ORIGINAL ARTICLE

WHAT ARE WE DOING FOR INJURIES? THE BURDEN AND LEVEL OF PREPAREDNESS FOR MASS EMERGENCIES IN KHYBER PAKHTUNKHWA PROVINCE OF PAKISTAN

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Background: Injuries are one of the highly prevalent public health problems of Pakistan but still we are unable to develop a mechanism for its quantification and management. To understand the reasons of not doing so we need detailed discussion among the leaders of different stakeholders working in area of injuries. In this study, a focus group discussion (FGD) of provincial health leaders was conducted to explore challenges and gaps and identify opportunities for quantification and management of injuries in the province of Khyber Pakhtunkhwa (KP). **Methods:** This was a descriptive qualitative study conducted in Khyber Medical University, Peshawar, Pakistan. Study participants were policy makers, academia, senior level health mangers and representatives from international organizations. Purposive sampling was applied to select respondents for FGD from relevant areas to capture diversity of opinions among participants. The data were transcribed verbatim and analyzed thematically through open-coding process. **Results:** One FGD was conducted in this study with a total of 11 participants. The study participants identified a number of challenges and gaps regarding quantification of injuries' burden in KP province of Pakistan and preparedness of existing health system to cope with mass emergencies. The discussion yielded four areas of detailed discussion which are; developing a surveillance system for injuries, capacity of District Health Information System, existing level of preparedness at provincial and district level and suggestions for improvement of existing situation with plans for capacity improvement. **Conclusions:** In countries like Pakistan routine health information system is the better option for quantification of injuries' burden, but needs review of existing indicators and sheer commitment from field level to higher authorities with due consideration of technology assimilation. A multipronged approach is required for preparedness including; trainings on emergency medicine and skills, incentives for staff to fill vacant posts, well equipped ambulances and provision of other supplies on regular basis.

Keywords: Injuries; Focus Group Discussion (FGD); Health information system; Surveillance system; Preparedness.

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INTRODUCTION

Traumatic injuries have progressively increased during the last two decades and have become a leading public health issue around the globe.[1] In developing countries, injury is an ignored epidemic and the customary interpretation of injuries as "accidents" or random events is the major cause of historical neglect to this part of public health.[2] Although, global rates and trends have shown improvements but yet a lot to do in this area. In divergence with global trends for NCDs, both comparative positions and age-standardized YLD (Years Lived with Disabilities) rates have decreased for most types of injuries. in 2005, falls were the 13th leading cause of disability and has reached down to the 15th rank, and age-standardized YLD rates also decreased (8·58% [5·23–12·2%]). Similarly, other unintentional injuries decreased in global rank from 27th in 2005 to 34th in 2015.[3] A study on Global Burdon of Disease (GBD) in 2013 shows the estimates, that 973 million (uncertainty interval (UI) 942–993) people sustained injuries that warranted some type of healthcare and 4.8 million (UI 4.5–5.1) people died in result of these injuries. The same study provided regional and global estimates for 28 causes of injury in 187 countries of 21 world regions from 1990 to 2010, but it was generalized study and injuries were not specially focused.[4] According to a press release of World Health Organization in March 2016, the unintentional injuries such as road traffic deaths cause 1.7 million deaths annually. Similarly,

intentional injuries such as suicides result in 246,000 deaths annually.[5]

Road traffic accidents, injuries and resulting deaths occur mostly in poorer countries, where vulnerability level is high and preventive efforts are mostly missing in low and middle-income states and health-care systems are least organized to meet the challenges.[6]

The public health significance of injuries has been highlighted in few studies conducted in Pakistan.[7] In-depth data on epidemiology of injuries are hard to find as there is under-reporting on different types of injuries.[8] Available data proves that motor vehicle injuries, homicides, assaults, poisonings and firearm injuries are the major forms of injuries taking place in Pakistan.[9] An information system is needed in Pakistan to monitor trends and developments in injuries, appraise its true impact and develop safety standards on national and provincial levels. Though some studies are available but they have focused a single pattern of injuries mostly.[10–12]

Khyber Pakhtunkhwa (KP) is one of the five provinces of Pakistan. It is situated in North West region of the country with 27,932 thousand inhabitants and share borders with Afghanistan and Russia. Situation of data availability on injuries in KP province of Pakistan is more or less the same as rest of the country. Being a prime victim of terrorism since more than a decade due to its geopolitical position, the injuries are mostly those resulting from bomb blasts and firearm.[13]The hospitals of province are at all the time under threat of loads of mass casualties. This predisposition calls for a quantification of burden of injuries and a marked level of preparedness for coping with such emergencies.

For the last few decades, injuries are one of the highly prevalent public health problems of Pakistan but still we are unable to develop a mechanism for its quantification and management. To understand the reasons of not doing so we need detailed discussion among the leaders of different stakeholders working in the area of injuries. After the 18th amendment in the constitution of Pakistan[14], health is no more a national subject and each province is responsible for developing its own polices. In this study, we have conducted a focus group discussion of the provincial health leaders (policy makers, academics, health managers, in charge hospital emergency units, national and international organizations, WHO and other UN agencies) to explore challenges and gaps and identify opportunities for quantification and management of injuries in the province of KP.

MATERIAL AND METHODS

This was a descriptive exploratory study, using qualitative approach. The study was conducted in Khyber Medical University (KMU), Peshawar-Pakistan during a parallel session of "The 7th Annual Research conference" on 7th May, 2016. The theme of this conference was "triple burden triple response" i.e., communicable diseases, non-communicable diseases and injuries. Respondents were selected through purposive sampling to capture diversity of opinions about the current status of "injuries" in province and to reach some valuable decisions about its institutionalization.

The focus group comprised of policy makers, academics from KMU and Agha Khan University (AKU), executive level health managers including representatives from emergency department of Lady Reading (LRH) and Khyber Teaching Hospitals (KTH), Health Directorates of KP and FATA. Apart from them, representatives from relevant departments United Nation organizations such as WHO, UNICEF and WFP were also included. This made a purposive sample of total 11 participants.

Two broad and loosely woven questions were asked from all the participants. Focus group discussion was recorded and transcribed verbatim by researchers. During and upon completion of interviews, reflective notes and memos were taken. The resulting transcripts were coded by all the authors. We used open-coding of transcripts to identify significant key words, phrases, and statements. Without any preconceived assumptions, the researchers observed data analytically in initial coding process. From consequent stages of iterative readings and axial coding, common themes developed. This study was approved by the ethical review committee of KMU.

RESULTS

The findings of this inquiry are presented under four distinct themes. Initial two themes encompass the response of participants regarding quantifying the burden of injuries, whereas the last two themes focus the preparedness of existing health system in regard to mass emergencies and strategies for distribution of burden from the center to districts, a usual dilemma.

Theme 1: Developing a Surveillance System for injuries

The focus group participants reported a diverse range of ideas regarding development of a surveillance system for injuries or improving the quality and more scientific use of data coming from the existing reporting system; District Health Information System (DHIS).

Injuries of different types ranging from road traffic injuries to mass emergencies resulting from diverse calamities are regularly being reported to the health system of KP. The province is extremely prone to manmade emergencies, being a center of conflict due to its geographical and strategic location and along with that natural disasters like floods and earthquakes are also at its peak since last almost a decade. Most of the participants expressed their worry about the huge and progressively increasing burden of injuries at different districts of KP and specifically the tertiary care hospitals of Peshawar, the capital.

"We have routine patients coming to us like road traffic accidents, fire arm injuries, earth quakes and floods, and apart from that patients coming for dehydration and interestingly we are getting patients coming with dog bites and rat bites these days. We have more than ninety thousand patients coming to us per month in emergency." (R-1)

There was a consensus among participants that for injuries in Pakistan there is no satisfactory response system. This concern can only be addressed by a designated system for injuries.

"We should have a system for injuries and for the existing conditions we don't have one." (R-4)

Participants reported a mixed type of feelings and responses regarding establishment of a surveillance system for injuries and it was noticed that some later responses were drawn towards the existing generalize system of reporting, DHIS, by the reiteration and vigor in the utterance of earlier respondents.

"Actually, we have the district health information system and it is very flexible. If we need any information to put in, which we think to include in that we can do that." (R-3)

"We can't have a parallel system of reporting for injuries only, for the whole province (with an expression of dislike at this instance i.e. against any other new system)." (R-2)

However, most of the participants expressed their feelings that the available data is of extremely poor quality and cannot serve the purpose of quantifying burden and planning accordingly. To overcome the issue either we need a dedicated surveillance system for injuries or strengthen the HIS.

"We do not have very good data on it we do not follow the SOPs and………there is no documentation of that so we need to develop this data." (R-7)

"There is no data, a refined collection of data and correction of data is needed and then securing it." (R-8)

Participants pointed out that all headquarter hospitals and tertiary hospitals of Peshawar should be involved in reporting loop. Similarly, there is a need to take different entities into account like industries' hospitals for work injuries, 1122 emergency service and police department. Therefore, a collaborative system needs to be established which keeps regular liaison with these departments for data collection.

"If we say DHIS, that is not collecting data from hospitals while injuries are mostly reporting to hospitals and very scarce reporting to Basic Health Units. For the surveillance of injuries and data collection on injuries, we need to go to hospitals, casualties should be specially included. Similarly, industries have to be encircled which have their own hospitals, Police is to be covered, 1122, the emergency service as well." (R-6)

Theme II: The capacity of District Health Information System (DHIS)

DHIS is a central system of data collection on different health indicators and till 18th amendment it was following similar formats throughout Pakistan. After the devolution, now every province can bring in changes in the system, from formats to software as per their need.

The participants reported that only 2 indicators for injuries are available in this system i.e. "road traffic accidents" and "burns" which are obviously not good representative of data. Most of the participants opined to review the existing indicators of DHIS instead of a new system.

"We already have a system, we need to strengthen it and we need a segregation of data. We can add further indicators to it and we can build on that a thing." (R-2)

"Similarly, DHIS, yes there are limitations in it but we can easily add other things which can easily be handled" (R-5)

Participants reported that Emergency patients including injuries almost always prefer to come to the tertiary care hospitals. Unfortunately, tertiary hospitals are not reporting to DHIS and we are clearly missing most of our data rendering the original burden of injuries unnoticed.

"Data should be added up in DHIS in all the emergency wards also and emergencies." (R-5)

"For the surveillance of injuries and data collection on injuries, we need to go to hospitals, casualties should be specially included." (R-6)

DHIS being an important part of the health system is functional for more than a decade in the province but still the program is not implemented in its true spirit. It's unfortunate that DHIS is still an Annual Development Program (ADP) scheme and not part of the regular budget, shows a sense of triviality towards this system. Regular and periodic review meetings of districts for data validation, monitoring visits of field offices, trainings of staff and dedication of staff only to DHIS activities are such factors which can really strengthen it.

"If you properly implement this health information system, DHIS and if we follow the ICD 10-coding all this problem is solved whether communicable or non-communicable or anything." (R-4)

"And we put a little more effort in the efficiency of DHIS reporting and that would be like further strengthening of our district health system." (R-2).

Theme III: Existing level of preparedness at Provincial & District level

One of the focuses of the discussion was to elaborate the existing preparedness of provincial and district setups and explore elements required for distribution of burden from provincial tertiary care hospitals.

The three major tertiary care hospitals of KP situated in Peshawar are catering patients from all over the province and even Afghanistan. It is observed that people of the districts have a blind trust on these hospitals and a reasonable disbelief on the district setups. The participants representing LRH and KTH expressed a reasonable degree of satisfaction from their hospitals but managers from directorate admitted weaknesses at district level.

"We have mass emergency management units in tertiary care hospitals while at district level we have emergency departments but they mostly do a first aid and a little more than first aid may be, then they refer it for the specialized care to tertiary care hospital." (R-2)

" Well regarding Khyber Teaching Hospital, we are a bit prepared for any type of disasters. As we are taking the 1/10th of the burden of LRH." (R-4)

Participants reported that sensing the overburdened provincial health system we have taken some practical steps like special incentive packages for doctors who will work at districts. Further mass emergency units like LRH will be developed at divisional level catering patients from different districts at one divisional hospital and this will surely reduce burden from center.

"We have many priorities and this also includes……bringing these services, the specialized services down to the regional head quarter level. This will decrease burden on the provincial headquarters." (R-2)

"Recently government has increased pays and incentives of those doctors who are working in districts especially in the far-flung areas so that they remain in those districts." (R-5)

According to participants, unluckily the basic steps of "Golden Hour" are mostly not followed properly at district level resulting in an undue burden at provincial hospitals. Participants reported that at least some of the basic facilities in the form a cardiovascular, orthopedic and general surgery unit should have been established at district headquarter hospitals so that patient could be stabilized over there before shifting to major hospitals.

"When patient is shifted make sure that he had two wide bore IV lines and all the IV drip set and blood. So, we need to make a protocol, how to transfer patient from one place to another. Make sure that he is stable enough to be shifted to the health care facility." (R-1)

"You cannot shift a patient who is unstable by which I mean is in shock or is bleeding inside. For that I think we need to develop certain units at district level like surgical, orthopedic, cardiothoracic and cardiovascular." (R-3)

Theme IV: Suggestions for improvement of existing situation

For reducing the burden of injuries at central level of KP, it is necessary to fill all vacant posts of doctors and paramedics at district level and increasing the number if not enough for that respective population. All the basic equipment and medicines should be provided to district hospitals to deal with emergencies, including special surgical kits for Hepatitis B & C positive patients as its been observed that such patients are referred to provincial setups for even minor emergency procedures.

"At the district level we got casualty department, we got hospitals and everything but first we have to fill in the gaps like, is HR available there? If we don't have a proper doctor there, a trained doctor, with the training in emergency how we control those people coming from the district." (R-5)

"We receive patients at LRH from larger districts like Charsadda and Mardan even, simple orthopedic patient which may be dealt at local level, but sent for the reason that they are either hepatitis B or C positive. (R-1)

Participants reported training deficiency of Staff at district level including doctors and paramedics. Short courses and refresher courses on ACLS (Advance Cardiovascular Life Support), BLS (Basic Life Support), CPR (Cardio-Pulmonary Resuscitation) and First Aid training are very much needed periodically for the staff. Every ambulance should be provided a regular paramedic and this team must also be trained on emergency management.

"We even need to train those drivers we need to train those medical attendants working with those drivers." (R-5)

Participants suggested a team approach on regular basis for management of emergencies, a team comprising of doctor and an administrative fellow and assignment of beds for which they will be responsible in all aspects.

"Dealing with mass emergencies, two type of doctors come in contact, i.e., clinical and administrative doctors. Most of the time you have the staff but even at LRH, the largest hospital you don't have the endotracheal tube or things like that. So, I just want to specify that we need to make teams who are responsible for their beds." (R-1)

During discussion the participants pointed out establishment of a department of emergency medicine in KP hospitals on the analogy of department of

emergency medicine from a well reputed local or international organization which has developed a curriculum for an approved degree. This initiative will need a detailed workout which is not possible at once. But the purpose of discussing it here was to sensitize the authorities.

"One more thing which I saw in the system of AKU, there are fellows of CPSP doing FCPS in emergency medicine, but we don't have any such provision." (R-6)

Table-1: Summary of major themes emerged from focus group discussion

Themes	Codes	Relevant quotation
Developing a Surveillance System for injuries	16	"We should have a system for injuries and for the existing conditions, we don't have one." (R-4)
The capacity of District Health Information System (DHIS)	19	"If you properly implement this health information system; DHIS and if we follow the ICD 10-coding, this problem is solved whether communicable or non-communicable or injury." (R-4)
Existing level of preparedness at Provincial & District level	15	"We have mass emergency management units in tertiary care hospitals while at district level we have emergency departments but they mostly do a first aid and a little more than first aid may be, then they refer it for the specialized care to tertiary care hospital." (R-2)
Suggestions for improvement of existing situation	18	"If we don't have a doctor in periphery, a doctor trained in emergency medicine, how we control those people coming from the district to tertiary care." (R-5) "We even need to train those drivers and medical attendants working with those drivers." (R-5)

DISCUSSION

This study has revealed potential challenges in health system and prospects that need to be considered for quantifying the burden of injuries in Khyber Pakhtunkhwa province of Pakistan and assessing the existing preparedness of provincial and district setups with exploration of elements required for distribution of burden from the provincial tertiary care hospitals. The discussion with participants yielded four areas of detailed discussion which are; developing a surveillance system for injuries, capacity of DHIS, existing level of preparedness at provincial and district level and suggestions for improvement of existing situation and plans for capacity improvement.

We noticed a mix of opinions about the development of either a distinct surveillance system for injuries or improving quality of existing reporting through HIS. A comprehensive surveillance system for injuries will not only give us a true picture of burden but will also help us better management of the problem. The participants argued that injury surveillance is need of the day but not a practical solution for countries like us because of scarce resources. Due to increasing drift of injuries as serious contributors to morbidity and mortality, injury surveillance systems in developing countries are indispensable. But in developing countries, injury prevention is still lagging behind the scope of public health programs.[15] Injury related data are easily available in developed countries through vital statistics, hospital discharge summaries, and dedicated health survey data. While in developing countries, due to insufficient infrastructures and resources, these sources may not be practical for a variety of medicolegal, economic, and administrative reasons.[16,17] The participants who proposed a surveillance system for injuries, pointed out that a major challenge would be involvement of rescue 1122 service and police department. Being major sources of information regarding injuries they are presently not covered in any type of reporting systems. The participants agreed upon the initiation of such a surveillance system which could systematically encompass all the relevant entities. As proposed by Haagsma *et al*; for the estimation of deaths from road injury, self-harm and interpersonal violence Police and crime reports are the best data sources used in different countries.[4]

Most participants were in favor of improving the DHIS for which a prerequisite is to extend the system to tertiary care hospitals as for now tertiary hospitals are not reporting on DHIS tools and majority of the caseload for injuries are dealt by these hospitals. Continuing hospital-based injury surveillance signify effective mean of calculating the burden, necessary for designing evidence-based prevention programs.[17] The participants argued that DHIS is a flexible system which can accommodate addition of new indicators for recording of injuries data but for quality data generation, the staff in hospitals must be compelled by a system of rewards and punishments. HIS of Rwanda has also tried to revise and review the indicators list with the help of an expert's team to incorporate new indicators as per need of health department.[18] Strengthening of HIS is a must, not only for injuries quantification but for the overall health care reporting and subsequent betterment.

Regarding preparedness of the provincial and district health system for mass emergencies, no doubt the three tertiary care public hospitals in Peshawar are providing best possible services in their available resources to the whole population of KP province. But regarding district health systems, the health directorate managers admitted some bare weaknesses. Most

academic hospitals provide a reasonable level of emergency care but district hospitals often deficient in trained staff, suitable infrastructure, and stock of consumables.[19] The participants reported that sensing the overburdened provincial health system, some practical steps are taken and some are in pipeline for the improvement of district health systems. These include; special incentives for staff at districts, replication of services at district setups and development of mass casualty systems at divisional levels on the analogy of LRH. Unfortunately, basic steps necessary in "golden hour" are mostly not followed properly at district level causing an undue burden at provincial hospitals. Participants reported that at least some of the basic facilities are needed at district headquarter hospitals for stabilizing patients over there before shifting to major hospitals. A qualitative study of 21 hospitals in seven developing countries reported that poor triage of received patients and insufficient provision of emergency care endangered the lives of arriving patients.[20] Hundreds of people, dignitaries and media personnel come to see the patients at the same time during emergencies. For such situations there must be some Standard Operating Procedures allowing doctors and paramedical staff to move around conveniently and take the best care of patients.

Participants reported that Short courses and refresher courses on ACLS (Advance Cardiovascular Life Support), BLS (Basic Life Support), CPR (Cardio-Pulmonary Resuscitation) and First Aid training are very much needed periodically for the staff at districts. This will lessen reasonably the burden from the center provided that basic equipment and medicines are also available at the district setups. Similar deficiencies in trainings are reported in other developing countries.[21] Likewise for avoiding fatality through shifting of patients to higher facilities of center, the ambulance services should also be overviewed. Every ambulance should be provided a regular paramedic team, trained on emergency management.[22] Participants suggested a team approach on regular basis for management of emergencies with one member being the clinical doctor and the other member being administrative doctor or other personnel related to administration.

Practical solutions and suggestions were also surfaced through the end of this study. Participants agreed upon adoption of a national or international model for emergency management and consequent training of staff on that model. According to a study in turkey; a training program in Turkey on emergency medicine was implemented to improve the uniform and reliable knowledge and skill set among general practitioners working in Turkish emergency departments.[23] Moreover, it was pointed out that AKU Karachi is the only university hospital in Pakistan which offers member and fellowship degrees in emergency medicine. To address the acute shortage of specialist in emergency medicine other emergency departments should be enabled to start postgraduate degree programs. Such an initiative is taken by health system of Ghana in 2009.[24] This is of course a time-consuming exercise with lots of homework needed but authorities were successfully sensitized on the idea at this platform.

This study is the first of its kind conducted in the country regarding "injuries" in which policy makers, senior level managers, academia and representatives from international organizations sat together to develop consensus and roadmap about different aspects of the issue. However, this was one FGD with senior authorities, similar open-ended studies with field level medics and paramedics may give us further useful directions in coping with the issue of injuries. For exploring the challenges and opportunities for improvement in country's health system with a focus on injuries and emergency management further qualitative and quantitative research is indispensable.

CONCLUSION

For quantification of injuries' burden, a robust surveillance system is the best approach in resource abundant health systems but in countries like Pakistan; surveillance system will come across sustainability issues among many others. Routine health information system is the better option, if not the only one, for the current issue but needs a holistic approach with sheer commitment and due consideration of technology assimilation.

District health systems need special attention in terms of preparedness for mass emergencies if we aim to divert the burden from tertiary care hospitals at capital. A multipronged approach is required including; trainings, incentives for staff to fill vacant posts, ambulances and provision of other supplies on regular basis. For training of medics and paramedics on emergency medicine and skills, support can either be acquired from Agha Khan University or other national and international donor agencies. Once the district health systems are established, media campaigns can be organized locally to build the trust and faith of communities on their own hospitals instead of coming to central hospitals.

Ethical Approval: The study is approved by the ethical review committee of KMU.

Consent for publication: Not Applicable.

Availability of data and materials: Though all the data in form of words uttered by participants is available here in this study but the original transcript and coding process are available from the corresponding author on reasonable request.

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AUTHORS' CONTRIBUTION

FA: Conducted FGD: Analyze data and wrote manuscript. ZUH: Conceptualize the main idea and reviewed manuscript. DM: Supervised analysis. MSHQ: Transcript preparation. SIAS & ZK: Helped in analysis and manuscript writing

REFERENCES

1. Ferguson DO. Public Health Strategies for Strengthening Prehospital Injury Responses in St. Lucia: Walden University; 2018.
2. Gosselin RA, Spiegel DA, Coughlin R, Zirkle LG. Injuries: the neglected burden in developing countries. Bull World Health Organ 2009;87(4):246–a.
3. Vos T, Allen C, Arora M, Barber RM, Bhutta ZA, Brown A, *et al.* Global, regional, and national incidence, prevalence, and years lived with disability for 310 diseases and injuries, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015. Lancet 2016;388(10053):1545–602.
4. Haagsma JA, Graetz N, Bolliger I, Naghavi M, Higashi H, Mullany EC, *et al.* The global burden of injury: incidence, mortality, disability-adjusted life years and time trends from the Global Burden of Disease study 2013. Inj Prev 2016;22(1):3–18.
5. WHO. An estimated 12.6 million deaths each year are attributable to unhealthy environments (News release) [Internet]. 2016 [cited 2016 Jun 12]. Available from: http://www.who.int/mediacentre/news/releases/2016/deaths-attributable-to-unhealthy-environments/en/
6. WHO. World health statistics 2016: monitoring health for the SDGs sustainable development goals: World Health Organization; 2016.
7. Nishtar S, Bile KM, Ahmed A, Amjad S, Iqbal A. Integrated population-based surveillance of noncommunicable diseases: the Pakistan model. Am J Prev Med 2005;29(5 Suppl 1):102–6.
8. Sriram V, Gururaj G, Razzak JA, Naseer R, Hyder AA. Comparative analysis of three prehospital emergency medical services organizations in India and Pakistan. Public Health 2016;137:169–75.
9. Ghaffar A, Hyder AA, Mastoor MI, Shaikh I. Injuries in Pakistan: directions for future health policy. Health Policy Plan 1999;14(1):11–7.
10. Fayyaz J, Wadhwaniya S, Shahzad H, Feroze A, Zia N, Mir M, *et al*. Pattern of fall injuries in Pakistan: the Pakistan National Emergency Department Surveillance (Pak-NEDS) study. BMC Emerg Med 2015;15(Suppl 2):S3.
11. Khan UR, Bhatti JA, Shamim MS, Zia N, Razzak JA, Jooma R. Clothing-related motorcycle injuries in Pakistan: findings from a surveillance study. Int J Inj Contr Saf Promot 2015;22(4):308–13.
12. He S, Lunnen JC, Zia N, Khan U, Shamim K, Hyder AA. Pattern of presenting complaints recorded as near-drowning events in emergency departments: a national surveillance study from Pakistan. BMC Emerg Med 2015;15(Suppl 2):S4.
13. Khan I, Khan N, Naeem R, Kerai S, Allen K, Zia N, *et al*. Bomb blast injuries: an exploration of patient characteristics and outcome using Pakistan National Emergency Departments Surveillance (Pak-NEDS) data. BMC Emerg Med 2015;15(Suppl 2):S7.
14. Shah A. The 18th Constitutional Amendment: Glue or solvent for nation building and citizenship in Pakistan? Lahore J Econ 2012;17:387.
15. Ezenkwele U, Holder Y. Applicability of CDC guidelines toward the development of an injury surveillance system in the Caribbean. Inj Prev 2001;7(3):245–8.
16. Smith GS, Barss P. Unintentional injuries in developing countries: the epidemiology of a neglected problem. Epidemiol Rev 1991;13(1):228–66.
17. Schuurman N, Cinnamon J, Walker BB, Fawcett V, Nicol A, Hameed SM, *et al.* Intentional injury and violence in Cape Town, South Africa: an epidemiological analysis of trauma admissions data. Global Health Action 2015;8:27016.
18. Mutale W, Chintu N, Amoroso C, Awoonor-Williams K, Phillips J, Baynes C, *et al.* Improving health information systems for decision making across five sub-Saharan African countries: Implementation strategies from the African Health Initiative. BMC Health Ser Res 2013;13(Suppl 2):S9.
19. Das AK, Gupta SB, Joshi SR, Agarwal P, Murmu LR, Bhoi S, *et al.* White paper on academic emergency medicine in India: INDO-US Joint Working Group (JWG). J Assoc Physicians India 2008;56:789–98.
20. Razzak JA, Kellermann AL. Emergency medical care in developing countries: is it worthwhile? Bull World Health Organ 2002;80(11):900–5.
21. Ramanujam P, Aschkenasy M. Identifying the need for pre-hospital and emergency care in the developing world: a case study in Chennai, India. J Assoc Physicians India 2007;55:491–5.
22. Thakore S, Morrison W. A survey of the perceived quality of patient handover by ambulance staff in the resuscitation room. Emerg Med J 2001;18(4):293–6.
23. Bellows JW, Douglass K, Atilla R, Smith J, Kapur GB. Creation and implementation of an emergency medicine education and training program in Turkey: an effective educational intervention to address the practitioner gap. Int J Emerg Med 2013;6(1):29.
24. Martel J, Oteng R, Mould-Millman NK, Bell SA, Zakariah A, Oduro G, *et al*. The development of sustainable emergency care in ghana: physician, nursing and prehospital care training initiatives. J Emerg Med 2014;47(4):462–8.

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