Introduction

Approximately 1.35 million people die each year as a result of road traffic injuries (RTIs) and 93% of which occur in low- and middle-income countries. RTIs are the main leading cause of death for children and young adults aged 5–29 years.1 Between 20 and 50 million more people suffer non-fatal injuries, and many of them suffer disability due to their injuries.1 RTIs are responsible for the largest proportion of unintentional injuries and mortalities in the world.3 RTIs cause significant economic losses for individuals, families, and nations. These losses are due to the cost of treatment as well as the lost productivity for those who have been killed or disabled as a result of the injuries.3 Regarding the considerable financial consequences of RTIs, the World
Health Organization (WHO) reported that injuries and mortality caused by RTIs cost 5% of the gross domestic product (GDP) in low- and middle-income countries. Without increased efforts and activities, RTIs are predicted to become the seventh leading cause of death by 2030.

Healthcare facilities preparedness is critical to reduce the risk and negative impact of disasters and emergencies. Hospitals should provide effective and continuous medical services during disasters and emergencies. At the time of RTIs with mass casualties, hospitals are the first place where injured people are taken to, and thus, hospitals will be overcrowded and incapable. Therefore, hospitals should be prepared for providing healthcare services in RTIs through context-based planning.

According to the Hospital Safety Index developed by the WHO, the most important functional factors of hospitals are having a preparedness plan for dealing with emergencies and disasters. It is necessary that hospitals be ready before the emergencies and disasters from all aspects. Evaluation of hospital preparedness can lead to identifying the current preparedness gaps which may limit the hospital response at the time of RTIs. Various dimensions, including structural, non-structural, and functional preparedness; personnel preparedness; and disaster plan implementation, have been considered for evaluating hospital preparedness for emergencies and disasters. Although there is an all-hazard approach to disaster and emergency planning, some incidents are different and need more attention than others; furthermore, having a specific contingency plan is essential. There is a gap in designing and developing a valid and reliable tool to evaluate the levels of hospital preparedness during RTIs with mass casualties. Filling this gap, the present study aimed to design and validate a tool for evaluating hospital preparedness in RTIs with mass casualties.

Methods

This was a mixed method study which was conducted from October 2017 to September 2018 in two stages of tool design as well as validity and reliability measurements.

Stage 1: tool design

In this stage, domains, sub-domain, and appropriate items were identified and generated using literature review and panels of experts. Accordingly, relevant studies with the subject of hospital preparedness in emergencies and disasters were searched through the Scopus, Web of Science, PubMed, ScienceDirect, Google Scholar, MEDLIB, IranDoc, Magiran, and SID databases. Searching for the articles was based on several key terms, including hospital preparedness, hospital readiness, disaster preparedness, mass casualty incidents, Road Traffic Injury, and Road Traffic Accidents, which were searched individually or in combination, using either OR/AND. In this stage, relevant studies in the domain of hospital preparedness in emergencies and disasters and especially in the road safety field were examined in relevant data sources, and all validated evaluation tools for hospital preparedness in emergencies and its dimensions were collected and examined. Panels of experts were another source of data collection for tool design. Four expert panels were held with the participation of eight experts who had knowledge and experience in the fields of health in disasters and emergencies. The data extracted from the literature review and panels of experts were used to design the first draft of the tool.

Stage 2: tool validity and reliability

This stage required the confirmation of a group of experts in order to show the validity of items and the entire tool. In this stage, the tool was examined by experts and items were developed to assess the variable of interest.

First, the tool was sent to 16 experts via email and in person. In the end, 14 experts judged the tool. The tool was examined by a group of three experts on emergency medicine, five faculty members in health in emergencies and disasters, three head nurses of the emergency department, and three experts on hospital disaster risk management.

Face validity

To examine face validity, the item impact score test was utilized. The 10 experts were first asked to rate the importance of each item on a 5-point Likert-type scale from “Totally important” (5), “Important” (4), “Moderately important” (3), “Slightly important” (2), and “Not at all important” (1). Next, the impact scores were calculated using the following formula

\[
\text{Impact score} = \frac{\text{Importance} \times \text{frequency} \%}{100}
\]

The impact score of an item must not fall below 1.5 for it to have face validity. Therefore, only items with an impact score of above 1.5 were considered as having an acceptable level of face validity.

Content validity

The content validity of the tool was examined based on Lawshe’s content validity ratio (CVR) and to examine content validity index (CVI), Waltz and Bausell’s content validity index (CVI). To determine the CVR, 14 experts were asked to rate the items on a scale of “It is essential,” “It is useful but not essential,” or “It is not essential.” Then, based on the following formula, CVR was calculated:

\[
\text{CVR} = \frac{(N_e - N/2)}{(N/2)}
\]

in which Ne is the number of panelists indicating “essential” and N is the total number of panelists. Based on Lawshe’s table, in order to determine the minimum value of CVR, items with a CVR of above 0.51 were considered significant.
To determine the CVI, experts expressed the relevance, clarity, and simplicity of each item on a 4-point Likert-type scale. Experts indicated the relevance of each item using 1 (“Not relevant”), 2 (“Somewhat relevant”), 3 (“Quite relevant”), or 4 (“Highly relevant”). Similarly, simplicity was rated 1 (“Not simple”), 2 (“Relatively simple”), 3 (“Simple”), or 4 (“Completely simple”), and clarity was rated 1 (“Not clear”), 2 (“Relatively clear”), 3 (“Clear”), or 4 (“Completely clear”). Then, based on the following formula, CVI = (Number of judges who rated 3 or 4/Total number of judges). The minimum acceptable value for CVI is 0.79, and if the CVI of an item was below this value, it would be eliminated.16,17

**Tool reliability**

To measure the reliability of the tool, the kappa coefficient was used. The kappa coefficient assesses the agreement between scores of observers, referees, or raters on a topic. It is used when a tool was filled by two or more interviewers on similar populations, and a general consensus regarding the tool is to be achieved.18 To assess inter-rater reliability, the tool was given to 10 independent experts. These experts were different from experts who participated in previous face and content validity. Experts administered the tool independently at different times by referring to one pilot hospital. The evaluators were blinded to the results of others, and they were not allowed to discuss the case with each other and were not allowed to exchange information.

**Results**

**Tool design**

In the first stage, based on the literature review and expert panels, 74 items were extracted. After deciding upon the items, the tool was developed in three sections: (1) general characteristics of the hospital; (2) various items on nine dimensions (command and control, infrastructure and medical equipment, information and communication systems, surge capacity, triage and medical services, safety and security, human resources management, coordination and cooperation, and training and exercise); and (3) a checklist of specific resources and equipment of trauma patient management in six dimensions (airway management, circulation, head, neck, and spinal cord trauma, chest and abdomen, limbs trauma, and burns and wounds). In the item generation step, 122 items were generated and 74 items were obtained from the review of sources and similar tools were combined. After reviewing the items, repetitive and overlapping items were removed. Finally, the preliminary tool had 174 items on nine dimensions of hospital preparedness as well as a checklist of specific resources and equipment of trauma patient management on six dimensions.

**Face and content validity**

To determine face validity, the tool was given to eight experts familiar with the topic and experienced in the field, including two experts on emergency medicine, one head nurse of the emergency department, one expert on hospital disaster risk management, and four experts on health in emergencies and disasters. They were asked to judge the simplicity, importance, and clarity of the items. Based on their opinion, some items were adjusted in terms of simplicity, clarity, and importance. In addition, the impact score of the items was calculated. The overall mean total impact score was 4.6. The results showed that six items have an impact score of below 1.5 and were, therefore, eliminated.

To determine content validity in the first round, 20 of the 168 items were eliminated. These items had a CVR of below 0.51 and were eliminated based on Lawshe’s table. Moreover, some eliminated items were combined with the remaining ones and edited based on the opinions of experts. Based on the opinions of experts in the first round, 148 of the remaining items were adjusted and were assessed to determine CVI. In this round, eight items with a CVI of below 0.70 were eliminated. Also, five items with a CVI of 0.70–0.79 were adjusted and edited based on expert opinion. After adjustment, the tool with 140 items was emailed to the panel members to determine validity in the third round. In the third round, one item with a CVI of below 0.70 was eliminated, and in the end, 139 items remained in the tool. Finally, Total CVR for the whole tool was 0.97, and also total CVI (average of CVIs of all items) for the whole tool was 0.98. Eventually, after assessing the face and content validity of the tool, 139 items including 78 items of the original tool and 61 items of the checklist of the specific resources and equipment of trauma patient management remained. (Tables 1 and 2).

In the final checklist for each item, a 3-point Likert-type scale was used (no = 0, somewhat = 1, yes = 2). In order to measure the hospital’s preparedness, three levels of good (with a preparedness of 66%–100%), moderate (with a preparedness of 34%–65%), and poor (with a mean of 0%–33%) were considered.

**Reliability results of tool**

Reliability of the tool was measured with percentage agreement and estimation of Fleiss kappa coefficient for all dimensions and total items. The estimated kappa coefficient was 0.89, which was classified as the strong level of agreement.18 Fleiss kappa coefficient of nine dimensions and total checklist are shown in Table 3.

**Discussion**

The development and validation of the tool for evaluation of hospital preparedness in RTIs with mass casualty was an
| No. | Items                                                                 | CVR | CVI      | Impact score |
|-----|-----------------------------------------------------------------------|-----|----------|--------------|
|     | **Command and control**                                               |     |          |              |
| 1.  | Are the plans and guidelines considering the hospital’s response to RTIs with mass casualties? | 1   | 1        | 5            |
| 2.  | Are financial sources allocated to these plans?                       | 1   | .92      | 4.8          |
| 3.  | Are these plans and guidelines followed in all wards?                | 1   | 1        | 4.8          |
| 4.  | Are plans reviews, exercises, revisions, and updating regularly performed? | 1   | 1        | 4.5          |
| 5.  | Is an ICS specified in the hospital?                                  | 1   | 1        | 5            |
| 6.  | Are representatives of the following departments members of the ICS:  | 1   | .92      | 4.9          |
|     | Hospital management, nursing management, laboratory, security, drug store, infection control, nutrition, facilities, services, and administrative and personnel affairs? |     |          |              |
| 7.  | Are the tasks and responsibilities of the members of ICS specified and notified? | 1   | 1        | 4.9          |
| 8.  | Have the members of ICS received the necessary training with regard to their role and status? | 1   | 1        | 4.8          |
| 9.  | Is the activation of ICS practiced at least twice a year?             | .92 | 1        | 3.87         |
|     | **Infrastructure and medical equipment**                               |     |          |              |
| 1.  | Are the available infrastructures required for responding at the time of RTIs? | 1   | 1        | 5            |
| 2.  | Trauma room                                                           | 1   | 1        | 4.8          |
| 3.  | Triage room                                                           | 1   | 1        | 4.8          |
| 4.  | Trauma ICU or ATLS                                                    | 1   | 1        | 4.5          |
| 5.  | Burns room                                                            | .92 | 1        | 4.5          |
| 6.  | Laboratory                                                            | 1   | 1        | 4.7          |
| 7.  | Isolation room for injured people with communicable or infectious disease | .85 | 1        | 3.69         |
| 8.  | Hospital ambulance for inter-hospital deployment and transporting      | 1   | 1        | 4.8          |
| 9.  | Parking space for pre-hospital emergency ambulances                   | 1   | 1        | 4.5          |
| 10. | Appropriate location for the one-way entrance/exit of ambulances       | 1   | 1        | 4.5          |
| 11. | Enough space in terms of bed occupancy in the emergency department     | 1   | 1        | 5            |
| 12. | Are the maintenance, safekeeping, safety, replacement of equipment and medications performed based on guidelines? | 1   | .92      | 3.87         |
| 13. | Is there sufficient equipment for personal protection and safety of personnel? | 1   | .92      | 4.7          |
| 14. | Are sufficient blood service supplies and equipment (e.g. blood set and blood warming pump) available? | 1   | .92      | 4.5          |
| 15. | Are safety, maintenance, and monitoring of blood products and equipment performed based on guidelines? | 1   | .85      | 3.69         |
|     | **Information and communication systems**                              |     |          |              |
| 1.  | Are communication services, including telephones, cell phones, radio, and satellite phones available in sufficient numbers? | 1   | 1        | 5            |
| 2.  | Are there standard messages and codes for paging and notifying red alerts and white alerts to personnel? | 1   | 1        | 4.7          |
| 3.  | Is the one in charge of sending red and white alerts known?           | 1   | 1        | 4.8          |
| 4.  | Is the hospital spokesman trained for notifying the public of incidents? | 1   | 1        | 4.5          |
| 5.  | Is there an information agreement between the hospital and other involved organizations? | .92 | 1        | 4.9          |
| 6.  | Does the medical information system (MIS) record RTIs?                | .92 | .92      | 4.5          |
| 7.  | Are the data related to RTIs managed, analyzed, and disseminated?     | .92 | .92      | 4.7          |
| 8.  | Is the trauma mortality committee formed in the hospital?              | .92 | 1        | 3.52         |
|     | **Surge capacity**                                                    |     |          |              |
| 1.  | Is the maximum capacity of the hospital calculated for accepting patients (number of beds, human resources, essential resources, equipment, and tools)? | 1   | 1        | 5            |
| 2.  | Are there appropriate guidelines or policies for increasing hospital capacity? | 1   | 1        | 5            |
| 3.  | Early patient discharge                                               | 1   | 1        | 4.8          |
| 4.  | Canceling elective and unnecessary surgeries                           | 1   | 1        | 4.7          |
| 5.  | Calculating maximum hospital capacity                                 | 1   | 1        | 5            |
| 6.  | Estimating the increase in demand/patient reception                   | 1   | 1        | 4.9          |
| 7.  | Existence of a model for increasing hospital capacity                  | 1   | 1        | 4.5          |
| 8.  | Transferring patients between hospital wards/units                    | 1   | 1        | 4.5          |
| 9.  | Compatibility and proportion between reception and discharge          | 1   | 1        | 4.5          |
| 10. | Temporary use of units such as stagnant archives                      | .92 | 1        | 3.87         |
| 11. | Home care for superficial injuries                                    | .85 | 1        | 3.69         |

(Continued)
| No. | Items                                                                 | CVR | CVI | Impact score |
|-----|----------------------------------------------------------------------|-----|-----|--------------|
| 12. | Are the required capacities (ventilators, incubators, and so on) available for vital life support and necessary cares for patients during transfer from the site of accident to the hospital? | 1   | .92 | 4.8          |
|     | **Triage and medical services**                                       |     |     |              |
|     | 1. Is there a standard and appropriate triage system?                 | 1   | .92 | 4.8          |
|     | 2. Are there guidelines for triage in RTIs with mass casualties?     | 1   | 1   | 5            |
|     | 3. Is sufficient training on triage in RTIs with mass casualties given to the personnel? | 1   | 1   | 5            |
|     | 4. Is an experienced triaging official (e.g. A doctor of emergency or medicine or trauma or a trained and skillful emergency nurse as a supervisor) assigned for supervising the triaging process? | 1   | 1   | 5            |
|     | 5. Are sufficient triage labels available?                           | .92 | 1   | 4.9          |
|     | 6. Are entrance/exit routes to triage and waiting areas specified?  | 1   | 1   | 4.8          |
|     | 7. Are entrance/exit routes to triage and waiting areas in appropriate conditions in terms of space, lighting, and safety? | .92 | 1   | 4.7          |
|     | 8. Is the triage area in the vicinity of key units (e.g. surgery, emergency, and intensive care)? | 1   | 1   | 4.5          |
|     | 9. Are there guidelines on decontamination in RTIs accompanied by chemical incidents? | 1   | 1   | 4.5          |
|     | 10. Is there an appropriate waiting area specified for injured patients and those who cannot move? | 1   | 1   | 4.5          |
|     | 11. Is a temporary morgue specified for keeping and transferring the bodies in regional RTIs with mass casualties? | 1   | 1   | 4.7          |
|     | 12. Are there sufficient dead body covers?                           | 1   | 1   | 4.5          |
|     | 13. Are there guidelines or policies for identifying casualties?     | 1   | 1   | 4.5          |
|     | **Safety and security**                                              |     |     |              |
|     | 1. Are the ambulance entrance/exit routes specified?                 | 1   | 1   | 4.5          |
|     | 2. Are measures taken to control the crowd and traffic around and inside the hospital, triaging area, emergency department, and wards? | 1   | 1   | 4.8          |
|     | 3. Are key areas, for example, triage, treatment, and disinfection areas, pre-specified? | 1   | .92 | 3.87         |
|     | 4. Are there security personnel and guards in sufficient numbers?   | 1   | 1   | 4.9          |
|     | 5. Is there an agreement with the police department or other security organizations when needed? | 1   | 1   | 4.7          |
|     | **Human resources management**                                       |     |     |              |
|     | 1. Is the emergency team sufficiently prepared for dealing with RTIs with mass casualties? | 1   | 1   | 4.7          |
|     | 2. Is a house physician specializing in emergency medicine present in the hospital? | 1   | 1   | 4.9          |
|     | 3. Are minimum needs of medical service providers and other personnel identified and satisfied for ensuring their effective performance in incidents? | .92 | .92 | 4.8          |
|     | 4. Are personnel welfare measures (e.g. commuting, child care, care at the time of illness, and disability of the personnel and their family members) taken? | .85 | 1   | 3.78         |
|     | 5. Are measures taken for the stress management of personnel, especially personnel of the emergency department? | .92 | .92 | 4.5          |
|     | 6. Are shift planning and rotation performed efficiently in order to reduce medical errors? | .92 | 1   | 3.69         |
|     | 7. Is a vaccination plan (against tetanus, hepatitis, and so on) planned for the emergency team in traumas? | .92 | 1   | 3.78         |
|     | 8. Is there a plan for providing and using extra and volunteer forces at the time of accidents? | .92 | .92 | 4.5          |
|     | 9. Is in-service training and practice seriously pursued for the personnel of the operating room, emergency department, and intensive care units in order to enhance hospital capacity and efficiency? | .92 | .92 | 4.5          |
|     | **Coordination and cooperation**                                      |     |     |              |
|     | 1. Are MOA signed with other organizations, for example, fire department, blood transfusion organization, and the police department, in order to provide medical services in RTIs with mass casualties? | 1   | 1   | 4.9          |
|     | 2. Are agreements signed with other hospitals in order to provide medical services in RTIs with mass casualties? | 1   | 1   | 4.8          |
|     | **Training and exercise**                                            |     |     |              |
|     | 1. Are official training programs held for personnel about RTIs with mass casualties and trauma care? | .92 | .92 | 4.7          |
|     | 2. Is the necessary training provided for personnel on their role and responsibilities in RTIs with mass casualties? | 1   | 1   | 4.9          |
|     | 3. Are theoretical and practical exercises performed for efficiently responding to RTIs with mass casualties (at least twice a year)? | 1   | 1   | 4.8          |
|     | 4. Are exercises performed in association with other involved organizations? | .92 | 1   | 4.5          |
|     | 5. Are there trauma-related quality improvement programs available?  | .92 | .85 | 4.7          |
|     | **Total score**                                                      | .97 | .98 | 4.6          |

CVR: content validity ratio; CVI: content validity index; RTIs: road traffic injuries; ICU: intensive care unit; ATLS: Advanced Trauma Life Support; ICS: incident command system; MOA: memorandum of agreement.
Table 2. Values of CVR, CVI, and impact score of items in the checklist of the specific resources and equipment of trauma patient management.

| No. | Resources and equipment                      | CVR | CVI | Impact score |
|-----|---------------------------------------------|-----|-----|--------------|
|     | Airway management                           |     |     |              |
| 1.  | Nasal airway                                | 1   | 1   | 5            |
| 2.  | Suction                                     | 1   | .92 | 4.8          |
| 3.  | Bag valve mask                              | 1   | 1   | 4.8          |
| 4.  | Trauma pack                                 | 1   | 1   | 4.5          |
| 5.  | Laryngoscope                                | 1   | 1   | 5            |
| 6.  | Tracheal tube                               | 1   | 1   | 4.9          |
| 7.  | Magill forceps                              | .92 | 1   | 4.9          |
| 8.  | Capnography                                 | .92 | 1   | 4.8          |
| 9.  | Stethoscope                                 | 1   | 1   | 3.87         |
| 10. | Oxygen                                      | 1   | 1   | 5            |
| 11. | Simple face mask                            | 1   | 1   | 5            |
| 12. | Syringe and needle                          | 1   | 1   | 5            |
| 13. | Chest tube                                  | 1   | 1   | 5            |
| 14. | Pulse oximeter                              | 1   | 1   | 5            |
| 15. | ABG                                         | 1   | 1   | 5            |
| 16. | Ventilator                                  | 1   | 1   | 5            |
| 17. | Equipment assessment checklist              |     |     | 3.87         |
|     | Circulation                                 |     |     |              |
| 1.  | Stethoscope                                 | 1   | 1   | 5            |
| 2.  | Sphygmomanometer                            | 1   | 1   | 5            |
| 3.  | Gauze and bandage wrap                      | 1   | 1   | 4.9          |
| 4.  | Crystalloid serum                           | 1   | 1   | 5            |
| 5.  | Peripheral venous catheter                  | 1   | 1   | 4.7          |
| 6.  | Urinary catheters                           | 1   | 1   | 5            |
| 7.  | Nasogastric tube                            | .92 | 1   | 3.69         |
| 8.  | Thermometer                                 | .85 | 1   | 4.7          |
| 9.  | Medical scale for emergency weight check    | .92 | 1   | 3.78         |
| 10. | Osteo-site bone biopsy needle               | .92 | 1   | 3.87         |
| 11. | Central venous catheter kit                 | 1   | 1   | 4.8          |
| 12. | Access to laboratory unit to check Hb, HCt test | 1 | 1 | 3.87 |
| 13. | Cardiac monitoring                          | 1   | 1   | 5            |
| 14. | Equipment assessment checklist              |     | .92 | 3.87         |
|     | Head, neck, and spinal cord trauma          |     |     |              |
| 1.  | Availability of neurosurgeon to emergency situation | 1 | 1 | 5 |
| 2.  | CT scan                                     | 1   | 1   | 4.7          |
| 3.  | MRI                                        | 1   | 1   | 4.5          |
| 4.  | Cervical collar                             | 1   | 1   | 5            |
| 5.  | Spinal backboard                            | 1   | 1   | 5            |
| 6.  | Possibility of craniotomy and brain surgery | 1   | 1   | 4.9          |
| 7.  | Possibility of advanced neurosurgery        | 1   | 1   | 4.7          |
|     | Limbs trauma                                |     |     |              |
| 1.  | Casts and splints                           | 1   | 1   | 4.8          |
| 2.  | Medical backboard                           | 1   | 1   | 4.8          |
| 3.  | Closed reduction of a fractured bone        | 1   | 1   | 4.8          |
| 4.  | Skeletal traction                           | 1   | 1   | 4.7          |
| 5.  | Skin traction                               | 1   | 1   | 4.7          |
| 6.  | Internal fixation                           | 1   | 1   | 4.5          |
| 7.  | External fixator                            | 1   | 1   | 4.5          |
| 8.  | Tendon repair surgery                       | 1   | 1   | 4.5          |
| 9.  | Portable and fixed radiography              | 1   | 1   | 4.8          |
| 10. | C-arm X-Ray machine                         | 1   | 1   | 4.5          |

Burns and wounds

(Continued)
important finding of the present study. Developing such a valid and reliable tool was conducted for the first time in the present research. Various tools have been designed for evaluating hospital preparedness in disasters and emergencies. Studies on hospital preparedness are generally focused on the use of the tool proposed by the WHO which is based on the “all hazards” approach and assesses the safety of hospitals in structural, non-structural, and functional dimensions. One limitation of this tool is the lack of measuring psychometric measures (reliability and validity criteria) for the tool.19,20 Another weak point is its inability to measure all structural, non-structural, and functional dimensions of hospital preparedness in disasters and emergencies.12 Studies have mostly focused on the structural and non-structural dimensions, neglecting functional ones.21 The present tool has focused on all three dimensions of preparedness and its subdimensions. This tool was designed based on nine dimensions of hospital preparedness, including command and control, infrastructure and medical equipment, information and communication systems, surge capacity, triage and medical services, safety and security, human resources management, coordination and cooperation, and training and exercise. The extracted dimensions are more expansive and precise than similar tools for evaluating hospital preparedness in RTIs with mass casualties, which was ignored in previous tools. The presence of these resources and equipment in hospitals is essential for managing trauma patients and affects hospital preparedness for managing injury cases in RTIs with mass casualties.

In the present tool, items such as designing, reviewing, and notifying the response plan for RTIs; attainment of financial resources; and appropriate organizing by Activation of the incident command system (ICS) are also included. Considering the importance of intra- and inter-organizational coordination and collaboration, necessity of focusing on information and communication systems and promoting cooperation with supportive units were supposed as the other criteria for evaluating hospital preparedness in RTIs.

Limitations
The current tool does not take into account all aspects of hospital preparedness, for example, the hospital’s preparedness for structural safety has not been evaluated, but with expert advice, all aspects of preparedness associated with road traffic accidents have been extracted.

Conclusion
Findings showed that the tool has sufficient reliability and validity for evaluating hospital preparedness in RTIs with
mass casualties. Assessing hospital preparedness can inform policymakers, planners, managers, and hospital staff about their current preparedness status. In addition, hospital preparedness assessment can lead to the identification of weaknesses which may be covered by improving hospital capacities for effective response at the time of emergencies and disasters. The provision of specialized and efficient human resources, stress management strategies, continuous education, and exercises for promoting the preparedness of staff can be considered as important factors for successful performance at the time of emergencies and disasters. The existence of a standard triage system and relevant guidelines, establishment of infrastructures and medical equipment and tools required in RTIs, familiarity with and use of various techniques for enhancing capacity, and effective assessment and evaluation of resources and facilities can be assumed as other important factors for hospital preparedness.

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