IN THE HIGH COURT OF SINDH BENCH AT SUKKUR

Constitution Petition No.D-264 of 2026
[Saeed Jahan alias Lala Asad and another v. Province of Sindh and others]

Before:-
Mr. Justice Amjad Ali Bohio
Mr. Justice Ali Haider 'Ada'

Petitioners	:	Saeed Jahan alias Lala Asad and another, *through* Mr. Khan Abdul Ghaffar Khan, Advocate.
Respondents No.1 to 5.	:	*Through* Mr. Ali Raza Balouch, Additional Advocate General Sindh, alongwith Zuhaib Hassan Shaikh, Additional Secretary (Health Department), Dr. Ahmed Mujtaba, Medical Superintendent GMMMC Hospital Sukkur, Dr. Saleh Muhammad Channa, Principal GMMMC Sukkur.
Respondent No.6	:	Dr. Azizullah Bhayo, Head of the Orthopedic Department. GMC Hospital Sukkur. (In Person).
Intervener	:	Dr. Muhammad Sabir Memon, SMBB, Institute of Trauma Karachi, *through* Mr. Mehfooz Ahmed Awan, Advocate.
Date of Hearing	:	05.03.2026.
Date of decision	:	11.03.2026.

O R D E R

Ali Haider 'Ada' J; The petitioners, asserting their status as pro bono litigants, have filed the instant petition primarily seeking a declaration that the newly constructed building meant for the Orthopedic Department at Ghulam Muhammad Mahar Medical College (GMMMC) Hospital, Sukkur, be re-allotted to the said department. The petitioners further seek a declaration that the proposed allotment of the said building to Shaheed Mohtarma Benazir Bhutto Institute of Trauma for the establishment of a Satellite Trauma Center is illegal and without lawful authority. Their principal contention is that the development scheme had originally been approved under the Annual Development Programme (ADP), specifically in the name of the Orthopedic Department.

Therefore, the purpose of the scheme cannot be altered by the Health Department through a mere administrative letter dated 27.01.2025.

2. After issuance of notices, Respondent No.4, the Medical Superintendent of GMMMC Hospital, Sukkur, filed para-wise comments stating that directions had been issued by the Health Department for establishment of a Satellite Trauma Center in the newly constructed building, and relevant correspondence in this regard was annexed with the comments. On behalf of Respondent No.1, the Secretary, Health Department, Government of Sindh, comments were also filed wherein it was contended that the Orthopedic Department in the previous structure is already functional. It was further stated that the Health Department has released Maintenance and Repair (M&R) funds amounting to **Rs. 46,048,500/-** in favour of the Medical Superintendent for repair and renovation of the existing building, and the relevant record has also been placed on file.

3. The record further revealed that Respondent No.6, who appeared in person as Head of the Orthopedic Department, also filed comments asserting that the newly constructed building had, in fact, been approved under the ADP scheme for the establishment of the Orthopedic Department. According to him, without any cogent reason or justification, and even without approval of a revised PC-I by the University Syndicate, which, according to him, has authority over such property, the building was diverted for use by the Shaheed Mohtarma Benazir Bhutto Institute of Trauma, Karachi.

4. During the course of proceedings, learned counsel for the petitioners placed on record certain documents, including extracts from the Planning Manual, the Budget for the year 2024–25, and other relevant material. In compliance with earlier directions of this Court, the respondents also filed additional comments and supporting documents. Moreover, an application bearing No.1491 of 2026 was filed through counsel on behalf of the Shaheed Mohtarma Benazir Bhutto Institute of Trauma, Karachi, seeking its impleadment as a party in the present proceedings, which application was moved by its authorized representative.

5. Learned counsel for the petitioners argued that the scheme had originally been approved under a proper ADP scheme for the establishment of an Orthopedic Department at GMMMC, Civil Hospital, Sukkur, keeping in view the

healthcare requirements of the city. It was submitted that the existing building of the Orthopedic Department is in a dilapidated and unsafe condition and is not suitable for proper functioning. According to the petitioners, the new building was constructed precisely to establish a modern orthopedic facility for strengthening orthopedic services for the population of the region. However, without following any lawful procedure, the said building has now been handed over to the Shaheed Mohtarma Benazir Bhutto Institute of Trauma, Karachi, for the establishment of a Satellite Trauma Center. It was contended that such diversion of the building is contrary to the approved scheme and relevant policy. Learned counsel further argued that although the establishment of a trauma center is indeed a genuine public requirement, the same should be established in a separate building rather than in a building specifically constructed for the Orthopedic Department. He therefore prayed that the instant petition be allowed and that the respondents be restrained from handing over possession of the building to the trauma center.

6. On the other hand, learned Additional Advocate General, in compliance with the directions of this Court, produced certain documents including a PC-I form relating to ADP Scheme No.1240 (2011–12), under which the original scheme was approved for establishment of a 50-bedded Medical and Surgical ICU and expansion of the casualty and OPD departments at GMMMC Hospital, Sukkur. It was further submitted that the said scheme was subsequently revised under ADP Scheme No.1241 and again modified under ADP Scheme No.627 during the year 2014–15. The record further indicates that under ADP Scheme No.450 for the year 2018–19, the project continued in modified form, and later under ADP Scheme No.1257 for the year 2023–24, it was again revised for the establishment of the Orthopedic Department at GMMMC Hospital, Sukkur. It was also pointed out that a feasibility study report had been prepared by the Shaheed Mohtarma Benazir Bhutto Institute of Trauma, Karachi, proposing the conversion of the newly constructed building into a Satellite Trauma and Emergency Response Center at GMMMC Hospital, Sukkur. The learned Additional Advocate General contended that although the building had initially been planned for the establishment of a 50-bedded Medical and Surgical ICU along with expansion of the casualty and OPD departments at GMMMC Hospital, Sukkur, the scheme was subsequently modified and the building was earmarked for the establishment of the Orthopedic Department due to certain

administrative requirements and maintenance considerations. Later on, the Government of Sindh allocated a substantial amount of Rs.46,048,500/- for repair, renovation, and maintenance of the existing orthopedic facility, which work is presently in progress. In these circumstances, the policy decision was taken by the Health Department to utilize the newly constructed building for the establishment of a Satellite Trauma Center. According to him, such a decision is aimed at providing better emergency and trauma care facilities to the public and does not prejudice the functioning of the Orthopedic Department, which will continue to operate from its existing building after renovation. He contended that the petition is misconceived and liable to be dismissed, particularly when the public interest lies in the establishment of additional trauma care facilities.

7. Learned counsel appearing on behalf of the Shaheed Mohtarma Benazir Bhutto Institute of Trauma, Karachi, also supported the stance of the provincial government. He submitted that, pursuant to the feasibility study report, it was found more appropriate to utilize the newly constructed building for a Satellite Trauma and Emergency Response Center so that the facility may provide a broader range of medical emergencies instead of being confined to a single specialty. He further submitted that orthopedic services themselves form an essential component of trauma care, and therefore, the establishment of a trauma center would not diminish orthopedic services but would rather strengthen them within a broader and more specialized emergency care framework. It was emphasized that the Institute of Trauma possesses the requisite expertise and experience in managing such facilities across the Province, and the proposed center would significantly benefit the public at large.

8. We have heard the learned counsel for the parties and have carefully examined the entire material available on record.

9. First and foremost, it is essential to examine the specific requirements that the government intends to address in establishing the trauma center in the newly constructed building at the Civil Hospital area in Sukkur. In this regard, a thorough examination of the issue has been conducted, drawing on various studies and reports. As part of this assessment, the **Assessment of Pakistan's Emergency Care System** held on 14-15 November 2017, highlighted serious gaps in the country's trauma care infrastructure. Specifically, it was noted that while many provinces have trauma centers, most are non-functional, undermining the

system's capacity to make informed decisions regarding the initial transport or transfer of injured patients. For ready refernce the relevant Para is reproduced as under:-

4.4. SCENE CARE, TRANSPORT AND TRANSFER

Stakeholders reported that there is a single emergency access telephone number for health emergencies in some provinces i.e. Baluchistan, Punjab, KPK, Gilgat Baltistan (Rescue 1122) with full coverage especially in urban areas and good linkage with services throughout above mentioned province additionally Sindh province has three different emergency access telephone number i.e. Aman Fourndation-1021, Chhipa Ambulance-1020, Edhi-115, fire brigade Rescue-1299 . There is also legislation that requires fixed and mobile telephone carriers to provide free connection to this emergency access telephone number, and this legislation is enforced. Further, it is estimated that the large majority urban of the population knows and can properly use the emergency access number by memory however rural population don't have access and many of them, none memories these number eventually, though respondents felt that public education on when to utilise emergency care services could help decrease unnecessary calls and unnecessary visits to emergency units. Overall, respondents estimate that one third of the population has coverage by a formal pre-hospital ambulance system in both urban and rural settings, though response times may increase at peak hours in urban settings and are longer in rural areas where the ambulance available to an extent that impacts care. There is no automated caller location functionality, and dispatch centres cannot reliably link prehospital providers to receiving facilities for communication, due to limitations of technology at facilities. There is no any kind of laws to protect bystanders who provide help to the actually ill or injured, but there is currently very limited availability of real-time clinical decision support for ambulance providers, with the exception of the control room system(Sindh, Punjab), which could serve as a potential model for expansion to other areas. In general, information about patient presentation, care provided during transport, and immediate clinical care needs is rarely provided to the receiving facility prior to arrival, but there is a systematic handover protocol that is usually followed on arrival. Participants felt that developing automated caller localization and improving field-to-facility communication technology would be critical innovations, in particular to facilitate better clinical decision support for prehospital providers and receiving facility preparation. Dispatch of public ambulances to the scene is coordinated centrally for both scene response and inter-facility transfer. Private ambulances also provide inter- facility transfer, but are not coordinated by central dispatch, and the group felt that central coordination of public and private dispatch would be helpful for decreasing inter-facility transfer delays. There are no currently system-wide protocols governing pre-hospital clinical care, and not for destination triage. Discussants report that there are unnecessary delays that impact care when patients are initially taken to facilities that cannot meet their needs and subsequently require transfer. Participants felt that clear system-wide protocols in this area, especially regarding a requirement to confirm facility capacity via dispatchers prior to transport, could improve delivery of patients to the facility best able to provide timely needed care. ***There is already an inadequate system of trauma centre (most of the province have trauma centre but not functional) inspection to guide decision-making about initial transport or transfer of injured patients, and there is general consensus amongst dispatchers and providers regarding the capacity of facilities in other***

areas *(e.g., for cardiovascular emergencies and MNCH emergencies). Stakeholders reported that the number of ambulances is generally adequate to transport patients between facilities, but that the system for transport from the scene is stretched at peak times and would benefit from additional ambulances and/or better distribution of ambulance stations. There is regulation on the use of ambulances, and it covers licensing as well as norms and standards. Many participants were agreed time targets for responding to highest priority emergency calls, and there are efforts underway to decrease response times. There is written act especially in one province (Punjab Rescue-1122) that requires both a driver and a care provider for ambulance transport, and there are equipment standards for ambulances but they run with all kind of protocol which derived from international standards. There is systematic process for healthcare facilities to communicate with one another regarding transfers, and it is generally used, though not universally in rural areas. There are no specific system-wide protocols on emergency conditions to guide first level facility providers in initial recognition, resuscitation, and transfer of patients, and the decision to transfer is usually based on individual provider judgment although in some urban areas its appropriate system. Discussants felt that systematic condition-specific protocols to support transfer decisions would be a priority, and that review and better dissemination of the guidance addressing communication around transfers could improve the process and reduce delays to advanced care. There is training and certification of professional prehospital providers in some universities and school of three levels: basic, intermediate and paramedic. It was noted that there is urgent near-term need for expanded numbers of professional prehospital providers. There neither is some community-based first aid training courses/medical first response trained for para medical staff for lay-people provided by different groups i.e. Rescue-1122, PRC, some universities and school in Pakistan however, these are not widely available nor are they regulated or delivered in coordinated fashion. Pakistan Red Crescent (PRC) has a training program for volunteer lay (non-medical) ambulance providers who are formally dispatched during disasters, or very occasionally at other times in areas with limited service. The discussion group felt that general community-based training was not a priority and might even cause bystanders to intervene in harmful ways, but felt that targeted training of professional drivers would be valuable to improving timely care. There is currently no 'Good Samaritan' Law to protect by-standers who provide assistance to the ill or injured, and discussants felt that establishing such a law would be an important priority action.*

10. Moreover, the study on the establishment and evaluation of trauma care in Pakistan, published in the **International Journal of Health Sciences** in 2023, offers valuable insights into the country's emergency care system. The manuscript was submitted on January 9, 2023, revised on March 18, 2023, and ultimately accepted for publication on April 27, 2023. Conducted by a group of doctors, this research assesses the gaps and challenges in trauma care, providing recommendations for improving the trauma system in Pakistan. This research emphasizes the need for strengthening trauma care infrastructure, ensuring proper evaluation, and integrating international best practices to enhance patient outcomes across the country. For ease of understanding, the study/article is summarized as follows:

Establishment and evaluation of Pakistan's trauma registry: Insights from a public sector trauma institute.

Dr. Muhammad Sabir Memon
Chief Orthopedic Surgeon, Dr. Ruth K. M. Pfau, Civil Hospital Karachi. Executive Director, Shaheed Mohtarma Benazir Bhutto Institute of Trauma, Karachi, Pakistan

Ms. Humera Ismail
Epidemiologist & Biostatistician, Manager Research and Development, Shaheed Mohtarma Benazir Bhutto Institute of Trauma, Karachi, Pakistan Corresponding author email: humera. 5june@gmail.com

Professor Shehla Baqi
Consultant Infectious Diseases, Bronxcare Health Systems, Bronx, New York, USA

Mr. Abdul Mannan
Software Engineer, Department of Information Technology, Shaheed Mohtarma Benazir Bhutto Institute of Trauma, Karachi, Pakistan

Mr. Ghulam Murtaza
Nurse Researcher, Post RN BSCN, Department of Research & Development, Shaheed Mohtarma Benazir Bhutto Institute of Trauma, Karachi, Pakistan

Mr. Nooruddin Rahujo
Research and Development Assistant, Shaheed Mohtarma Benazir Bhutto Institute of Trauma, Karachi, Pakistan

Dr. Sehrish Zeeshan
Senior Medical Officer, Department of Research & Development, Shaheed Mohtarma Benazir Bhutto Institute of Trauma, Karachi, Pakistan

Mr. Tanveer Ahmed
Research and Development Assistant, Shaheed Mohtarma Benazir Bhutto Institute of Trauma, Karachi, Pakistan

Mr. Nooruddin Bhatti
System Analysist, Department of Information Technology, Shaheed Mohtarma Benazir Bhutto Institute of Trauma, Karachi, Pakistan

Abstract---*Background: The need for a trustworthy Trauma Registry (TR) to enhance patient care and direct trauma prevention strategies has been recognized for a very long time. Objectives: This research sought to establish, develop, and assess Pakistan's first Digital TR at SMBB Institute of Trauma. Methods: Using U.S. DIv5 TR model as starting point, locally adapted digital TR was developed, and several methodologies were used to analyze prevalence, characters, and first aid care of trauma, as well as the feasibility of establishing a national TR. The research was conducted at SMBBIT for the period from November 2016 to December 2022. Results: A total of 15,217 patient records were entered into the TR of whom Majority of patients suffering trauma were youthful 46% and predominantly male 86%, according to the demographic analysis. Direct admission from the accident scene was common 68%, and the preponderance of incidents involved 59% road accidents. In the majority of cases, 64% family*

members provided primary care. The leading causes of injury were 75% blunt force trauma and 59% automobile collisions. Orthopedic 35%, neurosurgical 22%, and oro-maxillofacial 12% injuries were the most common. In terms of assault-related injuries, gunshot wounds were a prominent cause of trauma. Majority of 78% patients presented with a mild GCS score, mortality rate was 13%, and the vast majority 64% of patients were recovered. Practical implications: Important implications for trauma management, prevention strategies, policymaking, and health education were derived from this study. In regions with a high rate of road traffic accidents, policymakers and urban planners should prioritize enhancing road safety measures. Prioritize adequate training and resources for emergency medical services in trauma care and patient transport. Secure patient transport.

Conclusion: *This study provided valuable insights into the demographics, injury patterns, treatments, and outcomes of trauma patients based on the extensive data compiled in TR. The findings emphasized the significance of pre-hospital trauma care and need for targeted interventions, safety measures, and healthcare education.*
These findings had practical implications for policymakers, city planners, healthcare professionals, and public health advocates, and will guide efforts to enhance trauma care and prevention strategies.

Keywords*---database creation, digital health care, Pakistan, public health, trauma registry.*

Introduction

Trauma is a major cause of morbidity and mortality worldwide, especially in low- and middle-income countries (LMICs) such as Pakistan, where road traffic accidents, falls, burning, and violence are prevalent. These situations necessitate prompt, efficient, and coordinated medical responses. Unfortunately, systemic obstacles such as resource constraints, infrastructure deficits, and a lack of strategic planning based on accurate and pertinent data frequently impede the ability to respond effectively and provide adequate care.

According to the World Health Organization (WHO), trauma is the leading cause of mortality worldwide, accounting for over five million deaths annually. This alarming number is projected to increase by the year 2030, primarily due to the growing prevalence of road traffic injuries, which, as of 2012, are the eighth leading cause of disability-adjusted life years (DALYs), 3-4 Notably, the burden of such injuries falls disproportionately on those in their productive years, resulting in substantial economic consequences. 5-6 In Asia, injuries account for one out of every ten fatalities Compared to countries with a high standard of living, Southeast Asia has double the DALYs per 100,000 individuals. 5 This is a consequence of accelerated economic development and urbanization in developing nations, which are accompanied by an increase in injury-related mortality and morbidity.

Pakistan, which is 2018-2019 registered approximately two vehicles annually, is at the epicenter of this public health crisis 9 According to current statistics, a traffic-related fatality occurs every five minutes, with a predicted 77% increase in incidents for 2020 and a 200% increase by 2030. This not only results in approximately 27,500 deaths and 500,000 injuries annually on Pakistan's roads but also a 3% decline in GDP. The 15-29 age bracket is substantially affected by road traffic accidents & A robust TR is a crucial tool that has proved effective in addressing these issues in many developed nations. A TR is a structured system

for acquiring, storing, and analyzing standardized data on hospitalized injured patients This information can provide an abundance of knowledge regarding the nature and cause of injuries, the care provided, and patient outcomes TRs can inform evidence-based practice and policy, quality improvement initiatives, injury prevention strategies, and trauma research, thereby enhancing patient outcomes and decreasing the burden of trauma on society Established in 2016 in Karachi, Shaheed Mohtarma Benazir Bhutto (SMBB) Institute of Trauma recognized the imperative need for a trauma registry to effectively respond to this escalating crisis. Trauma registries are systematic, exhaustive databases that document the hospital care provided to trauma patients 12 In addition to providing a valuable tool for evaluating patient care and monitoring hospitalization outcomes, they also provide invaluable data for enhancing the quality of trauma care in institutions. 13 Despite their benefits, trauma registries can be difficult to maintain, especially in low and middle-income countries like Pakistan. Inadequate funding, infrastructure, and trained personnel are obstacles, as is the complexity of software acquisition. Even after registry data have been established, regular internal audits are necessary to ensure their accuracy, completeness, and relevance, incredibly, to our knowledge, the SMBB Institute of Trauma is the first public institution in Pakistan to establish a digital Trauma Registry, despite the absence of a National Trauma Registry. This study seeks to describe the development process of the Trauma Registry at the SMBB Institute, analyze initial patient data to gain a better understanding of the population served, and evaluate the data quality of the registry. It aims to guide government bodies, trauma institutes, and public and private health policymakers in Pakistan and other developing nations. Our overarching objective is to enable the Trauma Registry to serve as a paradigm for establishing national and provincial registries throughout Pakistan, thereby enhancing trauma care throughout the country.

Methodology Study design

This study presented a comprehensive narrative of the establishment and development of a locally adapted Trauma Registry (TR) based on a United States-based model. It is based on a descriptive cross-sectional analysis of trauma patients from November 2016 to December 2022 The TR data integrity was thoroughly evaluated and documented in terms of case and data exhaustiveness.

Study location

The investigation was conducted at Shaheed Mohtarma Benazir Bhutto (SMBB) Institute of Trauma, a large government tertiary care hospital. The institute offers specialized in emergency care, cardiothoracic surgery, neurosurgery, oro-maxillofacial, vascular surgery, orthopedics, plastic surgery, ophthalmology, and infectious diseases in collaboration with the hospital's numerous departments.

Original U.S. DIVS Trauma Registry

In 2016, the SMBBIT acquired the US-based DIV5 Trauma Registry for $3000 per year. This desktop application-based computer software had a database design constituted of data fields with drop-down menus that captured a patient's journey from the time of injury, through hospitalization, to the outcome, as well as readmission data for each patient. Each variable's alternatives were coded following the International Classification of Diseases (ICD).

Initially, a senior surgeon was tasked with supervising the Trauma Registry and assembling a team consisting of a registered nurse and computer operators. In 2019, additional personnel, including a data scientist researcher, another registered nurse, and a computer operator, were hired. Due to budget constraints, the U.S.-based company did not provide formal training on the software, ICD classification, terminology, or analysis; however, data entry proceeded consistently

with the Institute of Trauma covering the salaries and operational costs of the TR team.

In November 2016, the DIv5 TR began recording data, and systematic data input commenced in January 2017. While the SMBBIT TR team was unable to access data analysis through this software, they frequently requested data analysis from DIv5 analysts in the United States. Although these analysts were supportive, financial constraints prevented SMBBIT from conducting a thorough analysis. SMBBIT initiated the adaptation of U.S. Div5 to a regional TR in 2021. As a result of the rupee's rapid depreciation against the dollar, the U.S.-based TR had become prohibitively costly. In addition, the local adaptation had to include additional variables and exclude others from the U.S. Technical Report to better serve our local needs. The objective was to develop a succinct, user-friendly, locally applicable, and streamlined TR that could be adopted by other trauma centers in the province and country, including less developed regions than Karachi. Between November 2016 and December 2021, the U.S.-based D1v5 TR recorded a total of 12,801 patients. The relevant information from these entries was transmitted securely to the local institution's TR.

Institutional Trauma Registry Development and Creation
The procedure began with the identification of the trauma patient and the inclusion and exclusion criteria. Due to a blunt or penetrating injury, the definition centered on patients confronting a significant risk of loss of life or limb, or significant permanent disfigurement or disability.

Inclusion criteria
All major trauma patients who presented to the Emergency Department within 72 hours of the injury, regardless of whether they came directly from the injury site, via another facility, or from the outpatient department, and who were admitted or retained in ER for admission, met the inclusion criteria. Patients who Perished after receiving any type of evaluation or treatment at the hospital were included, as well as those who were deceased upon arrival.

Exclusion criteria
It included patients with minor injuries that did not necessitate admission, near-drowning patients, and those whose injury occurred more than 72 hours prior unless specifically referred to the institute for further care. Patients with spontaneous fractures older than 65 were also excluded.

Defining the variable
Using the exhaustive DIv5 as a guide, the team endeavored to construct a valid data set that was easy to collect and accounted for local conditions. At SMBBMIT, a TR Core Committee comprised of senior physicians representing their departments, IT experts, and TR team members was established. The committee was tasked with selecting and defining each data point meticulously, bearing in mind the reason for data collection and the predetermined key performance indicators. The goal was to strike a balance between insufficient data, which would undermine the registry's purpose, and excessive data, which would contribute to inefficiency and be time-consuming and expensive.

Our institution's incident report included demographic information that reflected the provinces and ethnic diversity of Pakistan, information on the mechanism of injury, concise pre-hospital information, the facility that referred the patient, and the mode of arrival at our ED. Our database included the medications administered in the emergency department, the admitting service, patient

tracking, use of a ventilator, blood and blood products, laboratory and radiologic testing, diagnosis, procedures performed, medications administered during admission, final patient outcome, and potential for rehabilitation upon discharge.

The ICD-10 coding language was difficult to comprehend, despite our understanding of the need to record and designate codes to the injury event, treatment, and outcomes. For the convenience of the data entry operator, we chose to evaluate and select pertinent codes from the 95 thousand ICD-10 codes. The Trauma Registry of SMBBIT named "Pakistan Trauma Registry" was officially registered and completed on January 1, 2022, and data input of new patients commenced. Analyses of patient data transmitted between November 2016 and December 2022 were based on variables identified during the development of the registry.

Trauma Registry Application

The trauma registry is a web-based application that facilitates the collection and management of data on traumatic injuries by healthcare professionals. This application was developed with PHP and MySQL on the backend and HTML, CSS, JS, and jQuery on the front end to securely store and analyze data on patient demographics, injury mechanisms, treatments, outcomes, and other relevant factors.

Using PHP, a popular server-side scripting language, and MySQL, a popular open source relational database management system, the application can capture and store large amounts of data efficiently and securely. The application's front end is designed to provide an intuitive and user-friendly interface that facilitates data access and input for healthcare professionals. Enhancing the application's security are features such as user authentication, data encryption, and access controls. The distribution of missing data across trials was evaluated, and no significant differences were observed.

Statistical analysis

The registry data were collected and entered in SMBB's trauma registry and also double check in Excel spreadsheets, with the mean, median, and frequencies indicated.

Results

In total, 15,217 patients were recorded between November 2016 and December 2022 at SMBBIT during 06 years of study. The new institutional TR enabled a thorough analysis of injury patterns, patient demographics, treatments, and outcomes, revealing valuable insights that could inform future clinical, administrative, and policy decisions. The goal was to strike a balance between insufficient data, which would undermine the registry's purpose, and excessive data, which would contribute to inefficiency and be time-consuming and expensive. The demographic features of 15217 patients indicated that majority of patients, 7028(46%), fell within the age range of 18 to 35 years, revealing a clear bias toward younger individuals. 2813(19%) of the patient population was comprised of those between the ages of 36 and 50 years. Those over the age of 65 years were the least represented age group, accounting for only 579(4%) of the total. Regarding gender, data reveal a significant masculine preponderance. Male patients accounted for eighty-six percent, while females account for only fourteen percent. Their geographic distribution revealed that overwhelming majority 13152(86%) were from Sindh, whereas only a small percentage were from Punjab 213(1%), Khyber Pakhtunkhwa (KPK) 76(0.5%), and Balochistan 1764(12%) Other places contributed negligible 12(0.08%) to the total. Analyzing the type of

patient transported from showed that majority of patients 10340(68%) were admitted directly from the scene (accident site). A sizeable percentage 4869(32%) was referred from other health facilities and the ground ambulance 8016(53%) was the most used mode of transportation. Regarding accident location(site), majority 11917(78%) occurred on road. Other locations, such as highways, villages, workplaces, and unidentified sites, accounted for lesser proportions of the total number of accidents. The pluralities of patients' caregivers were family members, accounting for sixty-four percent of the total. Unrelated accounted for 26% of the total, while unknown attendants accounted for 11%. Information regarding day and time trauma patients arrived at SMBB Institute of Trauma were also analyzed and distribution of data across the seven days of the week was relatively uniform, ranging from 12.9% to 15.5% Sunday and Monday appeared to be the busiest days, with 16.5% and 15.2% of total arrivals, respectively, while Saturday appeared to be the least active day, with 12.9% of the total patient count. Arrival times of the patients showed that majority of patients 6755(44%) appeared in a the evening (16:00-23:59), followed by the afternoon (08:00-15:59), which accounted for 5096(34%) of total arrivals. The morning hours (00:00-07:59) saw the fewest patients, with 3366(22%) of all arrivals occurring during this time. (Table I)

Table II depicted that characteristic of trauma patients at SMBB, including the category of injury, the mechanism of injury, and the diagnosis of injury of patients. Beginning with injury type, blunt trauma was the most prevalent, accounting for nearly 11407(75%) of all injuries. Penetrating injuries accounted for 2313(15%) of all injuries, while burns accounted for only a minor portion 331(2%). Other injuries accounted for 235(2%) of the total. The mechanism of injury provided insight into the causes of these injuries. Over half of the injuries 8334(59%) were caused by road traffic accident (RTA). while falls accounted for 3274(23%). Assaults and burn accounted for approximately 997(7%) and 331(2%) of injuries, respectively. Suicides, explosives, and building collapses were extremely uncommon causes of injury. The "Others" category accounted for 8% of the cases. Of 5224 patients involved in motorcycle accidents, there was documentation regarding helmet use found in 2832(54%) records. Of these, 101 (4%) reported wearing helmets. Of 1,268 motor vehicle collisions (MVC), documentation regarding safety belts was found in 518 records, of which only 9 (2%) individuals reported wearing them, whereas data on airbags was documented in 329 records of MVCs, with no vehicle reporting that any airbags were deployed/available. The breakdown of injury diagnosis revealed that trauma orthopedics 5282(35%), neurosurgery 3380(22%), and oro-maxillofacial injuries 1841(12%) were the most prevalent diagnoses. Other disciplines accounted for 2920(19%) of cases, while general surgery accounted for 1794(12%) of diagnoses.

Many patients had poly-trauma with multiple injuries and a total of 21717 injuries were recorded in 15,217 patients over the study period. However, for the purposes of this study, only the first trauma diagnosis entered for each of the 15217 patients was analyzed with orthopedic injury diagnosed in 5282 (24%), neurosurgical in 3380 (16%), and oral-maxillofacial in 1841(9%). Comprehensive breakdown of the types of diagnoses made for trauma center patients across four main diagnostic areas Orthopedic, Neurosurgery, Oro-maxillofacial surgery, and General surgery. A total of 5282(35%) patients, were diagnosed with orthopedic injuries. In this category, the most common injuries were femoral fractures in 1592(30%) patients, and tibia fractures in 1566(30%) patients, followed by radius ulna fractures in 562(11%) patients, and humerus fractures in 668(13%) patients. The remaining percentage consisted of injuries such as metatarsal or metacarpal fractures, clavicle, patella, pelvic, and other unidentified fractures. In

neurosurgery, a total of 3380(22%) patients patients were treated. The preponderance of these patients 2917(86%) 2917(86%) had brain injuries. Spinal injuries were also observed, albeit at a much lower frequency 263(8%) patients, and there were also cases of "Others brain injuries" 200(6%) patients. The most frequent injury among the 1841(12%) patients treated in this category was a fracture of the sinus fracture in 983(53%) patients, followed by zygomatic fractures in 366(20%) patients, and mandible fractures in 300(16%) patients. Lefort fractures and other facial fractures were uncommon. General surgery treated 1,794(12%) patients, prevalent being hemo-pneumothorax in 728(41%) patients, followed by rib fractures in 207(12%) patients, and free fluid in 154(9%) patients. In addition, there were cases of liver injury, splenic injury, emphysema, and other injuries that were not specified (Table II).

Of all traffic collisions, accidents involving motorcycles accounted for 5,224(63%) of the cases. This demonstrated that motorcyclists were particularly vulnerable group in traffic and were more prone to accidents. With 1,268(15%) cases, motor vehicle collision (MVC) accidents were the second most common. Despite the anticipation that car occupants may be more protected due to the structural design of automobiles, these numbers indicated that car accidents continue to be major cause of trauma. Only 52(0.6%) instances of bicycle collisions have been documented. It is important to observe that this could indicate either a genuinely lower risk or an underrepresentation due to factors like low bicycle usage or underreporting of accidents. With 1,548(19%) cases, pedestrians were also substantially affected by road accidents. This emphasized the dangers pedestrians encountered in traffic environments, especially in regions with high vehicle speeds or inadequate pedestrian infrastructure. Finally, "Others" category accounted for 242(3%) cases. This data highlighted the significant contribution of road traffic accidents to trauma, with various categories of injuries. (Figure 1) traffic

Assault-related injuries observed at the trauma center were separately categorized. With 48(5%) incidents, knife-related assaults were the least frequent category. Despite their rarity, knife wounds potentially caused severe trauma, particularly when vital organs or major blood vessels were affected. With 371(37%) cases, gunshot wounds were significant source of assault-related trauma. Due to the high energy of the bullet impact, extensive tissue damage was seen and affected multiple organ systems, these wounds were extremely severe. 199(20%) incidents were caused by glass-related injuries. Injuries caused by bites were extremely uncommon, with only four incidents recorded. The others category of assault contains 375(38%) cases, signifying a variety of additional assault methods not specified in the given categories. This could include blunt force trauma, other weapon-related injuries, or even strangulation (Figure 2).

Burn injuries treated at the trauma center were also categorized. Electrical injuries were the most common, with 218(66%) reported cases. These wounds were caused by direct contact with an electrical current and resulted in severe injuries due to the electrical current's path through the body, which can affect internal organs and tissues.

Only 18(5%) cases of thermal burns, typically caused by exposure to heat sources such as fire, heated surfaces, and hot liquids or steam. Thermal burns necessitated extensive treatment and a protracted recovery time, despite their relatively low incidence in this data set. 65(20%) cases of chemical burns were caused by contact with corrosive substances, such as strong acids and alkalis, "Others unknown burns category includes 30(9%) cases of burns from unidentified or other sources.

These may be the result of causes not enumerated here, such as radiation or friction burns (Figure 3).

Initial patient evaluation was based on Glasgow Coma Scale (GCS) score. Majority of patients 78% presented with a mild GCS score (13-15), representing 9807 of cases. Moderate cases (GCS 9-12) accounted for 1078(9%), while severe cases (GCS 3-8) accounted for 1693(14%). At presentation, the median systolic and diastolic blood pressures were 119 and 75, respectively. Radiological procedures were the most prevalent, accounting for Seventy-six percent of the total number of procedures 50326. Among these was CT head scans 8052(16%), X-ray Chest 13684(27%), and other radiological procedures 28590(57%). Surgical procedures accounted for 8,541(15%) percent of total procedures. ORIF was the most common surgical procedure 1728(20%), followed by wound debridement 1028(12%), craniotomy 613(7%), chest tube insertion 645(6%), amputation 283(3%), and other surgical procedures 4244(50%). A total 135,532 medications were administered during hospitalization. Of these, 15565 (12%) were antibiotics, of which the most prescribed was Ceftriaxone, 5242 (32%), followed by amoxicillin-clavulanate, 3986 [26%] (Table III)

The average patient hospitalization lasted 12-14 days, average duration at ICU or high dependency unit was 2+4 days. In addition, patients were on a ventilator for a mean duration of 3±5 days. In terms of patient outcomes, 13% of patients (1887 individuals) died as a result of their injuries, which represented the mortality rate. In addition, a significant proportion of patients (18% or 2,766) were already deceased upon arrival at the hospital Positively, majority of patients (64 percent, or 9599 individuals) were discharged from the hospital. The rehabilitation potential was documented by providers that temporary disability expected to return to previous level of function in 6838(51%) patient records. A small number of patients (4 percent or 619 people) decided to depart against medical advice (LAMA). The time of death 2 24 hours was 965(51%) recorded. Total 4932 (32%) Brought dead (BD) were reported in ED from the period of 2019 to 2022, and 2766(56%) were trauma BD cases. (Table IV)

The quality of the data was assessed, and case completeness was found in 79.8%. Data completeness for registry variables, 84% date and time of arrival, 100% for demographics, 85% for injury date and time and place, 84% for protective devices, 80% for whether injury work-related, 99% for the mechanism of injury. For data completeness from referring facility to SMBBIT, it was 99% for facility location, 88% for a mode of transportation, In the case of the initial ED assessment, data completeness was 89% for vital signs, 94% for GCS. Patient tracking data was complete for location services in 90%, ventilator use in 98%, and blood in 89%. Data completeness regarding procedures was 93% and for diagnoses was 93%. In the case of outcome data, completeness for discharge status was 88%, duration of ICU stays 98%, ventilator days 96%, and total hospitalization 95%.

Table 1: Demographic of trauma patients presented to SMBB Institute of Trauma

Variables	*Frequency*	*%*
Age in years (median, range)	*27 (1-99)*	
1-12	*1742*	*11.4*
13-17	*1511*	*9.9*
18-35	*7028*	*46.2*

36-50	*2813*	*18.5*
51-65	*579*	*3.8*
>65	*579*	*3.8*
Gender		
Male	*13124*	*86.2*
Female	*2093*	*13.8*
Province		
Sindh	*13152*	*86.4*
Punjab	*213*	*1.4*
Khyber Pakhtunkhwa (KPK)	*76*	*0.5*
Balochistan	*1764*	*11.6*
Unknown	*12*	*0.08*
Transported from		
Direct from scene (Site) to SMBB	*10340*	*68.0*
Referred from Health Facility	*4869*	*31.9*
Unknown	*8*	*0.05*
Mode of Transport		
Counts	*15173*	*99.7*
Ground ambulance	*8016*	*52.8*
Private vehicle	*5030*	*33.2*
Walk-In	*215*	*1.4*
Police	*110*	*0.7*
Helicopter Ambulance	*6*	*0.03*
Unknown	*1796*	*11.8*
Arrival Day		
Monday	*2323*	*15.3*
Tuesday	*2060*	*13.5*
Wednesday	*2227*	*14.6*
Thursday	*2002*	*13.2*
Friday	*2274*	*14.09*
Saturday	*1970*	*13.0*
Sunday	*2361*	*15.5*

Arrival Time (Hours)		
00:00 - 07:59	*3366*	*22.1*
08:00 – 15:59	*5096*	*33.5*
16:00 – 23:59	*6755*	*44.4*
Location (Site) of Accident		
Home	*983*	*6.5*
Road	*11917*	*78.3*
Highway	*335*	*2.2*
Village	*1125*	*7.4*
Workplace	*546*	*3.6*
Others	*23*	*0.2*
Unknown	*288*	*1.8*
Patients Accompanied		
Counts	*14170*	*93.1*
Immediate family member	*9023*	*63.7*
Unrelated	*3618*	*25.5*
Unknown	*1529*	*10.8*

Table II: Breakdown of trauma patients, characteristics and diagnoses

Variables	*Frequency*	*%*
Type of Injury		
Counts	*15217*	*100.0*
Blunt	*11407*	*74.9*
Penetrating	*2313*	*15.2*
Burn	*331*	*2.2*
Other	*235*	*1.5*
Unknown	*931*	*6.1*
Mechanism of Injury		
Counts	*14190*	*93.3*
Road Traffic Accident (RTA)	*8334*	*58.5*
Fall	*3274*	*23.1*
Assault	*997*	*7.0*
Burn	*331*	*2.3*

Suicide /self harm	*31*	*0.2*
Cylinder /Batter blast	*39*	*0.3*
Bomb Blast	*32*	*0.2*
Building Collapse	*13*	*0.1*
Domestic Violence/ Physical Abuse	*19*	*0.1*
Others	*1120*	*7.9*
Usage of Productive Devices		
Helmet use	*5224*	
Counts	*2832*	*54.2*
Wearing helmet	*101*	*3.6*
Not wearing helmet	*2731*	*96.4*
Seat Belt use	*1268*	
Counts	*518*	*40.9*
Wearing seat belt	*9*	*1.7*
Not wearing seat belt	*509*	*98.3*
Air Bags use	*1268*	
Counts	*329*	*25.9*
Airbags deployed	*0*	*0.0*
Not deployed	*329*	*25.9*
Firstly injury Diagnosis Entered	*21717*	
Trauma Orthopedic	*5282*	*24.3*
Femoral fractures	*1592*	*30.1*
Tibia Fibula	*1566*	*29.6*
Humerus fractures	*668*	*12.6*
Matatarsal & Metacarpal	*187*	*3.5*
Clavicle fracture	*170*	*3.2*
Patella	*110*	*2.1*
Pelvic fracture	*136*	*2.6*
Radius Ulna	*562*	*10.6*
Other orthopedic fractures	*291*	*5.5*
Trauma Neurosurgical	*3380*	*15.5*
Brian injury	*2917*	*86.3*

Spine injury	*263*	*7.8*
Other	*200*	*5.9*
Trauma oral Maxillo Facial surgery	*1841*	*8.5*
Mandible fracture	*300*	*16.3*
Zygomatic fracture	*366*	*19.8*
Lefort fracture	*128*	*6.9*
Sinus fracture	*983*	*53.4*
Other facial fracture	*64*	*3.4*
General Surgery	*1794*	*8.3*
Hemo-Pneumothorax	*728*	*40.6*
Rib Fracture	*207*	*11.5*
Free fluid	*154*	*8.6*
Liver injury	*138*	*7.7*
Spleen injury	*95*	*5.3*
Emphysema	*69*	*3.8*
Other general surgery procedure	*403*	*22.5*
Other injury Diagnosis	*9420*	*43.4*

Table III: Clinical Presentation and management of trauma patients

Variables	*Frequency*	*%*
Initial Assessment		
GCS Score	*12578*	
Mild (13-15)	*9807*	*78.0*
Moderate (9-12)	*1078*	*8.5*
Sever (3-8)	*1693*	*13.5*
Comorbid		
Blood pressure	*13493*	*88.7*
Systolic (Median, range)	*119 (20-269)*	
Diastolic (Median, range)	*75(16-191)*	
Procedures Performed	*66674*	
Radiolgist procedure	*50326*	*75.5*
X-ray chest	*13684*	*27.2*
CT brain	*8052*	*15.9*
Other radiologist procedure	*28590*	*56.8*
Surgical procedure	*8541*	
Open reduction internal fixation (ORIF)	*1728*	*20.2*

Wound debridement	*1028*	*12.0*
Craniotomy	*613*	*7.2*
Chest tube insertion	*645*	*7.5*
Amputation	*283*	*3.3*
Other surgical procedure	*4244*	*49.7*
Medications	*1355532*	
Other medication	*119967*	*88.5*
Antibiotics	*15565*	*11.5*

Table IV: Clinical outcomes of the trauma patient treated at SMBB institute of trauma

Variables	*Frequency*	*%*
Hospital Length of Stay in days Mean(S.D)	*12 ± 14*	
ICU length of stayin days mean (S.D)	*2 ± 4*	
On ventilators in days	*3 ± 5*	
Outcome	*15044*	*98.6*
Discharged	*9599*	*63.8*
Died	*1887*	*12.5*
Left against medical advice	*619*	*4.1*
Shift to another services	*41*	*0.3*
Shift to Edhi home	*8*	*0.05*
Shift to jail ward	*6*	*0.04*
Unknown	*2884*	*19.2*
Time of death	*1887*	
<24 hours	*922*	*48.9*
≥24 hours	*965*	*51.1*
Brought death (BD)	*4932*	
Trauma (BD)	*2766*	*56.1*
Non-trauma BD	*2166*	*43.9*

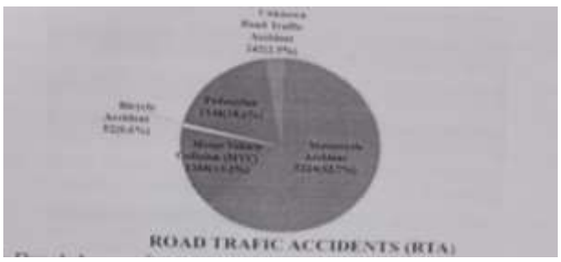

Figure 1: Breakdown of road traffic accident (RTA) of 8334 (59%) patients presented at SMBB Institute of Trauma.

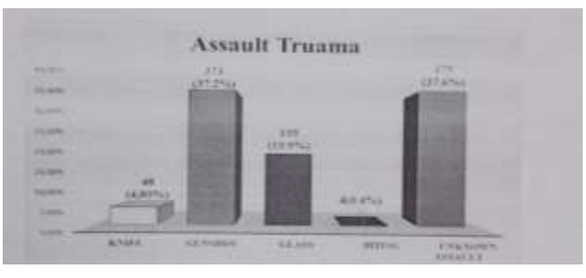

Figure 2: Breakdown of assault trauma of 997 patients presented at SMBB Institute of Trauma.

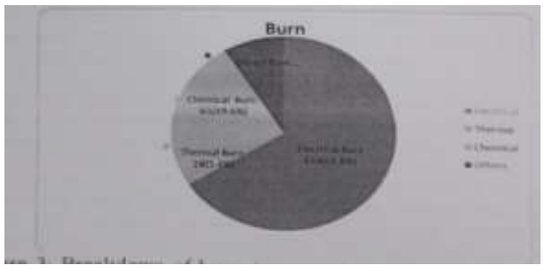

Figure 3: Breakdown of burn trauma of 331 patients presented at Trauma center.

Discussion

This research paper focuses on the findings of the first trauma registry in a metropolitan city of Pakistan, which aims to enhance emergency care and trauma management. Trauma, a leading cause of death and disability worldwide, requires efficient data collection and analysis to enhance medical response and save lives. With this pioneering initiative, the city aims to revolutionize its emergency healthcare system by establishing a comprehensive database of trauma incidents, allowing medical professionals to gain invaluable insights and implement evidence-based practices. The study observed high data completeness percentages for various registry variables. Most importantly, first in-hospital physiological observations were reported in around eighty percent of the population. In a recent study from neighboring country India, these observations are reported as major indicator for prediction of mortality in patients attending emergency departments, 17 Another study has reported that clinical and calculated variables, such as GCS are difficult to collect in trauma registries. 18 These findings are also important in predicting 30-days survival in severely injured traumatic patients, 19 However, in the current study, missing values were limited. These findings indicate the overall robustness and high level of completeness of the data, establishing a solid foundation for comprehensive analysis and meaningful research conclusions.

In this study, an analysis of a comprehensive dataset encompassing over fifteen thousand patients who sought treatment at a trauma center over a span of six years was included. The median age of the patients was determined to be 27 years, highlighting the predominance of trauma incidents affecting the younger population. Additionally, a significant gender disparity was observed, with males constituting the majority, accounting for 86% of the cases. Previous international studies findings from trauma registries also reported younger age group and males as predominant individuals. 18,20 However, a study conducted in England has reported older age people in majority who attended trauma centers 21 A possible reason behind this increase age in this study is that the mechanism of injury reported in majority of the patients in England was fall. However, among the cases examined, falls accounted for 23% of the total incidents in the current study.

Blunt trauma emerged as the most prevalent type of injury, accounting for 75% of the cases analyzed in this study. Road Traffic Accidents (RTAS) constituted the primary injury mechanism in 59% of the cases, with motorcycle accidents comprising 63% and motor vehicle collision injuries contributing to 15% of the cases. Notably, a strikingly low percentage of individuals (only 0.07%) were found to be wearing seat belts at the time of the incident, while the deployment of airbags was absent across all vehicles examined. Similar findings were also reported in previous studies as well 18,22-24 A systematic review of trauma registries findings from low and middle income countries have also reported findings similar

to the current study 25 These findings underscore the urgent need for enhanced road safety measures, emphasizing the importance of promoting seat belt usage and exploring opportunities to increase airbag deployment in vehicles to mitigate the severity of injuries resulting from road accidents.

Among the patients included in the current study, ground ambulance emerged as the predominant mode of arrival, accounting for 53% of cases, indicating its crucial role in timely transportation for emergency care. Analysis of the data also revealed that roads were the most common location of injury, representing 78% of all cases, underscoring the urgent need for targeted road safety measures. Various previously published studies from Karachi have also stated serious concern on the road traffic injury in Karachi due to the poor road conditions. 26-28 Notably, the emergency department recorded the presence of 32% of patients who were brought in deceased, and of these cases, 56% were classified as traumatic brought dead cases. In an international study, death on arrival was reported in 1.3% patients which is remarkably low compared to the current study finding 20 These findings shed light on the significant challenges faced in pre-hospital care and emphasize the importance of effective emergency response strategies to improve patient outcomes.

As for the patient outcomes analyzed in this research, it was found that 64% were discharged from the hospital, while 13% unfortunately succumbed to their injuries. Somewhat similar mortality was also reported in previous studies as well 29,30 The average duration of stay in the ICU was 2 days, with an average of 3 days on a ventilator, and a total hospital stay duration of 12 days. Among the patients who were discharged to their homes, it was documented by healthcare providers that temporary disability was expected in 51% of the patient records, with the potential for a return to their previous level of function. This highlights the importance of rehabilitation services in supporting patients recovery and facilitating their reintegration into their daily lives. These findings underscore the significance of ongoing medical management and rehabilitative interventions to optimize functional outcomes for a substantial proportion of discharged patients. The research paper assessed the quality of the data and found a case completeness rate of 79.8%.

It is important to acknowledge and address certain limitations that may affect the interpretation and generalizability of the current study findings. First, this trauma registry typically focuses on specific variables of interest related to trauma care and outcomes. While this allows for in-depth analysis within the designated scope, it may limit the ability to explore other potential factors or outcomes that are not captured in the registry. Secondly, trauma registry data is typically collected within a specific time period. This temporal limitation may restrict the analysis to a particular timeframe and may not capture long-term outcomes or changes in practice over time. Lastly, this trauma registry is based on one trauma center of Karachi city. Although, SMBB is one of the largest trauma centers of Karachi, however, as this is a densely populated city, inclusion of data from larger healthcare center could increase the authenticity and generalizability of the findings. Despite these limitations, the current study has several strengths. The study findings have filled a critical gap in knowledge by providing insights into the epidemiology, patterns, and outcomes of trauma in this specific population. This information can enhance our understanding of the unique challenges and factors influencing trauma care in densely populated urban areas. The findings from the trauma registry serve as a foundation for evidence-based decision making in trauma care. One of the important points is the application of trauma registry in a low middle income country as reported in previous literature that For decades,

trauma registries have been used in wealthier countries for injury surveillance and clinical governance, but their adoption has lagged in low-income and middle-income countries, 31,32 Policymakers, healthcare providers, and administrators can utilize this information to develop targeted interventions, allocate resources effectively, and implement preventive strategies to improve the quality and efficiency of trauma care services in densely populated cities like Karachi. In addition, the study findings recommend further research and innovation in the field of trauma care. Researchers can build upon the initial findings to explore more specific research questions, investigate novel interventions, and develop evidence-based guidelines tailored to the unique needs of densely populated urban areas. The study findings serve as a catalyst for future studies that contribute to the advancement of trauma care knowledge and practice.

Conclusion

Our research highlighted the significance of trauma registry in understanding the dynamics of trauma care, particularly in Pakistan. Our investigation of various locally implemented and developed trauma registries revealed their significant potential for collecting detailed injury epidemiology, facilitating decisions based on evidence, and driving quality improvements in trauma care. In addition, our research has revealed critical voids in data collection and patient care during transport, highlighting the need for standardized data collection tools and improved emergency medical services. We advocated for the widespread implementation of trauma registries, not only as instruments for data collection and research but also as instruments that can provide crucial insights into injury prevention and management. National trauma registries should be further developed and standardized, as they would shed light on the specific challenges our society is facing in providing high-quality trauma care. Lastly, collaboration between healthcare providers, policymakers, and researchers is necessary to ensure the effective utilization of these registries in influencing the future of trauma care in Pakistan. Moreover, data revealed that transport accidents were the leading cause of death in Karachi, particularly among the youthful population. Ambulances and other emergency medical services must be upgraded to improve patient transportation. Trauma patients required the establishment of emergency medical care facilities (including emergency trauma centers) at subdivision levels to receive high-quality care.

Conflict of interest

None.

Acknowledgment

Would like to express my sincere appreciation to Mr. Zubair Qureshi (Incharge, IT Department) for their valuable contributions and support for his technical support and assistance in IT related matters throughout this research.

References

1. Bhandarkar P, Patil P, Soni KD, O'Reilly GM, Dharap S, Mathew J, et al. An Analysis of 30-Day in-Hospital Trauma Mortality in Four Urban University Hospitals Using the Australia India Trauma Registry. World J Surg. 2021 Feb;45(2):380-389. doi: 10.1007/s00268-020-05805-7.

2. Botchey IM Jr, Hung YW, Bachani AM, Saidi H, Paruk F, Hyder AA. Understanding patterns of injury in Kenya: Analysis of a trauma registry data from a National Referral Hospital. Surgery. 2017 Dec;162(65):S54-562. doi: 10.1016/j.surg 2017.02.016.

3. *Boughton O, Jones GG, Lavy CB, Grimes CE. Young, male, road traffic victims: a systematic review of the published trauma registry literature from low and middle income countries SICOT J 2015 Jun 15,1:10. doi: 10.1051/sicotj/2015007.*
4. *Brooks E. The Current and Future Use of Registries in Health Information Systems. Geneva: World Health Organization, 1974*
5. *Chiang YT, Lin TH, Hu RH, Lee PC, Shih HC. Predicting factors for major trauma patient mortality analyzed from trauma registry system. Asian J Surg. 2021 Jan;44(1):262-268. doi: 10.1016/j.asjsur 2020.06.014.*
6. *Chichom-Mefire A, Nwanna-Nzewunwa OC, Siysi VV, Feldhaus 1, Dicker R, Juillard C. Key findings from a prospective trauma registry at a regional hospital in Southwest Cameroon. PLoS One. 2017 Jul 19;12(7):e0180784. doi: 10.1371/journal.pone.0180784.*
7. *Chokotho L, Croke K, Mohammed M. Mulwafu W, Bertfelt J, Karpe S, et al. Epidemiology of adult trauma injuries in Malawi: results from a multisite trauma registry. Inj Epidemiol. 2022 Apr 19;9(1):14. doi: 10.1186/$40621-022-00379-5.*
8. *Di Saverio S, Gambale G, Coccolini F, Catena F, Giorgini E, Ansaloni L, et al. Changes in the outcomes of severe trauma patients from 15-year experience in a Western European trauma ICU of Emilia Romagna region (1996-2010). A population cross-sectional survey study. Langenbecks Arch Surg 2014 Jan;399(1):109-26. doi: 10.1007/s00423-013-1143-9.*
9. *Difino M, Bini R, Reitano E, Faccincani R, Sammartano F, Briani L, et al. Epidemiology of trauma admissions in a level 1 trauma center in Northern Italy: a nine-year study. Updates Surg. 2021 Oct;73(5):1963-1973. doi: 10.1007/s13304-021-00991-y.*

10. *Dixon JR, Lecky F, Bouamra O, Dixon P, Wilson F, Edwards A, et al. Age and the distribution of major injury across a national trauma system. Age Ageing. 2020 Feb 27,49(2):218-226. doi: 10.1093/ageing/afz151.*

11. *Heinänen M, Brinck T, Lefering R, Handolin L, Söderlund T. How to validate data quality in a trauma registry? The Helsinki Trauma Registry Internal Audit. SJS. 2019:1-9.*

12. *Hyder AA, Razzak JA. The challenges of injuries and trauma in Pakistan: an opportunity for concerted action. Public Health 2013 Aug: 127(8):699-703.*

13. *Jung YH, Wi DH, Shin SD, et al. Comparison of trauma systems in Asian countries: a cross-sectional study. Clin Exp Emerg Med. 2019,6(4):321-329.*

14. *Khurshid A, Sohail A, Khurshid M, Shah MU, Jaffry AA. Analysis of Road Traffic Accident Fatalities in Karachi, Pakistan: An Autopsy-Based Study. Cureus 2021 Apr 13,13(4):e14459. doi: 10.7759/cureus. 14459*

15. *Kruk ME, Gage AD, Arsenault C, Jordan K. Leslie HH, Roder-DeWan S, Adeyi O, Barker P, Daelmans B, Doubova SV, English M, Garcia-Elorrio E, Guanais F. Gureje O, Hirschhorn LR, Jiang L, Kelley E, Lemango ET, Liljestrand J. Malata A, Marchant T, Matsoso MP, Meara JG, Mohanan M. Ndiaye Y, Norheim OF, Reddy KS, Rowe AK, Salomon JA, Thapa G, Twum-Danso NAY, Pate M. High-quality health systems in the Sustainable Development Goals era: time for a revolution. Lancet Glob Health. 2018 Nov;6(11):e1196-c1252.*

16. *Lao Z, Gifford M, Dalal K. Economic cost of childhood unintentional injuries. Int J Prev Med. 2012 May, 3(5):303-12.*

17. Mehmood A, Razzak JA. Trauma registry needs and challenges In developing countries. J Pak Med Assoc. 2009;59(12):807-808.

18. Moore L, Clark DE. The value of trauma registries. Injury. 2008;39:686-95.

19. Muhammad K, Shaikh S, Ashraf J, Hayat S. Characteristics, reasons and patterns of Road Traffic Injuries presenting in emergency department of a tertiary care public hospital in Karachi. Pak J Med Sci. 2022 Mar-Apr:38(4Part-II):862-867. doi: 10.12669/pjms.38.4.4490.

20. National Transport Research Centre.

21. Organization for Economic Co-operation and Development, World Health Organization. Health at a glance Asia/Pacific 2012. Paris: OECD Publishing: 2012.

22. Paradis T, St-Louis E, Landry T, Poenaru D. Strategies for successful trauma registry implementation in low and middle-income countries-protocol for a systematic review. Syst Rev 2018 Feb 21,7(1):33. doi: 10.1186/s13643-018-0700-2.

23. Razzak MI, Imran M, Xu G. Big data analytics for preventive medicine. Neural Comput Appl. 2020;32(9):4417-4451.

24. Report of the National Road and Safety Strategy 2018-2030 Pakistan Ministry of Communications.

25. Rosenkrantz L, Schuurman N. Arenas C, Nicol A, Hameed MS. Maximizing the potential of trauma registries in low-income and middle-income countries. Trauma Surg Acute Care Open. 2020 May 12,5(1):c000469. doi: 10.1136/tsaco-2020-000469.

26. Salman S, Saleem SG, Shaikh Q. Yaffee AQ. Epidemiology and outcomes of trauma patients at The Indus Hospital, Karachi, Pakistan, 2017-2018. Pak J Med Sci. 2020 Jan;36(1):S9-S13. doi: 10.12669/pjms 36.ICON-Suppl.1717.

27. Sengoelge M, Laflamme L, El-Khatib Z. Ecological study of road traffic injuries in the eastern Mediterranean region country economic level, road user category and gender perspectives. BMC Public Health. 2018;18:236.

28. Shanthakumar D, Payne A, Leitch T, Alfa-Wali M. Trauma Care in Low- and Middle-Income Countries. Surg J (NY). 2021 Oct 22,7(4):e281-e285.

29. Shivasabesan G, O'Reilly GM, Mathew J, Fitzgerald MC, Gupta A, Roy N, et al. Establishing a Multicentre Trauma Registry in India: An Evaluation of Data Completeness. World J Surg 2019 Oct;43(10) 2426-37. doi: 10.1007/s00268-019-05039-2

30. World Health Organization. Global health estimates 2014 summary tables: DALY by cause, age, and sex, 2000 2012 Geneva: World Health Organization; 2010.

31. World Health Organization. Injuries and violence: the facts. Geneva: World Health Organization; 2010.

32. Zheng DJ, Sur PJ, Ariokot MG, Juillard C, Ajiko MM, Dicker RA. Epidemiology of injured patients in rural Uganda: A prospective trauma registry's first 1000 days. PLoS One. 2021 Jan 22:16(1):e0245779 doi: 10.1371/journal.pone.0245779.

11. It is now clear, according to the study reports, that trauma centers are essential and ideal for cities, which is why the government introduced the scheme to establish these centers. However, there is a common misconception that the trauma center is meant to replace the orthopedic department of the GMC Hospital. Upon reviewing the records, it becomes clear that this approach is incorrect. The government's scheme was specifically approved for the maintenance and repair of the existing orthopedic department building, with plans to upgrade its equipment and meet the required criteria.

12. It is important to understand that a trauma center is not limited to just one department, like orthopedics. It also includes other specialties such as emergency medicine, surgery, and neurology. Therefore, instead of relocating the existing orthopedic department to the newly constructed building designated for the trauma center, it would be more effective to operate both: the trauma center in the new building and the orthopedic department in its current building, where the maintenance and repair scheme is already underway. This strategy ensures that both the orthopedic department and the trauma center meet the required standards while serving the growing population, and this approach would better serve the public, especially considering the high demand from the population.

13. The government's approved scheme involves renovating the old orthopedic department while simultaneously building a new trauma center, with the upgraded infrastructure and equipment needed for trauma care.

14. Furthermore, the **Shaheed Mohtarma Benazir Bhutto Institute of Trauma at Karachi Act, 2018,** under Section 11(1), clearly outlines the policy of the Institute, which is ruled by the government. According to this section, the Board established under the Act is required to operate in accordance with the policy provided by the Government. For ready refernce Section 11(1) reads as follows:

11(1). Government Guidelines. In discharging of its functions and duties, the Board shall be guided by the Policy in the light of any instructions given to it from time to time by the Government.

15. According to the Feasibility Study Report and guidelines issued by the Health Department of the Government of Sindh, the Shaheed Mohtarma Benazir

Bhutto Institute of Trauma (SMBB Institute of Trauma) is mandated to perform its functions in alignment with government policies. The government's actions to establish the trauma center under the SMBB Institute are fully covered by the statutory framework, as outlined in relevant policies, feasibility studies, and official communications. This ensures that the establishment and operation of the trauma center comply with the legal and regulatory guidelines set by the government.

16. In the present case, it is clear that the executive, in the public interest, has made the policy decision to establish a trauma center. The scheme for its establishment has been approved with the objective of serving the public. It is well settled that the formulation and implementation of policies fall within the exclusive domain of the Federal and Provincial Governments, who decide priorities and allocate resources based on public needs. In the present matter, the government introduced the scheme, and therefore, it falls squarely within its executive domain. Reliance is placed on **Watan Party and another vs. Federation of Pakistan and others, PLD 2013 Supreme Court 167,** where it was held that:

> *8. From the bare reading of the Constitution, particularly, Articles 29 and 38 of Chapter 2, Part-II, relating to principles of policy, it is evident that policies are to be made by the respective Federal and Provincial Governments and all decisions regarding their implementation are also to be taken by them on the basis of determined priorities of different projects and availability of financial resources at their disposal. Obviously, this exercise cannot be ordinarily interfered with by this Court by invoking its jurisdiction under Article 184(3) of the Constitution, unless shown to be mala fide or in violation of the fundamental rights guaranteed under the Constitution to every citizen of this Country, thereby affecting the interest of public at large.*

17. In addition, it is important to recognize that the domain of the executive in determining policies is not within the jurisdiction of the Courts, particularly in cases where the courts lack the technical expertise required to assess the matter. Executive policy-making is a prerogative of the executive, as established by the Constitution. Courts should not interfere in this domain unless there is a clear breach of fundamental rights or Constitutional mandates. Support for this position can be drawn from several cases: **Peshawar Electric Supply Company Ltd. (PESCO) and another vs. SS Polypropylene (Pvt.) Ltd., Peshawar and others, PLD 2023 Supreme Court 316, Messrs Sadiq Poultry (Pvt.) Ltd. vs. Government of Khyber Pakhtunkhwa through Chief Secretary and others, PLD 2023 Supreme Court 236,** and **Sikandar Ali and others vs. Province of Sindh through Secretary Education and Literacy Department, Sindh**

Secretariat, Karachi and others, 2023 PLC (C.S.) 566 [Sindh High Court-DB], where the Courts reiterated that policy-making belongs to the executive and not to the judiciary.

18. In the instant case, the petitioner's counsel contends that the orthopedic department should be shifted to the newly constructed building, while the trauma center may be established at a separate location with all necessary facilities. However, this argument reflects the viewpoint of the head of the orthopedic department rather than an objective assessment of public welfare. The government's established policy provides for the trauma center to be set up in the new building, while the existing orthopedic department is to be renovated under an ongoing approved scheme. The petitioners must demonstrate they are litigating in the public interest, not just in support of individuals, but for the welfare of the general public. In public interest litigation, the petitioners must show that their case concerns the broader public good and that they are challenging the failure of public functionaries to fulfill their legal duties in the interest of the people. Reliance can be placed on the case of **Javed Ibrahim Paracha vs. Federation of Pakistan and others, PLD 2004 Supreme Court 482**. Additionally, in the case of **Premier Battery Industries Private Limited vs. Karachi Water and Sewerage Board and others, 2018 SCMR 365**, as it was held that

> *13. In the present case, at the centre of the controversy is a built, own and operate project for uninterrupted supply of electricity to various pumping stations operated by KW&SB. Work towards the operation of these pumping stations has direct nexus with the supply of water to citizens of Karachi which has not progressed since March, 2017, when this litigation was initiated. While the Court is not inclined without evidence to impute any motives to the petitioner, we must emphasize that public interest litigation undertaken by a citizen must in the first place transparently demonstrate its complete bona fides; that such litigation is not being undertaken to serve a private or vested interest and is demonstrably aimed at serving public interest, good or welfare. These attributes in a public interest initiative have already been dilated upon by this Court in Muhammad Shafique Khan Sawati v. Federation of Pakistan (2015 SCMR 851); ECHO West International (Pvt.) Ltd. v. Government of Punjab (PLD 2009 Supreme Court 406); Iqbal Haider v. Capital Development Authority (PLD 2006 Supreme Court 394) and Javed Ibrahim Paracha v. Federation of Pakistan (PLD 2004 Supreme Court 482).*

19. Thus, keeping in view the foregoing reasons and discussions, this Constitutional Petition is hereby dismissed. It is pertinent to note that the Government is mandated to honor its commitments and facilitate the public by ensuring the timely establishment of the trauma center. The Government must

take stern steps to ensure the completion of the orthopedic department in its previous structure, as part of the renovation and maintenance scheme, in accordance with the approved plans. This is necessary to effectively serve the public and address the healthcare needs of society.

JUDGE

JUDGE