Chinese Journal of Traumatology 23 (2020) 274–279

Contents lists available at ScienceDirect

Chinese Journal of Traumatology

journal homepage: http://www.elsevier.com/locate/CJTEE

Original Article

Using modified Delphi method to propose and validate the components of a child injury surveillance system for Iran

Tania Azadi [a], Farahnaz Sadoughi [b,*], Davoud Khorasani-Zavareh [c]

[a] Health Information Management Department, School of Health Management and Information Sciences, Iran University of Medical Sciences, Tehran, Iran
[b] Health Management and Economics Research Center, School of Health Management and Information Sciences, Iran University of Medical Sciences, Tehran, Iran
[c] Safety Promotion and Injury Prevention Research Center, Health in Disaster and Emergency Department, School of Health, Safety and Environment, Shahid Beheshti University of Medical Sciences, Tehran, Iran

ARTICLE INFO

Article history:
Received 30 December 2019
Received in revised form
15 July 2020
Accepted 1 August 2020
Available online 22 August 2020

Keywords:
Child
Wounds and injuries
Injury surveillance system
Modified Delphi method

ABSTRACT

Purpose: Child injuries are a public health concern globally. Injury surveillance systems (ISSs) have beneficial impact on child injury prevention. There is a need for evidence-based consensus on frameworks to establish child ISSs. This research aims to investigate the key components of a child ISS for Iran and to propose a framework for implementation.

Methods: Data were gathered through interview with experts using unstructured questions from January 2017 to December 2018 to identify child ISS functional components. Qualitative data were analyzed using content analysis method. Then, modified Delphi method was used to validate the functional components. Based on the outcomes of the content analysis, a questionnaire with closed questions was developed and presented to a group of experts. Consensus was achieved in two rounds.

Results: In round I, 117 items reached consensus. In round II, 5 items reached consensus and were incorporated into final framework. Consensus was reached for 122 items comprising the final framework and representing 7 key components: goals of the system, data sources, data set, coalition of stakeholders, data collection, data analysis and data distribution. Each component consisted of several sub-components and respective elements.

Conclusion: This agreed framework will assist in standardizing data collection, analysis and distribution, which help to detect child injury problems and provide evidence for preventive measures.

Introduction

Child injuries are an increasing global public health problem. Unintentional injuries of children aged 1–18 years old are the major cause of death and hospitalization worldwide with the likelihood of lifetime disabilities.[1] Intentional and unintentional injuries count for mortality of hundreds of thousands of children and disability of million more globally.[2] More than 95% of all fatal injuries in children occur in low and middle income countries (LMICs) where the magnitude of the problem is bigger and injury data are more often missing, and moreover of less quality or available very little.[3]

In Iran, with recent advances in providing timely and quality healthcare services to citizens, disease patterns have transited from communicable disease to non-communicable disease and injuries. Iran has a high global rank in terms of road traffic mortality rate (the fifth rank) and also has the highest mortality rate in the Eastern Mediterranean region.[4] Iran has a population of more than 80 million, among which 32% are younger than 19 years of age.[5] On average, 20.2% of death in children less than 5 years old occurs because of unintentional injuries in Iran.[6] According to the results of a national injury registry, burn injuries account for 58.8% of injuries among children under 7 years old.[7] Also, injuries are the most important cause of mortality in 1-to-14 year-old children.[8]

Injuries are preventable and the first step to prevent injuries is to know the extent and magnitude of the problem.[2,9] Injury surveillance systems (ISSs) through ongoing systematic data collection, analysis, interpretation and dissemination help to identify the injury patterns and the magnitude of the problem, as well as to provide necessary data for health policy makers to decide on preventive measures.[2,10]

Despite that different studies have evaluated the usefulness of ISSs in providing data about injury trend and identifying high risk groups for prevention programs,[11–16] not so many countries have

* Corresponding author.
E-mail address: sadoughi.f@iums.ac.ir (F. Sadoughi).
Peer review under responsibility of Chinese Medical Association.

https://doi.org/10.1016/j.cjtee.2020.08.007

established formal ISSs due to different obstacles.[2] Various obstacles have been identified in Iran including lack of political commitment, limitation in resources, and poor data collection and management procedures.[17] These have made ISSs mostly implemented in a number of high income countries. But, in LMICs where the magnitude of the problem is larger, no formal data collection mechanism usually exists for child injury surveillance.

Although various studies have been conducted in the field of child injuries and prevention in Iran, the majority of them are limited to epidemiologic studies[18–25] and less have addressed the problem from a surveillance-based point of view. There is lack of evidence in the body of knowledge in terms of ISS framework with respect to its key functional components. Examining the functional components of child ISS is useful as it could contribute to a standard collection procedure of more high-quality injury data. Thus, the aim of this study was to first identify and second validate the key functional components of a framework for child ISS in Iran using interviews and the modified Delphi method respectively.

Methods

This research was carried out from January 2017 to December 2018 and involved two tandem steps: (1) to identify and collect child ISS components through interviews with experts; (2) to validate the chosen components using the modified Delphi method. Panelists of the modified Delphi method were faculty members or researchers holding a PhD degree or a medical specialist with established career in the field of child injury prevention, injury surveillance, health information management or medical informatics with at least 10 years of working experience in the field. Panelists had expertise in using injury surveillance or registry systems. Ethics approval for this study was provided by the Ethics Committee of Iran University of Medical Sciences.

Identification of child ISS functional components

An interview guide with unstructured questions was used to identify the key components for child ISS. Participants were asked to express their opinion about key components of an ISS which is used to collect injury data in children in Iran. Snowball sampling technique was applied to identify experts, and interviews continued until data saturation was achieved. Fourteen experts in different fields of epidemiology, pediatrics, social medicine, safety promotion and injury prevention and health information management were interviewed. Written informed consents to participate in this research as well as to record the interviews were attained in the beginning of each interview session after instructions were given to the participants.

Recorded interviews were transcribed verbatim. Data were analyzed using content analysis method. Transcriptions were reviewed by the main researcher and open coding for the smallest possible meaning unit took place. Codes were revised and classified in some selected groups and subgroups based on their similarities and differences. All codes were revised by one of the team members with experience and expertise in qualitative research.

Validation of child ISS functional components

The modified Delphi technique was adopted in this step. Based on the outcomes of the content analysis, a questionnaire with closed questions was developed for a group of experts.[26] Although it is adequate to consider 5–10 experts for content validation,[27] 16 experts participated as the expert panel in round I and round II respectively, which consisted of the same 14 experts who previously had participated in the interviews plus 2 additional new members.

The questionnaire was subjected to scrutiny and was pilot tested by a sample of 5 well-experienced experts in the field of injury prevention and control. Items were rated on a scale of 4 = very important, 3 = important, 2 = moderately important, 1 = less important, and 0 = unimportant. The questionnaire included 151 elements which were divided into 7 major components and some subcomponents as well. Appendix 1 describes the structure of the questionnaire.

In round I, 151 items organized in 7 key functional components were distributed to the panel. Panel members were asked to rate the relative importance of individual items and also make changes to the phrasing of the items. A similar method was applied for voting in round II. The research goal was to obtain consensus regarding what functional components and their respective elements (items) are important for establishing a child ISS in Iran. Round I presented a questionnaire to panel members who completed and returned it to the researcher. The responses were analyzed and compiled to build round II questionnaire. The panelists of round II were the same with round I.

Frequencies, percentages, interquartile ranges and median scores were calculated to determine the degree of agreement for each item. Items were accepted if they acquired more than 75% of collective consensus of 4 (very important) and 3 (important). Collective consensus of items less than 50% or between 50% and 75% were removed and were sent for the next round respectively.

Results

ISS component development

The 14 experts in different fields of epidemiology, pediatrics, etc. as mentioned above were interviewed. The content analysis showed 151 elements (items) which were categorized in 7 major categories including goal of the system, data sources, data set, coalition of stakeholders, data collection, data analysis and interpretation, and data use. Among them, 5 categories comprised various subcomponents, i.e. data set, coalition of stakeholders, data collection, data analysis and interpretation, and data distribution. Appendix 2 illustrates the 7 major categories (components) of child ISS and its respective elements.

Modified Delphi round I

After round 1 voting was completed and comments have been summarized, redundant statements and statements sharing similar constructs were grouped and reduced. Specifically, 18 of 151 initial statements were combined and reduced to produce 9 statements that reached consensus, and were accepted for the final framework. For example, the following two items were originally included in the list of statements for round I (goals of the system): (1) to provide epidemiologic patterns of fatal injuries; and (2) to provide epidemiologic patterns of nonfatal injuries. All the two items received consensus (≥75% of respondents rated important or very important response (score 3 or 4) on the Likert scale for the element) were combined into a single statement to reduce redundancy, and accepted for the final framework. The revised element now reads “to provide epidemiologic patterns of fatal and nonfatal injuries.” Among the 151 initial elements, 108 were not deemed redundant, reached consensus, and thus were accepted into the final child ISS framework without modification. In total, 117 elements from round I were accepted into the final framework.

Round I was also used to generate 18 new elements by the panelists. New elements were categorized into the following components: data sources, data set, coalition of stakeholders, and data distribution. Also, 25 out of 151 initial statements did not reach consensus after round I. Totally, 43 elements were sent to round II.

Fig. 1 illustrates the results of the modified Delphi process based on recommendation made for modified Delphi method made by Eubank et al.[28] Appendix 3 shows an example of collective consensus analysis for the "goal" component of child ISS.

Modified Delphi round II

In this round, 5 of 43 elements reached consensus and were accepted without modification (≥75% of respondents rated important/very important response (3 or 4) on the Likert scale for the element), and were accepted into the final child ISS framework. The rest 38 failed elements were omitted from the final framework. As a result, the final child ISS framework consisted of 7 major components and 122 elements: 4 related to goals, 8 to data sources, 32 to data set, 15 to coalition of stakeholders, 9 to data collection, 19 to data analysis and interpretation, and 36 to data distribution (Table 1).

Discussion

To the best of our knowledge, this is the first use and reporting of modified Delphi method to develop a framework for child ISS in Iran healthcare setting. Child injuries are a worldwide public health concern requiring urgent attention. On this special population, application of ISS seems to be potentially beneficial.[17,29] In some cases in LMICs, data pertinent to child injuries and violence are weakly gathered; in other cases the collected data are of low quality and/or is scattered between different organizations with less opportunities for access and linkage.[2] Thus, there is a need for evidence-based consensus on frameworks to establish a child ISS for improving ISS where there is agreement.

Although there are plenty of research in the field of child injuries in Iran, no research about establishing an ISS for children were found. Only WHO guideline to establish ISSs was identified through literature search.[15] Therefore, this study implored the use of a modified Delphi method to develop a framework for establishing a child ISS in Iran. A detailed description of the Delphi method was included in this study to improve the quality of the final consensus framework and to add a level of credibility to the component development and selection process.[30]

In agreement with the literature, this framework recommends that goal of such system not only should provide the epidemiology pattern of child injuries but more importantly provide adequate supporting data to help in designing injury interventions and surveillance purposes,[15,31] a component which lacks in most current data collections in Iran. This goal is possible through considering variables in injury data set which help gather necessary information about child injury risk factors.[17] Variables proposed in data set

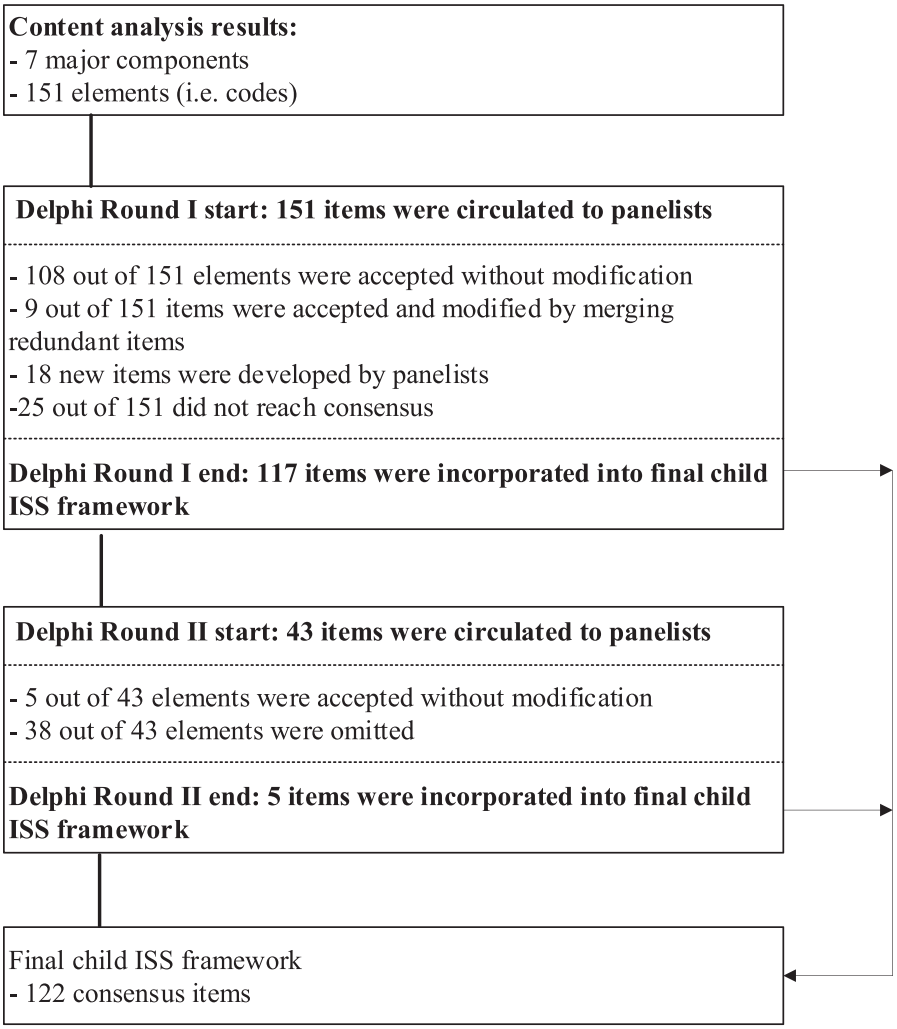

Fig. 1. Modified Delphi process and the results of each round.

Table 1
Child ISS framework comprising 7 major components and 122 elements.

Goals	
(1) To support injury prevention acts (2) To provide epidemiologic patterns of fatal and nonfatal injuries (3) To analyze fatal and nonfatal injury mechanism (4) To analyze fatal and nonfatal injury nature	
Data sources	
(1) Prehospital emergency (2) Emergency department of general and specialized hospitals with the priority of children hospitals (3) National death registry (4) 1–59 month children death surveillance (5) Police (6) Forensic medicine (7) Fire department (8) Red crescent	
Data set	
Identifiers	(1) National ID number, (2) date of creation of the record, (3) hospital name
Demographics	(4) Name, (5) date of birth, (6) gender, (7) address of residence place, (8) postal code
Time of injury related data	(9) Date of injury/death, (10) time of injury/death, (11) date of visit, (12) time of visit, (13) date of examination by a doctor, (14) time of examination by a doctor
Place of injury related data	(15) Injury place (home, outside of home, road traffic injury, work, other, unknown), (16) if home the exact place in home, (17) if outside of home the exact place, (18) if RTI the exact place, (19) if work the exact place, (20) postal address of injury place
Injury characteristics	(21) Body part, (22) external cause based on international classification of disease-10 (ICD-10), (23) injury nature based on ICD-10, (24) injury severity, (25) patients' outcome, (26) injury description (a free text field to describe what went wrong)
Injury context	(27) Any involved products, (28) patient's activity at the time of injury (a free text field to describe patient's activity)
Safety equipment	(29) Use of safety tools, (30) color of the clothes
Injury intention	(31) Injury intention
Parent's supervision	(32) Parent's supervision
Coalition of stakeholders	
Members of the coalition	(1) Ministry of Health and Medical Education, (2) healthcare organizations/hospitals, (3) forensic medicine, (4) police, (5) Ministry of Roads & Urban Development, (6) insurance companies, (7) NGOs, (8) Legislature of Iran, (9) Iran Broadcasting Organization, (10) state governors, (11) mayors, (12) fire departments, (13) standard organization, (14) red crescent
Leadership of the coalition	(15) Ministry of Health and Medical Education
Data collection	
ISS type	(1) Comprehensive child ISS
Data collection method	(2) Active including data collection by child ISS officers, (3) inactive including data collection by healthcare providers and facilities, (4) a combination of both methods
Data entry method	(5) Online
Case definition	(6) the first visit of one person
Data entry criteria	(7) ICD-10 revision codes including (S00–S99), (T00-T78), (V01-X59), (X60-X84), (X85-Y09), (Y10–Y34), (Y35–Y36) and other injury related codes
Data entry time interval	(8) Monthly data registration as it needs at least a complete month to determine patients' final outcome
Classification	(9) ICD-10 revision
Data analysis and interpretation	
Indicators	(1) Injury/death frequencies, (2) injury/death percentages, (3) injury/death rates, (4) injury/death rates in special groups, (5) adjusted injury/death rates, (6) years lived with disability, (7) years of potential life lost, (8) disability-adjusted life year, (9) admission rates, (10) disability rates, (11) trends over time, (12) direct costs, (13) indirect costs, (14) costs payable to relatives, (15) geographical analysis using GPS data to create spot map, (16) area or choropleth map, (17) black spots
Analysis level	(18) National, (19) provincial
Data distribution	
Data distribution methods	(1) Organizational newsletter, (2) newspaper, (3) mass media (TV and radio), (4) social media (face book, twitter, Instagram, etc.), (5) scientific papers published in journals and conferences, (6) educational leaflet and pamphlet in healthcare centers and hospitals for patients, (7) reports and governmental documents, (8) discussion of child injury data/reports in meetings, (9) websites of related offices affiliated to Ministry of Health as well as coalition of stakeholders
Audience	(10) Ministry of Health and Medical Education, (11) healthcare organizations/hospitals, (12) forensic medicine, (13) police, (14) Ministry of Roads & Urban Development, (15) Plan and Budget Organization, (16) Ministry of Education, (17) Ministry of Science, Research and Technology, (18) State Welfare Organization of Iran, (19) Iranian Social Security Organization, (20) insurance companies, (21) NGOs, (22) Legislature of Iran, (23) the Executive (government), (24) Judicial System of Iran, (25) Iran Broadcasting Organization, (26) the public, (27) journalists, (28) researchers, (29) fire department, (30) Standard Organization, (31) municipalities
Time intervals of reports	(32) Monthly, (33) quarterly, (34) every six months, and, (35) annual reports based on the type of the audience, (36) ad hoc reports such as injuries on special occasions, national festivals, etc.

ISS: injury surveillance systems, NGOs: non-governmental organization.

of this framework such as describing injury event, activity of the patient child at the time of injury, parents' supervision, use of protective devices and region of residence can provide this opportunity for analysts to analyze data and identify possible child injury risk factors. Variables such as injury nature and injury mechanism based on international classification of disease-10 also provides more structured data to analyze injury cause and the affected areas with more details.[32]

Previous studies indicated that in the current injury data collection systems in Iran, deaths occurring at the injury scene,

deaths occurring after leaving the emergency department (ED) for an operating ward, or following hospital discharge are not registered at ED of hospitals.[33–35] The same is true about injury patients who receive care at the scene of injury and do not attend an ED for further medical treatment.[33] It is estimated that the latter group forms 30% of unintentional injuries in Iran.[17] Thus, current systems fail to cover a considerable amount of fatal and nonfatal injury cases. Data sources proposed in this framework address this challenge by considering data from various existing injury mortality and morbidity data collections. For instance, prehospital emergency data is a valuable data source for injuries/deaths occurred at the scene and which are not referred to a medical facility.[36]

Using different data sources leads not only to expanded data coverage but also to a 360° perspective of injury incidents. The importance of considering a variety of data sources for data collection has been recognized in different literature.[14,31,37] WHO emphasizes on postmortem or pathology reports, police reports, ED injury records, hospital inpatient records, trauma registries, ambulance records, community-based or household surveys, transportation department reports, records of car insurance companies, occupational safety or industrial, compensation records, rehabilitation centers and national insurance schemes as potential sources of data[31] that each country can take into consideration based on its available resources.

Previous studies also indicate that current data collections in Iran is operated partial electronically to collect injury data.[9] Data are consequently submitted to Iran Ministry of Health and Medical Education (MOHME) for national data integration, quality control check, analysis and dissemination which provides annual national reports.[4,33,38–40] Data collected in this way lacks timeliness as it takes a complete year for MOHME staff to gather, integrate, check quality controls, analyze and make reports out of received injury data files from all over the country.

Prior studies in Iran have demonstrated that injury data are analyzed using descriptive statistics such as frequencies and percentages, and more advanced analysis is not available.[41] The proposed framework in this study highlights the importance of considering analytical statistics and geographic based analysis to demonstrate black spots or spot maps on child injuries. Application of GPS could provide required geographical data for more improved analysis.

Researches also specifies that child injury reports are not well communicated through the healthcare system and stakeholders in the country. Evaluation studies have revealed that data usage is the weakest part of this system in Iran.[41] The ultimate goal of every injury surveillance system is to provide data for action. Designing, implementing, monitoring and evaluating interventions aimed at preventing child injuries is only possible when required data for identifying causes of the problem as well as factors are well communicated between different stakeholders.[31]

Although Iran took significant steps to develop and promote the ED surveillance system, based on an evaluation in 2009,[41] the system required major modifications in data collection and dissemination process to make it more operative and useful for injury prevention activities. Many researchers even believe that the system may not be entitled an injury surveillance system as it does not comply with formal standard definition of an injury surveillance system in terms of “ongoing” systematic and regular injury data collection process and data usage.[15,42]

This study has some limitations. Firstly, the opinions of experts in this study are based on the available resources and capacity of each data source, which is responsible for injury data collection. This could affect the amount of data which is to be collected. Secondly, injury is a multi-factorial public health problem requiring cooperation and coordination between different stakeholders. Although a coalition of stakeholders was agreed in this study, it does not guarantee the real collaboration of the identified organizations. Legislation can contribute to assure this commitment and to further recognize bodies and stakeholders who are responsible and accountable against national laws in reducing child injuries.

In conclusions, this study provided a framework on the major components, elements, and their description of a child ISS in an Iranian setting. The purpose is to standardize child injury data collection procedure and assist in designing evidence-based injury prevention interventions for health policy-makers. The framework is also meant to accomplish the following: to (1) improve the coordination and cooperation between the stakeholders, (2) increase the efficiency of data sharing and access, and (3) increase the early adoption of appropriate prevention intervention. This framework serves as the first step to informing public health policy-makers about ideal structure of a child ISS in Iran. The next step is to compare the current state of child injury surveillance to the framework presented in this study. This will identify gaps in data collection, data analysis and data dissemination with the ultimate goal of proposing a solution that can help narrow the gap between the standard state and the current state. This framework should also be recurrently reviewed to ensure consensus remains consistent with current injury surveillance literature and national guidelines.

Funding

This work was supported by the Iran University of Medical Sciences [grant number IUMS.SHMIS 1394-9221563201].

Ethical Statement

The study was reviewed and approved by Iran University of Medical Sciences Ethics Committee. Subjects participated in different parts of this research gave informed consent to the work. Human and/or animal subjects were not included in this study. Personal data privacy is well protected.

Declaration of Competing Interest

The authors report no conflicts of interest.

Acknowledgement

The authors wish to sincerely thank all participants of this study who contributed in interviews as well as the modified Delphi method.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.cjtee.2020.08.007.

References

1. WHO. *The Global Burden of Disease: 2004 Update*. Switzerland: WHO Press; 2008.
2. WHO. In: Peden M, Oyegbite K, Ozanne-Smith J, et al., eds. *World Report on Child Injury Prevention*. Switzerland: World Health Organization Press; 2008.
3. WHO. *Profile of Child Injuries: Selected Member States in the Asia-Pacific Region*. World Health Organization; 2010.
4. Haji Aghajani M, Haddadi M, Saadat S. Epidemiological pattern of injuries in Iran; a nationwide review of seven million emergency department admissions. *Emergency*. 2017;5:e10.
5. Mohammadi MR, Zarafshan H, Khaleghi A. Child abuse in Iran: a systematic review and meta-analysis. *Iran J Psychiatry*. 2014;9:118–124.

6. Naghavi M, Abolhassani F, Pourmalek F, et al. The burden of disease and injury in Iran. 2003. *Popul Health Metrics*. 2009;7:9. https://doi.org/10.1186/1478-7954-7-9.
7. Mehdizadeh Esfanjani R, Sadeghi-Bazargani H, Golestani M, et al. Domestic injuries among children under 7 years of age in Iran; the baseline results from the Iranian First Registry. *Bull Emerg Trauma*. 2017;5:280–284. https://doi.org/10.18869/acadpub.beat.5.4.436.
8. Naghavi M, Pourmalek F, Shahraz S, et al. The burden of injuries in Iranian children in 2005. *Popul Health Metrics*. 2010;8:5. https://doi.org/10.1186/1478-7954-8-5.
9. Khorasani Zavareh D, Mohammadi R, Laflamme L, et al. Estimating road traffic mortality more accurately: use of the capture-recapture method in the West Azarbaijan province of Iran. *Int J Inj Contr Saf Promot*. 2008 Mar;15:9–17. https://doi.org/10.1080/17457300701794105.
10. Centers for Disease Control and Prevention National Center for Injury Prevention and Control. *National Action Plan for Child Injury Prevention*. Atlanta (GA): CDC, NCIPC; 2012.
11. Vimpani G. A key to effective control of childhood injuries. *J Paediatr Child Health*. 1989;25:10–13. https://doi.org/10.1111/j.1440-1754.1989.tb01405.x.
12. Mock C, Quansah R, Krishnan R, et al. Strengthening the prevention and care of injuries worldwide. *Lancet*. 2004;363:2172–2179. https://doi.org/10.1016/S0140-6736(04)16510-0.
13. Graitcer PL. The development of state and local injury surveillance systems. *J Saf Res*. 1987;18:191–198. https://doi.org/10.1016/0022-4375(87)90082-X.
14. Stone DH, Morrison A, Ohn TT. Developing injury surveillance in accident and emergency departments. *Arch Dis Child*. 1998;78:108–110. https://doi.org/10.1136/adc.78.2.108.
15. WHO. In: Holder Y, Peden M, Krug E, et al., eds. *Injury Surveillance Guidelines*. Geneva: World Health Organization, Centers for Disease Control and Prevention; 2001.
16. Espitia Hardeman V, Paulozzi L. *Injury Surveillance Training Manual: Instructor Guide*. Atlanta (GA): Centers for Disease Control and Prevention, National Center for Injury Prevention and Control; 2005.
17. Azadi T, Khorasani-zavareh D, Sadoughi F. Barriers and facilitators of implementing child injury surveillance system. *Chin J Traumatol*. 2018;22:228–232. https://doi.org/10.1016/j.cjtee.2018.09.003.
18. Soori H, Khodakarim S. Child unintentional injury prevention in eastern mediterranean region. *Int J Crit Illn Inj Sci*. 2016 Jan-Mar;6:33–39. https://doi.org/10.4103/2229-5151.177366.
19. Soori H, Naghavi M. Childhood deaths from unintentional injuries in rural areas of Iran. *Inj Prev*. 1998;4:222–224. https://doi.org/10.1136/ip.4.3.222.
20. Rezapur-Shahkolai F, Naghavi M, Vaez M, et al. Injury incidence, healthcare consumption and avenues for prevention: a household survey on injury in rural Twiserkan, Iran. *Publ Health*. 2009;123:384–389. https://doi.org/10.1016/j.puhe.2009.03.010.
21. Karimi N, Beiki O, Mohammadi R. Risk of fatal unintentional injuries in children by migration status: a nationwide cohort study with 46 years' follow-up. *Inj Prev*. 2015;21:e80–e87. https://doi.org/10.1136/injuryprev-2013-040883.
22. Mohammadi R, Ekman R, Svanström L, et al. Unintentional home-related injuries in the Islamic Republic of Iran: findings from the first year of a national programme. *Publ Health*. 2005;119:919–924. https://doi.org/10.1016/j.puhe.2005.01.012.
23. Zargar M, Sayyar Roudsari B, Shadman M, et al. Pediatric transport related injuries in Tehran: the necessity of implementation of injury prevention protocols. *Injury*. 2003;34:820–824. https://doi.org/10.1016/S0020-1383(02)00378-9.
24. Rezapur-Shahkolai F, Afshari M, Moghimbeigi A, et al. Home-related injuries among under-five-year children and mothers' care regarding injury prevention in rural areas. *Int J Inj Contr Saf Promot*. 2017;24:354–362. https://doi.org/10.1080/17457300.2016.1200628.
25. Kelishadi R, Qorbani M, Motlagh ME, et al. Frequency, causes, and places of unintentional injuries in a nationally representative sample of Iranian children and adolescents: the CASPIAN-IV study. *Int J Prev Med*. 2014;5:1224–1230.
26. Custer RL, Scarcella JA, Stewart BR. The modified Delphi technique - a rotational modification. *JCTE*. 1999;15. EJ590767.
27. Lynn MR. Determination and quantification of content validity. *Nurs Res*. 1986;35:382–385. PMID: 3640358.
28. Eubank BH, Mohtadi NG, Lafave MR, et al. Using the modified Delphi method to establish clinical consensus for the diagnosis and treatment of patients with rotator cuff pathology. *BMC Med Res Methodol*. 2016;16:16–165. https://doi.org/10.1186/s12874-016-0165-8.
29. Mitchell R, Testa L. Child injury surveillance capabilities in NSW: informing policy and practice. *Public Health Res Pract*. 2017;27. https://doi.org/10.17061/phrp2741734.
30. Boulkedid R, Abdoul H, Loustau M, et al. Using and reporting the Delphi method for selecting healthcare quality indicators: a systematic review. *PloS One*. 2011;6, e20476. https://doi.org/10.1371/journal.pone.0020476.
31. WHO. *Preventing Injuries and Violence: A Guide for Ministries of Health*. Geneva, Switzerland: World Health Organization; 2006.
32. Clark DE, Black AW, Skavdahl DH, et al. Open-access programs for injury categorization using ICD-9 or ICD-10. *Inj Epidemiol*. 2018;5:11. https://doi.org/10.1186/s40621-018-0149-8.
33. Rasouli MR, Saadat S, Haddadi M, et al. Epidemiology of injuries and poisonings in emergency departments in Iran. *Publ Health*. 2011;125:727–733. https://doi.org/10.1016/j.puhe.2011.07.006.
34. Khorasani-Zavareh D, Mohammadi R, Bohm K. Factors influencing pre-hospital care time intervals in Iran: a qualitative study. *J Inj Violence Res*. 2018;10:83–90. https://doi.org/10.5249/jivr.v10i2.953.
35. Bigdeli M, Khorasani-Zavareh D, Mohammadi R. Pre-hospital care time intervals among victims of road traffic injuries in Iran. A cross-sectional study. *BMC Publ Health*. 2010;10:406. https://doi.org/10.1186/1471-2458-10-406.
36. Seyyednozadi M, Jarahi L, Erfanian MR, et al. Pre-hospital emergency medical services: an epidemiological survey in Mashhad, Iran. *Patient Saf Qual Improv*. 2017;5:572–576. https://doi.org/10.22038/PSJ.2017.9040.
37. Bhalla K, Naghavi M, Shahraz S, et al. Building national estimates of the burden of road traffic injuries in developing countries from all available data sources: Iran. *Inj Prev*. 2009;15:150–156. https://doi.org/10.1136/ip.2008.020826.
38. Sadeghi-Bazargani H, Mohammadi R. Unintentional domestic burns in Iran: analysis of 125,000 cases from a national register. *Burns*. 2013;39:1304–1310. https://doi.org/10.1016/j.burns.2013.02.013.
39. Fardiazar Z, Sadeghi-Bazargani H, Mohammadi R. Domestic injuries and suicide among women of reproductive age in Iran. *Int J Gen Med*. 2012;5:547–552. https://doi.org/10.2147/IJGM.S31429.
40. Sharif-Alhoseini M, Rasouli MR, Saadat S, et al. Suicide attempts and suicide in Iran: results of national hospital surveillance data. *Publ Health*. 2012;126:990–992. https://doi.org/10.1016/j.puhe.2012.06.006.
41. Motevalian SA, Tehrani A, Haddadi M, et al. Strengthening injury surveillance system in Iran. *Chin J Traumatol*. 2011;14:348–353. PMID: 22152138 Pubmed.
42. Thacker SB, Stroup DF, Parrish RG, et al. Surveillance in environmental public health: issues, systems, and sources. *Am J Publ Health*. 1996;86:633–638. https://doi.org/10.2105/ajph.86.5.633.