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Original Article

# Barriers and facilitators of implementing child injury surveillance system

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ABSTRACT

*Purpose:* Child injuries are a global public health problem and injury surveillance systems (ISS) can be beneficial by providing timely data. However, ISS implementation has challenges. Opinions of stakeholders of ISS implementation barriers and facilitators are a good source to understand this phenomenon. The aim of this study is to investigate barriers and facilitators of implementing ISS in Iran.

*Methods:* This is a qualitative study. Data were gathered through interviews with 14 experts in the field of child injury and prevention from Iranian Ministry of Health and Medical Education (MOHME), medical universities, pediatrics hospitals, general hospitals and health houses during January 2017 to September 2017. Data collection and analysis continued until data saturation. Data were analyzed using content analysis through identifying meaning units.

*Results:* Barriers were classified in three main categories and nine subcategories including management barriers (including performance, coordination and cooperation, supervision and attitude), weakness in data capture and usage (including data collection, data recording and data dissemination) and resource limitation (including human and financial resources). Facilitators identified in three areas of policy making (including empowerment and attitude), management (including organization, function and cooperation and coordination) and data recording and usage (including data collection/distribution and data recording).

*Conclusion:* The most important barrier is lack of national policy in child injury prevention. The most important facilitator is improving MOHME function through passing supportive regulations. Effective data usage and dissemination of information to those requiring data for policy making can help reduce child injuries. Coalition of stakeholders helps overcome existing barriers.



## Introduction

Child injuries are a major global public health problem increasing globally. Each year hundreds of thousands of children die due to injuries or aggression and million more suffer the consequences of nonfatal injuries.[1] According to World Health Organization Report in 2004, crashes and violence were cause of 51% (950000) of death among children and adolescent in which unintentional injuries were the main cause of death among children aging from 10 to 19 years old.[2]

In overall, 12% of all death due to unintentional injuries among children less than 20 years of age in the world occurs in the East Mediterranean region which is about 19% more than its global rate. Road traffic injuries, drowning, burning, falling and poisoning are the five main cause of death due to unintentional injuries in the East Mediterranean region. Based on the statistics from Iranian Child Health Bureau, in average, unintentional injuries account for 20.2% of death in children less than five years old.[3]

Although considerable progress has been achieved in reducing child injury rates and death due to injuries in recent years, yet more has to be done specifically in low and middle income countries (LMICs) where the magnitude of the problem is bigger.

Injury surveillance systems through systematic data collection, analysis, interpretation and dissemination help identify injury patterns and magnitude of the problem and provide necessary data

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for health policy makers to decide on preventive measures which in turns help reduce injury in children.[1] Different studies have evaluated the usefulness of injury surveillance systems in providing data about injury trend, identifying high risk groups and prevention programs.[4–9] However, implementing an injury surveillance system is a challenging task and only a few high income countries are of formal injury surveillance system. LMICs usually rely on other sources of data such as police, hospital or vital statistics to collect injury data.[4] Previous studies mainly have focused on epidemiological aspect of injury surveillance in children and less has addressed the challenges and facilitators of implementing injury surveillance system especially in children. Moreover, quite many studies regarding child injuries and prevention have done in Iran but the majority of this research is limited to epidemiologic studies[10–17] and less has addressed the problem using qualitative approaches to investigate this phenomenon. Among the few qualitative studies, most has addressed the perspectives of child caregivers[18,19] and almost to the knowledge of researcher none has performed to investigate the experience of field experts as a valuable source of knowledge to improve the current state. Thus, the aim of this research is to investigate the barriers and facilitators of implementing a child injury surveillance system from the perspective of field experts using qualitative approach in a middle income country, Iran.

## Methods

The interviews have performed among experts in the field of public health and child injury mainly at the Iranian Ministry of Health and Medical Education (MOHME) in Tehran, Iran during January 2017 to June 2017.

Participants included 12 experts in the fields of epidemiology (3 persons), pediatrics (3 persons), social medicine (2 persons), safety promotion and injury prevention (1 person), health information management (2 persons), injury prevention (1 person) and two staff collectively comprising a total of 14 field experts in MOHME, medical universities, pediatrics hospitals, general hospitals and rural health houses. Participants were selected based on snow ball sampling technique and identifying new participants continued based on the data saturation principle.

Data collection was carried out by means of a previously researcher-made interview guide consisting of demographics data and open-ended questions in the Persian language. Questions were asked about participants' experiences on the current state of Iran regarding child injury data collection, analysis, and interpretation, reporting and designing and implementing preventive measures to reduce child injuries. Moreover, participants were asked to explain their opinion of existing barriers and recommendations for improvement the current state of Iran.

All recorded interviews as well as taken notes were transcribed verbatim. Data analyzed in line with qualitative content analysis instructions given at the respective reference.20 Transcriptions were reviewed by the main researcher and open coding for the smallest possible meaning unit took place. Codes were revised and were classified in some selected groups and subgroups based on their similarity and differences. After the seventh interviews, data collection and analysis were performed simultaneously to identify areas needing more clarification and saturation. Thus, data collection continued until data saturation was achieved.

Codes were revised by one of the team members with experience and expertise in qualitative research. This study has performed in line with adhering to data privacy, informed consent and integrity concerns in reporting the results. Prior to the interviews, participants were informed of the goal of the research and the interview, option of voluntary participation and adherence to the data protection. Informed consent was taken in written and before each interview permission to record was asked.

## Results

Barriers were categorized in three main categories and nine subcategories. Management barriers (including four subcategories of performance, coordination and cooperation, supervision and attitude), poor data capture and usage (including three subcategories of data collection, data recording and data dissemination) and resource limitation (including two subcategories of human and financial resources) were the three main challenges. A sample of codes demonstrating the barriers are presented in Table 1.

### *Management barriers*

#### *Performance*

All participants held poor management as one of the most important barriers. Poor management includes weakness in execution of preventive measures and in using data. Participants believed that MOHME is not of required authority and executive power to implement multisector preventive measures.

> *(Participant 5) We need surveillance to make us able to design preventive interventions. (Participant 4) On the one hand, interventions are expensive and on the other hand, it includes a wide range of activities and coordination which all of them are not on the MOHME's authority.*

Weaknesses in delivering formal and informal education to stakeholders (parents/child caregivers and related health staff at hospitals) were another obstacle. According to the participants, education for parents and child caregivers is inadequate and is not provided in distant areas. Currently, there are no academic discipline in the field of safety promotion and injury prevention, and the number of studies conducted is limited to student theses.

> *(Participant 3) Major child unintentional injuries occur due to negligent of caregivers. Education is needed and this is the responsibility of MOHME. Maybe we have not done so well. (Participant 9) Most research on child injuries is done by researchers based on their personal interest. We do not have a single course on injury prevention at universities. So, how can our graduates know about the subject and understand its significance?*

Several strategies were put forward to overcome poor management. Provision of necessary infrastructure through legislation and formulation of a national policy on child injury prevention are important strategies contributing to better funding and establishment of a child injury surveillance system. Targeting and empowerment through formal and informal training is essential. Purpose of collecting data and use of information that is supposed to be aggregated should be defined before implementation.

> *(Participant 11) Awareness of mothers, especially in small villages and towns, is lower and mothers with more children are less likely to pay attention to child care. It is essential to teach mothers especially in remote and rural areas.*

#### *Cooperation and coordination*

Almost all participants considered in-house cooperation within government agencies extremely weak. As a result, some programs and activities are carried out in parallel with different departments in the same organization. Participants also emphasized on the lack

**Table 1**
Sample of codes in terms of barriers of implementing child injury surveillance system in Iran.

| Category | Subcategory | Code |
|---|---|---|
| Management | Performance | - Weakness in action from data collected |
| | | - Lack of policy in child injury prevention |
| | | - Old organizational structure of MOHME (not fit for the current health problem) |
| | | - Lack of enough executive power in MOHME to implement injury prevention measures |
| | | - Weakness in delivering education to stakeholders |
| | Coordination and cooperation | - Low cooperation within different MOHME offices |
| | | - Low coordination between different beneficiary organizations |
| | | - Lack or very limited data sharing between beneficiary organizations |
| | Supervision | - Lack of supervision and quality control over data registration in hospitals/emergency departments |
| | | - Lack of follow up measures regarding effectiveness of child injury preventive measures |
| | Attitude | - Lack of a comprehensive and precise look toward child injury among MOHME |
| | | - Not considering quality data capturing in hospitals as an important issue among MOHME |
| | | - Lack of national commitment toward child injury prevention |
| Weakness in data capture and usage | Data collection | - Failure to collect data on child injury risk factors |
| | | - Lack of continuous data collection for child injuries |
| | | - Open fields for coding |
| | | - High amount of under reporting and missing values |
| | Data recording | - Failure to receive software support for the current injury surveillance system |
| | | - Lack of creating a relation between population-based surveys and existing systems |
| | | - Failure to record pre-hospital and post-hospital data |
| | | - Failure to record the nature and cause of the injury |
| | Data dissemination | - Failure to report injury burden of children |
| | | - Incomplete reporting to stakeholders |
| | | - No dissemination of information and reports on the MOHME's website |

of inter-organizational coordination among different organizations such as municipality, police, insurance, etc., who are reluctant to share their data and reports. Most organizations have made it hard for researchers to get access to data and reports for research projects. Participants believed that due to the multidisciplinary nature of injury, the key to preventing child injuries is increasing multi-sector collaborations.

*(Participant 9) Since injuries are multi-faceted, they require cross-sectional partnerships between different organizations and although MOHME plays an important role as coordinator, it is not the only responsible body. (Participant 14) It is very important that a coalition from various organizations such as the Ministries of Health, Roads, Municipality, Police, Insurance, Medical Universities, Pediatric Hospitals, etc. be formed to support child injury surveillance system.*

*Supervision*

Most participants believed there is no monitoring over data collection process in emergency departments or it is poor. They held one of the reasons that data recording is not taken seriously in hospitals is due to lack of supervision on staff performance in terms of data collection. Some participants stated that MOHME doesn't have a specific target for collecting child injury data.

*(Participant 1) There should be an evaluation plan to closely monitor data collection process at target centers. (Participant 2) Perhaps, if fines were imposed on the incomplete collection of data, we would see improvements and positive changes in the process of data collection.*

Participants believed that it is necessary to have a specific mechanism for monitoring the data recording process and may be to impose some sort of fines in the event of incomplete or incorrect data recording to increase completeness.

*Attitude*

According to the participants, there is no national sensitivity and determination among different organizations and child injury prevention is not a priority of MOHME now.

*(Participant 5) Despite the fact that police are sensitive to the use of helmets, they don't stop the rider if they see a ride without a helmet for a child or a companion. (Participant 2) The importance of health statistics and information, especially in decision making, is not clear to everyone, or if its importance, it is not a priority.*

The participants emphasized on the role of legislation to recognize child injuries. Legislation can help change people's attitudes and provide the necessary ground for the establishment of a child injury surveillance system.

*Poor data capture and usage*

*Data collection*

The current system gathers data about patient demographics, crash area (urban, rural, out of urban or rural areas, unknown), location of crash (public places, sports facilities and recreational, highway and road, street, work place, school and educational places, home, other, unknown), type of crash (electric shock, car crash, motorcycle crash, pedestrian crash, animal attack, fall, burn, hits, scorpions and snakes bites, drowning, poisoning) and the outcome of crash (under treatment, death and disability). Quality of collected data in some field such as outcome is poor since it does not record the true outcome in consistent with standard definitions. Under reporting is also high in the current data collection system.

*(Participant 5) We need to know if a child safety seat has been used in a traffic crash. We do not currently have this information. (Participant 5) The injured person is admitted to the emergency department (ED), whose information is recorded. He leaves the ED and we no longer have any information about him, so the actual outcome of the patient is not recorded.*

It is necessary to obtain and provide the necessary information as soon as possible from the injured person at the ED. It is also important to record and analyze the data needed to identify risk factors in order to design preventive measures.

*Data recording and dissemination*

Lack of data exchange between other health data collection systems such as pre-hospital data and data from demographic surveys are not possible.

> *(Participant 5) Software was developed by a company that didn't provide any support for its upgrade. So, new variables couldn't be added.*

Burden and trend of injury in children are not calculated and MOHME only reports on epidemiologic pattern of injury that is repetitive every year. Also, reporting methods are not inclusive. Most of the participants complained about lack of reports on injuries and poorly distributed information.

> *(Participant 10) Information may be collected on a regular basis, but it is not analyzed and distributed. Basically, the stakeholders have not been identified, and because the information is not of a specific focus, they are not sent to specific stakeholders.*

Modification in data recording forms to capture the required data and doing quality control was raised as suggestions. Reporting should be improved as well to provide stakeholder with the latest injury reports and information.

## Discussion

To the best of our knowledge, this study is the first in its kind as it is used qualitative approach to explore challenges and facilitators of implementing child injury surveillance system in Iran. The findings revealed that the most important barriers are related to management, data capture and usage and resource provision.

One of the reasons for poor management is due to lack of national policies in this area. Currently, Iran similar to some other LMICs is not of a national action plan on reducing child injuries.[21] National policies are more limited to high-income countries. Examples include the US, Finland, Sweden and Australia.

Coordination and cooperation are weak for a variety of reasons such as the difficulty of teamwork, unwillingness to share information, confidentiality of information and having the ownership sense of information.[22] Another research in Iran indicated lack of coordination among trauma system organizations as one of the problems with trauma care in Iran.[23] Similar to our results, in a study aimed at estimating the exact number of deaths due to road traffic crashes in Iran, lack of data sharing was identified as one of the reasons of underreporting especially in children and women.[24] Also, similar to our finding, parallel work and poor communication for sharing the road traffic injury data have been identified as challenges to the establishment of the injury surveillance system in Iran and in Pakistan.[25,26] Formation of a coalition to support child injury surveillance system goals facilitates data sharing and agreeing on access and use of data. Ministry with the main responsibility of people's health is focusing more on the treatment and delivering almost free and fair health care services, especially through the development of health revolution plan in the recent years. This can be said to have affected the issue of injury prevention since most resources are currently spent on treatment rather than prevention.

MOHME does not have a clear plan on child injury prevention, subsequently, the collected data are not interpreted and disseminated appropriately among the stakeholders, and the public is not informed.[27] This is unlike the experience of successful countries in the prevention of fatal road traffic injuries. In Sweden, all information about traffic-related deaths during around a 60-year period have been analyzed and published on the Ministry of Roads website for the public access.[28] Or, in the United States, all fatal and nonfatal injury data is easily available through the web.[29] Another example is the Gapminder which is a website which distributes raw information on the deaths caused by RTIs in many countries.

Purposeful data collecting requires identifying the target group first. Children's group is even more affected by underreporting even among the road traffic victims. This could be due to lack of attention to this group. In a study in Vietnam, it was observed that children were more affected by underreporting, due to insufficient attention to this group.[30] Underreporting in child's death due to rad traffic injuries cannot be said in a country like Iran, but the present data suggest that this group is more influential.[24] This requires more studies.

While using the collected data to design interventions is the most important part of a surveillance, previous studies indicated this is the weakest part of the Iran's injury surveillance system.[24,31] The situation is different in high-income countries. In Canada, injury data have been used for legislation and creation of standards for safe products, such as the prohibition of using the baby walker, the use of helmets for bicycles and the use of child seats in cars.[32]

Currently, data about the outcome of the incident is not useable because it is unable to record the exact outcome of the incident. Although there is no accurate statistic available, about 48% of deaths happen during patient transfer to the hospital or in the hospital. The current system cannot detect this type of outcomes as well as the disabilities. Although this percentage has varied significantly from 2004 to 2018 (death in the scene was reduced from 67% to 52%), but due to the lack of a surveillance system, there is no possibility of giving a certain comment on it.[26,33,34]

Under reporting, especially in relation to child mortality and injury, has been reported in other similar studies in high-income countries such as Canada,[35] low-income countries such as Vietnam[30] and Pakistan[26] and middle income countries such as Iran.[34] Two Vietnamese studies have shown that families are less likely to report children's deaths for reasons such as religious beliefs.[30] The quality and completeness of infant deaths in Vietnam's death record have been reported less than other age groups.[30] This emphasizes the need for more attention to record the deaths and injuries of children both in high income countries and in LMICs.

In conclusion, researchers tried to conduct in-depth interviews and performed several follow-up contacts until data saturation of the concepts. This led to the large and deep data collection for analysis and interpretation and better understanding of the phenomena. Also, participants were introduced from experts who are well experienced at various levels of the health care system of Iran.

The results of this study provide important strategies to help strengthen the child injury surveillance system in Iran. It is concluded that poor management could be due to lack of having a national policy such as an action plan on child injury prevention.

The most important solution was introduced as management enhancement by relying on legal support and political commitment. Also, with strengthening and developing use of existing information for the designing preventive interventions, effective steps can be taken to reduce child injuries. To this end, a coalition of different stakeholder from different sections must be formed to support the goals of the child injury surveillance system and can engage resources to implement interventions.

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## Ethical statement

This study has been approved by the local ethics committee and all subject data are kept confidential.

## Conflicts of interest

The authors declare no conflicts of interest.

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