHIFA SCHOOL OF PUBLIC HEALTH
PAKISTAN INSTITUTE OF OPHTHALMOLOGY
AL-SHIFA TRUST, RAWALPINDI

MSPH-IRB/14-12
27th Sep, 2022

TO WHOM IT MAY CONCERN

This is to certify that **Muhammad Ibrahim** S/O **Rozi Ali** is a student of Master of Science in Public Health (MSPH) final semester at Al-Shifa School of Public Health, PIO, Al-Shifa Trust Rawalpindi. He/she has to conduct a research project as part of curriculum & compulsory requirement for the award of degree by the Quaid-i-Azam University, Islamabad. His/her research topic which has already been approved by the Institutional Review Board (IRB) is **"Pattern of road traffic injuries and management capacity of tertiary care hospitals of Gilgit-Baltistan".**

Please provide his/her necessary help and support in completion of the research project. Thank you.

Sincerely,

Dr Ayesha Babar Kawish
Head
Al-Shifa School of Public Health, PIO
Al-Shifa Trust, Rawalpindi

AL-SHIFA TRUST, JEHLUM ROAD, RAWALPINDI – PAKISTAN
Tel: +92-51-5487820-472 Fax: +92-51-5487827
Email: info@alshifaeye.org Web Site: www.alshifaeye.org

ANNEXURE-III

Informed Consent Form

Title of study:

"Pattern of road traffic injuries and management capacity of tertiary care hospitals of Gilgit-Baltistan" **Principal investigator:** Muhammad Ibrahim, MSPH student, Al- Shifa School of public health Rawalpindi.

Purpose: Road traffic 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 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 crashes cost most countries 3% of their gross domestic product. The present study will be conducted to assess the determinants of road traffic injuries and management capacity of tertiary care hospitals of Gilgit-Baltistan. It is expected that findings of this study will draw the attention of policy makers regarding capacity building of healthcare facilities and devising interventions to decrease the incidence of RTIs in Gilgit-Baltistan.

Procedure: Data will be collected from RTI patients using a questionnaire. If a patient is not able to respond, his/her attendants will be asked to fill the questionnaire.

Time required: It is anticipated that it will take approximately 5-7 minutes to complete the questionnaires.

Voluntary participation: Your participation in this study is voluntary. It is up to you to decide whether or not to take part in this study. If you decide to take part in this study, you will be asked to sign a consent form. After you sign the consent form, you are still free to withdraw at any time

and without giving a reason. Withdrawing from this study will not affect the relationship you have, if any, with the researcher. If you withdraw from the study before data collection is completed, your data will be returned to you or destroyed.

Confidentiality: Data will be completely anonymous and reported in aggregate form. Your name will not be collected at any time. After data collection, the questionnaires will be password-protected. Once submitted the researcher will not be able to withdraw responses due to anonymity and de-identified data.

Risks: There will be no serious risk associated with study.

Benefits: There are no direct benefits associated with participation in this study. However, it will assess the determinants of road traffic injuries and management capacity of tertiary care hospitals of G-B. It is expected that findings of this study will draw the attention of policy makers regarding capacity building of healthcare facilities and devising interventions to decrease the incidence of RTIs in Gilgit-Baltistan.

Payment: You will receive no payment for participating in the study.

Right to withdraw from the study: You have the right to withdraw from the study at any time without any consequences.

Contact information: If you have questions about the study, please contact:

Muhammad Ibrahim

Ibrahim_rozi@hotmail.com

Contact # 03412345678

Consent

I have read and I understand the provided information and have had the opportunity to ask questions. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and without cost. I understand that I will be given a copy of this consent form. I voluntarily agree to take part in this study.

Name of Participant_____

Signature of Participant _____

Date _____ (DD/MM/YY)

Statement by the researcher/person taking consent:

I have accurately read out the information sheet to the potential participant, and to the best of my ability made sure that the participant understands that. I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

A copy of this Informed Consent Form (ICF) has been provided to the participant.

Name of Researcher/person taking the consent_____

Signature of Researcher /person taking the consent_____

Date _____ (DD/MM/YY)

ANNEXURE-IV

RESEARCH TIMELINE

Activities	October 2022	Nov 2022	Dec 2022	Jan 2023	Feb 2023	March 2023
Literature search						
Synopsis/ IRB						
Pilot testing						
Data collection						
Data analysis						
Thesis write up						
Thesis defence						

ANNEXURE-V

BUDGET

Budget item	Transport	Stationery and internet	Printing	Publishing
Pilot testing	12000 Rs/-	4000Rs/-	700Rs/-	-
Data collection	15,000Rs/-	7,000Rs/-	-	-
Thesis writeup	6,000Rs/-	5,00Rs/-	5,000Rs/-	8,000Rs/-
Total expenditure	16,000Rs/-	17,000Rs/-	13,000Rs/-	8,000Rs/-
Grand total	63,000 Rs/-			