

Research Domains for Using Recorded Data in the National Trauma Registry

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Abstract

Introduction: Trauma-related deaths increase yearly. The distribution of trauma cases is increasing in middle- and low-income countries, and therefore, a national trauma registry system is needed. This study aimed to prioritize the research domains using the data recorded in the National Trauma Registry of Iran (NTRI).

Method: This study used three stages of qualitative and quantitative research methods. First, a detailed literature review was conducted to identify the research domains. Then, appropriate criteria for the priority setting of the study were determined. Finally, scientists and experts of the NTRI ranked the research areas. The data provided by NTRI experts were analyzed based on five scenarios.

Results: By literature search, 14 main domains using trauma registry data were identified, and six criteria were included in the final modeling phase to prioritize the mentioned domains. According to the NTRI expert opinion, the priority of criteria from highest to lowest was: "effectiveness of interventions performed on patients," "improving the quality of medical services," "prevention of trauma," "Improving economic indicators of the health sector," "feasibility," and "importance in science and knowledge production" respectively. Finally, using the multi-criteria decision-making (MCDM) model, "investigating trauma incidence in children and adolescents" and "investigating the relationship between trauma registry data and hospital care protocols" had the highest and lowest average scores, respectively.

Conclusion: The results of this study show that, based on the data recorded in NTRI and according to experts' views, "trauma incidence in children and adolescents, and distribution of trauma based on demographic information" were the most critical areas of research. A complete trauma registry system with an assessment of mentioned domains should be a priority for policymakers.

Keywords: Trauma; Disease registration; Research Priority Setting.

Introduction

Trauma causes many deaths every year. The Global Burden of Disease Study results for 2015 show that 4.7 million people died of trauma, more than half of whom were in low-income countries. This subject shows the need for a national trauma registry system ¹. Evidence shows that the distribution of trauma cases is increasing in middle- and low-

income countries, reaching 90% of the world's population ^{2,3}.

In 2009, the WHO published Guidelines for Trauma Quality Improvement Programs to strengthen the quality of trauma care. The efficiency of this kind of activity is optimal where there is access to trauma-specific data ⁴.

In Australia, establishing trauma systems reduced risk-adjusted mortality ⁵. People with a potentially

treatable injury are up to six times more likely to die in a country without an organized trauma system than in a country with an organized trauma system ⁶.

Trauma will be important among the topics related to health and health policy. In Iran, trauma is one of the most important causes of death. In 2010, trauma was recognized as the first cause of death in Iranians aged 15-49 from both sexes. Trauma refers to any event or incident resulting from acute exposure to direct or indirect external energy that exceeds the physiological tolerance threshold of the body. These injuries can be intentional, such as those caused by an assault, or unintentional, such as road accidents ^{7,8}.

A trauma registry is a specific data repository that documents trauma care's epidemiology, processes, and outcomes. Trauma registries, measuring the impact of injury and quality of care, have been a critical component of developed trauma systems for decades. They have been criticized for increasing quality improvement and showing the benefits, including mortality and disability reduction ^{4,9,10}. A registry is a collection of systematic information used for specific objectives, such as improving the quality of services and better decision-making ¹¹. In the United States, the development of the trauma registry coincided with the establishment of trauma registration centers in the 1970s. In 1982, "the American College of Surgeons Committee on Trauma" performed the first comprehensive study, the "Major Trauma Outcome Study." The most common information in the trauma registry is demographic information, cause of injury, clinical stages of diagnosis, length of hospital stay, and probability of death. The achievements of the trauma registry are evaluating and improving patient care, finding ways for injury prevention initiatives, documentation of the various socioeconomic effects of trauma, and research and development ¹². A trauma registry is a primary factor in improving trauma care. Hence, developing countries worldwide have tried to develop trauma systems; however, the level of local trauma registration activities is unclear ⁴.

A trauma registry can significantly reduce the risk of mortality and associated complications since it assesses the quality and is a framework for developing and evaluating injury prevention strategies and clinical guidelines. These registries help policymakers and physicians improve policy and provide healthcare for the affected patients. Researchers also believe that an

organized trauma registry is effective in reducing trauma-related deaths. Evaluation, improvement, and a desirable future in the trauma system need a comprehensive trauma information system ¹³. Reviewing related papers and webpages shows inequality in trauma registration activities between developed and less developed countries. The lack of trauma care information systems remains challenging for developing trauma systems worldwide ⁴. A trauma registry for policy-making could be helpful in various dimensions, like increasing patient care quality, preventing injuries, determining the details of socioeconomic status effects, and improving the quality of research in practical ways ¹⁴. Hence, the present study prioritized the research domains using the data recorded in the National Trauma Registry of Iran (NTRI) for better policymaking.

Methods

The trauma registry is recorded to improve the quality and evaluation of care for trauma patients. In Iran, the Sina Trauma and Surgery Research Center, affiliated with the Tehran University of Medical Sciences, has done trauma registration for the first time. The present study used qualitative and quantitative research methods in three steps. This research was performed in Tehran between 2020 to 2021.

Step 1: A systematic review of the domains for trauma data utilization

In the first step, a systematic review was conducted to scrutinize trauma registries worldwide by searching PubMed and EMBASE until July 2020.

The inclusion criteria for screening papers were as follows, "1. be extracted from data related to trauma registries; 2- be written in English; 3- define a period and a patient population; 4- preferably have more details and policy recommendations; and 5- preferably discuss how to improve diagnosis and treatment" ¹⁴. Duplicate articles, editorials, commentaries, and reviews were excluded. After screening titles and abstracts by two independent reviewers, the included studies underwent full-text reviews and data extraction.

Step 2: Determining the practical criteria of priority setting in health research, especially trauma research

In this step, to design a multi-criteria decision model, it was necessary to determine the criteria affecting health research priority setting, especially for trauma research. After the initial identification of the criteria

from the reviewed literature, a panel of five experts in the field of trauma (research and clinical experts) was formed to check the validity of the criteria and finalize them.

Step 3: Priority setting of the domains using the data recorded in trauma registries

In this step, two following sub-steps of screening were taken. The panelists at this stage included experts, professors, and researchers involved in trauma data registration (NTRI). Ten experts were selected based on the study's scope and the participants' availability.

Step 3-1

First, research domains were examined only based on the "technical / implementation feasibility" criterion. Domains that passed this initial screening were then prioritized using other criteria simultaneously.

Steps 3-2

Research domains in which technical implementation feasibility was agreed upon by at least 75% of the experts entered the final phase of priority setting. Next, for each obtained criterion, 1-5 scoring scales were defined and provided to the experts to express their opinions based on the designed scales.

Delphi technique was performed for up to two rounds. The data collection tool in the first round of Delphi was based on reviewing the studies in the previous stages. In the second round of Delphi, the data collection tool was a researcher-made questionnaire that examined the extent to which experts agreed on the domains presented in the first round. The designed questionnaire addressing the existing domains of trauma registry data utilization based on a five-point scoring scale was distributed among the research population. According to this scale, score one meant low agreement, and five meant high agreement on the domains. The questionnaire was sent to individuals via email or social media applications. The scores assigned to each of the research domains were divided into three categories: low agreement (1), moderate agreement (2-4), and high agreement (5). Research domains with which more than 50% of respondents strongly agreed (5) were included in the framework as final domains.

The final priority setting of research domains was done via applied multi-criteria decision-making (MCDM), a quantitative approach that used applied mathematics to design a priority-setting framework. It refers to "making preference decisions by evaluating

and prioritizing a limited set of alternatives based on multiple conflicts attributes" ¹⁵.

Results

In the second stage, a search for related studies was initiated to determine and finalize the criteria for priority setting of the obtained data utilization domains of the NTRI. According to this search, no similar study was found to have used this trauma model. For this reason, we sought other studies related to health research priority setting to identify the criteria. In this study, two discrete search strategies were used:

Search strategy for PubMed database:

(((((trauma) OR (trauma) [MeSH Terms])) OR ((injury) OR (injury [MeSH Terms])))) AND ((registry) OR (registry [MeSH Terms])) AND (Research) / 7961

Search strategy for EMBASE database:

('trauma' / exp OR trauma OR 'injury' / exp OR injury) AND ('registry' / exp OR registry OR record) AND research AND [article] / 11596

After screening the studies based on the inclusion criteria and quality assessment, fourteen main research domains (from 30 included studies) were extracted in terms of research priority setting (Figure 1) (Table 1).

The domains of "Investigating the relationship between trauma registry data and hospital care protocols (in terms of measuring the quality of care and outcomes)" and "Determining the causes of DALYs due to trauma" had the highest frequency based on retrieved papers (Table 2).

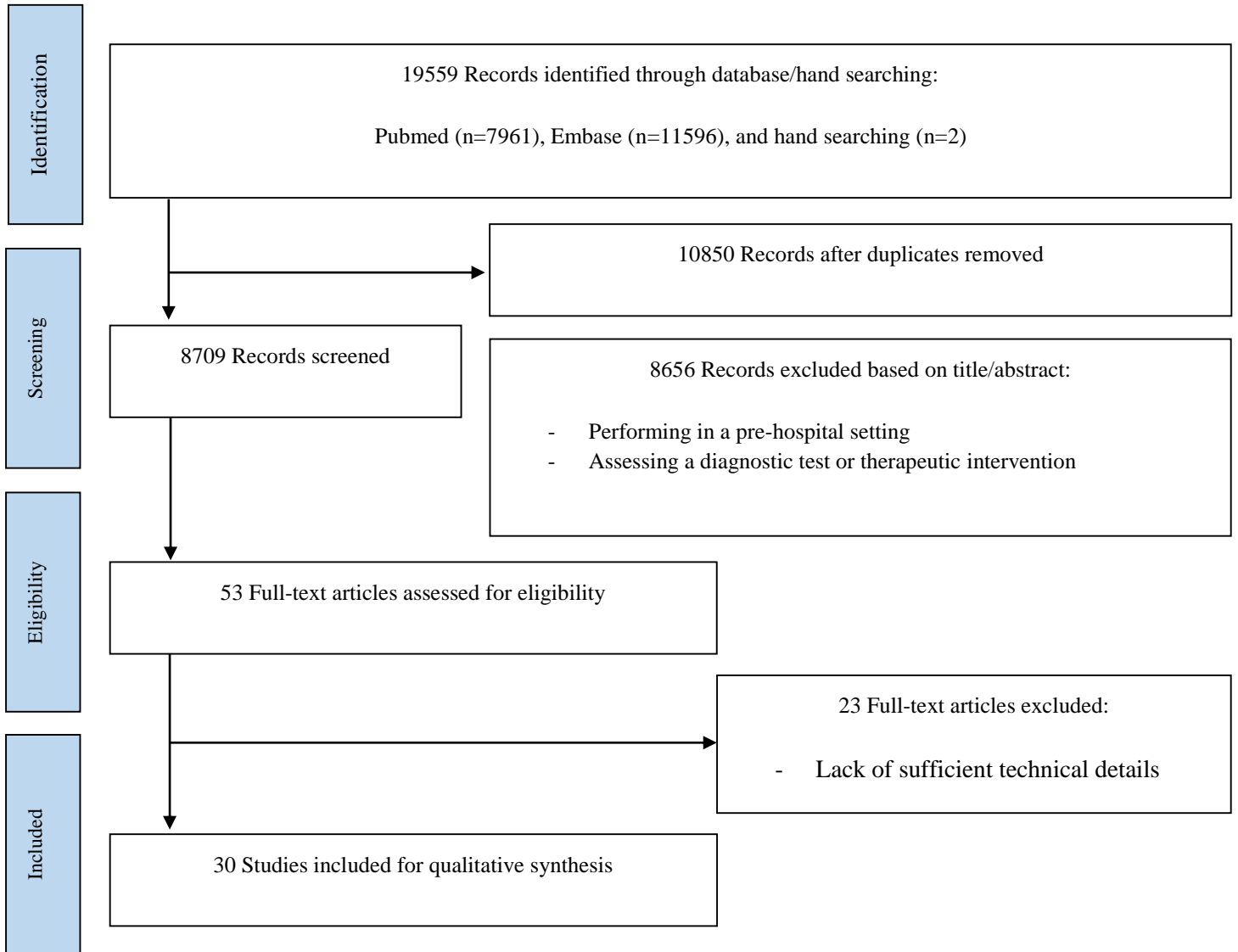


Figure 1: The flow-chart of study

Table 1: A summary of extracted data from included studies

No.	Basic characteristics of the studies		Criteria for quality appraisal of the articles			
	Title	Publication Date	Is the purpose of the study carefully stated?	Is the study design in line with the purpose of the study?	Have the consequences and results of the study been carefully examined?	Are the practical and operational points of the study stated?
1	Epidemiology of severe trauma(16)	2014	Not Clear	Not Clear	Yes	Yes
2	Bicycle-Related Injuries in Pediatric Patients(17)	2018	Yes	Yes	Yes	Not Clear
3	The Australian Trauma Registry(18)	2018	Not Clear	Yes	Yes	Not Clear
4	Gun trauma and ophthalmic outcomes(19)	2018	Yes	Yes	Yes	Yes
5	Correlation between field triage criteria and the injury severity score of trauma patients in a French inclusive regional trauma system(20)	2019	Yes	Yes	Yes	Not Clear
6	The number of displaced rib fractures is more predictive for complications in chest trauma patients(21)	2017	Not Clear	Yes	Yes	Not Clear
7	The price of personal mobility: burden of injury and mortality from personal mobility devices in Singapore - a nationwide cohort study(22)	2019	Yes	Yes	Yes	Not Clear
8	Is there an association between female gender and outcome in severe trauma? A multi-center analysis in the Netherlands(23)	2019	Yes	Yes	Yes	Yes
9	A prospective stepped wedge cohort evaluation of the new national trauma team activation criteria in Sweden – the TRAUMALERT study(24)	2019	Yes	Yes	Yes	Yes
10	Penetrating Colon Trauma Outcomes in black and white males(25)	2018	Yes	Yes	Yes	Yes
11	Strategies for successful trauma registry implementation in low- and middle-income countries—protocol for a systematic review(26)	2018	Yes	Yes	Yes	Not Clear
12	Injury coding in a national trauma registry: a one-year validation audit in a level 1 trauma center(27)	2019	Yes	Yes	Yes	Not Clear
13	The spectrum and outcome of blunt trauma related enteric hollow visceral injury(28)	2018	Not Clear	Yes	Yes	Yes
14	Evaluation of trauma registry data in Asir region(29)	2001	Yes	Not Clear	Yes	Yes
15	Presenting an evaluation model of the trauma registry software(30)	2018	Yes	Yes	Yes	Yes
16	Trauma registry implementation in low- and middle-income countries: challenges and opportunities(31)	2018	Yes	Yes	Yes	Yes
17	Developing Australia's first statewide trauma registry: What are the lessons?(32)	2004	Yes	Not Clear	Yes	Yes
18	Pediatric disaster preparedness: The potential role of the trauma registry(1)	2009	Yes	Yes	Not Clear	Yes
19	Trauma registry data validation: Essential for quality trauma care(33)	2006	Yes	Not Clear	Yes	Yes
20	Systematic review of trauma system effectiveness based on registry comparisons(34)	1999	Yes	Not Clear	Yes	Yes
21	Trauma registries: What is the experience in developing countries?(35)	2013	Yes	Yes	Yes	Not Clear

22	Global trauma registry mapping: A scoping review(4)	2012	Yes	Yes	Yes	Yes
23	Trauma Registries: History, Logistics, Limitations, and Contributions to Emergency Medicine Research(12)	2011	Yes	Not Clear	Yes	Not Clear
24	State Trauma Registries as a Resource for Occupational Injury Surveillance and Research: Lessons From Washington State, 1998-2009(36)	2016	Yes	Yes	Yes	Yes
25	Trauma Surveillance and Registry Development in Mozambique: Results of a 1-Year Study and the First Phase of National Implementation(37)	2019	Yes	Yes	Yes	Yes
26	Trauma registry comparison: six-year results in trauma care in Southern Finland and Germany(38)	2014	Yes	Yes	Yes	Not Clear
27	Developing a low budget trauma registry(39)	2019	Yes	Not Clear	Yes	Not Clear
28	Canadian Benchmarks in Trauma(40)	2007	Yes	Yes	Yes	Yes
29	Exploring data sources for road traffic injury in Cameroon: Collection and completeness of police records, newspaper reports, and a hospital trauma registry(41)	2017	Yes	Yes	Yes	Yes
30	Routine follow up of major trauma patients from trauma registries: What are the outcomes? (42)	2006	Yes	Yes	Yes	Not Clear

Table 2: The domains extracted from studies and their frequency.

No.	Domains	Frequency
1	Investigating the relationship between trauma registry data and hospital care protocols (in terms of measuring the quality of care and outcomes)	8
2	Determining the causes of DALYs due to trauma	5
3	Carrying out economic evaluations as well as measuring the effectiveness of the establishment of a national trauma registry program in the country for a comprehensive evaluation of this program	3
4	Investigating trauma incidence in children and adolescents	2
5	Investigating how triage checklists for trauma patients are periodically reviewed to optimize the patient care process and improve the quality of services provided	2
6	Assessing the degree of injury to trauma patients using injury severity scales	2
7	Estimation of the burden of trauma and determining its risk factors	2
8	Calculation of DALYs due to trauma	1
9	Incidence of trauma (Based on Income Status)	1
10	Investigating the distribution of trauma events based on gender	1
11	Investigating trauma incidence based on the classification of motor and non-motor vehicles	1
12	Investigating the distribution of trauma incidence based on demographic information	1
13	How trauma codes are constantly reviewed?	1
14	Assessing the mortality rate in the provinces participating in the trauma registry network	1

After the initial extraction of these criteria from the reviewed studies, their face validity was evaluated by the authors and members of the research team. Then those criteria that were not relevant to the objectives of this study were removed. After counting and initially identifying the criteria in the reviewed texts, a panel of five experts in the field of trauma was formed to check the validity of the selected criteria and finalize them for shaping the priority-setting model. Finally, six criteria were included in the final modeling phase, which is described below:

1. Technical / implementation feasibility: How complex is the implementation of this research domain in terms of 5 dimensions: software and hardware capacities (i.e., the capacity of the existing health information system to collect data needed to implement this area), financial and human resources, main priorities of the health system, the commitment of senior management, and level of coordination of administrative processes?

2. Importance in knowledge and science production: What is the impact of implementing this domain of research on increasing the quantity and quality of science production in the field of trauma (e.g., publishing articles and seminal books in the field of trauma in reputable international journals and publishers, high citations, and improving the country's scientometrics indicators in the field of trauma)?

3. Improving the quality of medical services: Can the implementation of this domain of research produce evidence based on which managers and policymakers can improve the quality of services provided to trauma patients in medical centers (e.g., the speed and accuracy of the triage process, medical error rate, readmission rates, etc.)?

4. Effectiveness of interventions performed on patients in medical centers: To what extent can the evidence obtained from the implementation of this field of research help reduce the complications and disability caused by trauma, improve the quality of life, and reduce the mortality of trauma patients?

5. Improving economic indicators of the health sector: To what extent the evidence obtained from the implementation of this field of research can help to improve the economic indicators of the health sector (e.g., the cost of care provided to patients, the total cost of the health system, and economic efficiency)?

6. Prevention of trauma: To what extent will the evidence obtained from the implementation of this field of research affect the measures related to the prevention of trauma accidents and reduce the rate of trauma?

As mentioned in the method section, two screening steps were taken in the second prioritization stage. First, research domains were examined only based on the "technical / implementation feasibility" criterion. Domains that underwent initial screening were then prioritized simultaneously based on other criteria. In the following, we present the results of this step.

A) Assessment of research domains based on the "technical / implementation feasibility" criterion

To assess the research domains based on the technical and implementation feasibility criterion, the validity of this criterion was first evaluated, and then the opinions of experts were collected and analyzed based on it:

A-1) Validity Evaluation

The validity of the technical / implementation feasibility criterion was evaluated as follows: First, based on the reviewed texts, 14 research domains were identified, which were examined in a panel held in a virtual space with the presence of 6 experts in the field of trauma to evaluate the initial face validity. Finally, based on the face validity obtained, 13 domains remained out of the initial 14 research domains (Table 3).

In the next step, the degree of relevance of each of these 13 domains to the current situation of the NTRI was discussed by the same five experts, and based on the cutoff point of 75% agreement, four domains were eliminated. Finally, nine domains have entered the technical / implementation feasibility assessment phase.

Table 3: Scores of the validity of the technical / implementation feasibility criterion

Research Domains	Total score	Rank
Estimation the burden of trauma	0.911	1
Assessing the degree of injury to trauma patients using injury severity scales	0.900	2
Calculating DALYs	0.836	3
Calculating trauma risk factors	0.830	4
Investigating trauma incidence based on the classification of motor and non-motor vehicles	0.827	5
Investigating trauma incidence in children and adolescents	0.782	6
Investigating the distribution of trauma incidence based on demographic information	0.773	7
Designing the process of continuous review of trauma codes to find the missing and required codes	0.771	8
Investigating the relationship between trauma registry data and hospital care protocols (in terms of measuring the quality of care and outcomes)	0.755	9
Carrying out economic evaluations as well as measuring the effectiveness of the establishment of a national trauma registry program in the country for a comprehensive evaluation of this program	0.723	10
Determining how to add new partner centers to the NTRI (demographic and geographical context, economic budget and manpower status)	0.651	11
Comparing the mortality rate in areas participating vs. not participating in the NTRI (starting from 2015 when the NTRI was launched to November 2020 when this study was conducted)	0.642	12
Investigating how triage checklists for trauma patients are periodically reviewed to optimize the patient care process and improve the quality of services provided	0.481	13

A-2) Surveying experts on technical / implementation feasibility

At this stage, 14 representatives of the centers participating in the NTRI were surveyed, and 10 completed the questionnaire. First, the technical and implementation feasibility was defined in 5 domains, including *) software and hardware capacity related to the information network, *) financial-human resources, *) main priorities of the health system, *) a commitment of senior management and *) level of coordination of implementation processes.

Then the weights of this area were obtained from experts, and finally, based on the value of each research model in each field, priority setting was conducted based on a simple additive weighting (SAW) model. The calculated weights were as follows, 0.159, 0.238, 0.224, 0.193, and 0.182 for “level of coordination of implementation processes,” “commitment of senior management,” “main priorities of the health system,” “financial-human resources and software and hardware capacity concerning the information network. Considering a cut-off point of 75%, one of the domains did not meet the cut-off point and was removed. Finally, we reached eight research domains for the final priority setting (Table 4).

Table 4: Final priority setting based on technical / implementation feasibility criterion

Research Domains	Total score	Rank
Determining the causes of trauma	0.967	1
Investigating trauma incidence based on the classification of motor and non-motor vehicles	0.933	2
Designing the process of continuous review of trauma codes to find the missing and required codes	0.931	3
Assessing the degree of injury to trauma patients using injury severity scales	0.916	4
Investigating distribution of trauma incidence based on demographic information	0.892	5
Calculating the rate of trauma deaths	0.859	6
Investigating trauma incidence in children and adolescents	0.800	7
Investigating the relationship between trauma registry data and hospital care protocols (in terms of measuring the quality of care and outcomes)	0.755	8

B) Final priority setting based on 6 criteria

In this stage, i.e., the final priority setting of research domains based on the last six criteria, the remaining eight domains, which were feasible from the experts' perspective regarding technical and implementation factors, were entered into the final mathematical modeling. Based on their value in terms of the six criteria (i.e., technical / implementation feasibility, importance in knowledge and science production, improving the quality of medical services, the effectiveness of interventions performed on patients in medical centers, improving economic indicators of the health system, and prevention of trauma) were evaluated by experts involved in the NTRI. After obtaining the experts' opinions, the domains were finally prioritized. Based on the weights obtained, the highest weight of the criteria was allocated by the experts to the following criteria: "effectiveness of interventions performed on patients in medical centers" (0.192), "improving the quality of medical services" (0.186), "prevention of trauma" (0.184), "Improving economic indicators of the health sector" (0.159), feasibility (0.145), and "importance in science and knowledge production" (0.134) (Table 5).

C) Sensitivity analysis

In this sensitivity analysis (to determine how the criteria values' changes will impact the final research priority setting), the two previous criteria (i.e., technical / implementation feasibility and importance in science and knowledge production) are considered. In the meantime, four criteria (i.e., the level of quality of services provided, the effectiveness of interventions on patients, improving economic indicators of the health system, and trauma prevention) were merged, and a new criterion was defined as "the level of importance for the health system" (Table 6). After that, five scenarios were defined, and priority setting was done (Table 7).

ü Scenario 1) priority setting of research domains based on three criteria (taking into account the weights assigned by experts)

ü Scenario 2) priority setting of research domains based on three criteria (assuming equal weights)

ü Scenario 3) priority setting of research domains based on three criteria (taking into account the weights in different sub-scenarios):

1. Weights: Feasibility (0.5), Level of importance for the health system (0.25), Importance in science and knowledge production (0.25)
2. Weights: Feasibility (0.5), Level of importance for the health system (0.25), Importance in science and knowledge production (0.25)
3. Weights: importance in science and knowledge production (0.25).

Scenario 4) priority setting of research domains based on considering "the importance in knowledge and science production" as the sole criteria

ü Scenario 5) priority setting of research domains based on considering "the level of importance for the health system" as the sole criteria

Table 5: Average scores assigned by experts to each research domains according to the criteria (scores are between 1 and 5).

Research Domains	Feasibility	Importance in knowledge and science production	Improving the quality of medical services	The effectiveness of interventions performed on patients in medical centers	Improving economic indicators of the health system	Prevention of trauma	Rank
Investigating trauma incidence in children and adolescents	3.875	4.5	4.25	4.125	3.375	4.375	1
Investigating the distribution of trauma incidence based on demographic information	4.25	4.375	3.375	3.375	3.375	4.5	2
Determining the causes of trauma	3.5	4.125	3.375	3.25	3.5	4.125	3
Investigating trauma incidence based on the classification of motor and non-motor vehicles	4	3.875	3.125	3.25	3.125	4.125	4
Designing a process for continuous review of trauma codes to find missing and required codes	3.625	4.25	3.375	3.125	3.375	3.5	5
Calculating the rate of trauma deaths	3.625	4.125	2.875	2.875	3.75	4	6
Assessing the degree of injury to trauma patients using injury severity scales	3	4.5	3.625	3.125	3.125	3.5	7
Investigating the relationship between trauma registry data and hospital care protocols (in terms of measuring the quality of care and outcomes)	2.625	3.5	3.875	3.625	3.75	2.875	8

Table 6: Different weights in various scenarios.

Criteria	Scenarios						
	1	2	3a	3b	3c	4	5
Level of importance for the health system	0.72	0.33	0.25	0.25	0.5	0	1
Importance in science and knowledge production	0.14	0.33	0.25	0.5	0.25	1	0
Feasibility	0.14	0.33	0.5	0.25	0.25	0	0

Table 7: Different research domains ranking in various scenarios.

Research Domains	Scenarios Ranking						
	1	2	3a	3b	3c	4	5
Investigating trauma incidence in children and adolescents	1	1	2	1	1	1	1
Investigating the distribution of trauma incidence based on demographic information	2	2	1	2	2	3	3
Investigating trauma incidence based on the classification of motor and non-motor vehicles	3	3	3	7	4	7	5
Determining the causes of trauma	4	4	6	4	3	5	4
Calculating the rate of trauma deaths	5	5	5	6	5	5	6
Designing the process of continuous review of trauma codes to find the missing and required codes	6	6	4	3	6	4	8
Assessing the degree of injury to trauma patients using injury severity scales	7	7	7	5	7	1	7
Investigating the relationship between trauma registry data and hospital care protocols (in terms of assessing the quality of care and outcomes)	8	8	8	8	8	8	2

Discussion

Based on the results of this research, the following priority-setting criteria were obtained the highest to lowest weights, respectively, which the experts of the NTRI assigned:

- “Effectiveness of interventions performed on patients”
- “improving the quality of medical services,” “preventing trauma.”
- improving economic indicators of the health system.”
- “feasibility”
- “importance in science and knowledge production”

Using a trauma registry to improve clinical effectiveness and quality of care in developed countries had difference from developing context, and in the former, it is more effective; in low- and middle-income countries, the death rate from trauma is high, which is due to two reasons: violation of traffic laws and lack of a pre-hospital trauma registry system for prevention. Therefore, the first step is to prepare and design a national trauma registry system⁹. As a whole, the studies emphasized that outcomes like effectiveness and quality other than mortality in trauma registry for prioritizing research projects where the resources are worth can be considered to guide the providers^{4, 10, 43}. The results showed that improving economic indicators of the health system should be considered in prioritizing trauma domains. In many countries, maintaining the desired quality is one of the fundamental pillars in their health system outlook, but recording and using the information output of trauma patients to calculate costs and

allocate resources is essential. These cost reports can be valuable sources of information for payers. The recorded information includes demographic information, the injury and its severity, pre-hospital care, etc. Estimates suggest a cost of \$ 100-140 per patient record in the range of 500-700 patients per year³².

Looking across the mean values given to each of the research domains by the experts of the NTRI, it can be argued that according to the current structure of the NTRI, the selected domains, which are relatively feasible, have at the same time a very high impact on other criteria such as “the effectiveness of interventions on patients,” “improving the quality of medical services,” “prevention of trauma,” “improving economic indicators of the health system,” and “importance in knowledge and science production.” For example, according to the experts’ view, in addition to its feasibility in the current structure of the NTRI, the area of “Investigating trauma incidence in children and adolescents,” which was ranked first in most scenarios, has a relatively significant impact on criteria such as “trauma prevention,” “improving the quality of medical services,” “importance in science and knowledge production,” and “effectiveness of interventions for patients.”

Also, considering each criterion alone, in terms of importance in science and knowledge production, “assessing the degree of injury to trauma patients using injury severity scales” has the highest priority. In contrast, in terms of “importance for the health system,” the area of “investigating trauma incidence in children and adolescents” has the highest priority.

Moore et al. also showed that trauma registry provides valuable information concerning the epidemiology of injuries, which effectively improves the quality of services; O'Reilly et al. declared that research about trauma systems and the quality of trauma care could affect the level of the burden of injuries. The effect of implementing a research model on trauma epidemiology and resources in that field was the main issue that was discussed by Ehteram and Sharif-Alhoseini⁴⁴.

As trauma is a cause of death or disability that varies across regions, and affects the quality of life of people, a wide range of data production methods, including data from health centers, household surveys, censuses, vital records, national health accounts, and trauma registries try to record the information about trauma patients. However, using this information to reduce trauma events and improve the quality of care requires a systematic structure based on the conducted research. This can help policy-making and estimate the disease burden¹⁶.

Conclusion

Based on the data recorded in NTRI and according to experts' views, "trauma incidence in children and adolescents and also distribution of trauma incidence based on demographic information" are the most important areas of research, although the requirement of performing those needs to implement a perfect trauma registry system however research on the mentioned domains should be a priority for policymakers.

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Conflict of Interest Disclosures

The authors declare that they have no conflict of interests.

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Authors' Contributions

MRM and MSH contributed to the design, data collection, drafting, and supervision.

KZ contributed to the design, data analysis, and overall supervision. FH, MM, FZ, EM, and AO contributed to the design, data analysis, and drafting. All authors read and approved the final manuscript.

Ethical Statement

This research was confirmed by the ethics committee of Sina Trauma and Surgery Research Centre, Tehran University of Medical Sciences, Tehran, Iran, with The ethics code: 99-01-93-390.

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