

Rehabilitation lessons from the 2005 Pakistan earthquake and others since — looking back and ahead?

Farooq Azam Rathore,¹ James Gosney²

Oct 2015 marks the 10th anniversary of a great national tragedy, which still haunts many of the victims and many of those who provided them health care assistance during this difficult time. It is appropriate now to revisit the 2005 Pakistan Earthquake and others to review their lessons in order to better respond to future large-scale natural disasters.

A disaster is defined as "a sudden, calamitous event that seriously disrupts the functioning of a community or society and causes human, material, and economic or environmental losses that exceed the community's or society's ability to cope using its own resources".¹ Natural disasters include earthquakes, forest fires, droughts, volcanic eruptions, tornadoes, hurricanes, tsunami and floods. In the last two decades, earthquakes (some resulting in tsunamis) killed more people than all other types of disaster combined, claiming nearly 750,000 lives.²

Lessons learned from these tragedies, including those from the 2005 Pakistan Earthquake, are found in the pool of knowledge reflected in the growing global disaster literature.³⁻⁵ Preparedness for and response to these disasters has consequently improved. The disaster rehabilitation responses to subsequent earthquakes in China (2008), Haiti (2010) and Nepal (2015) have been quicker, better coordinated, and more integrated into the overall emergency disaster response.

Large numbers of severe neurological and orthopaedic impairments have been documented in earthquakes around the globe including the 2005 earthquake over the last ten years. Spinal cord injuries (SCI),⁶ traumatic brain injury (TBI),⁷ limb amputation,⁶ and peripheral nerve injuries are among them. Historically, the emergency medical response to a disaster has been led by surgeons whose priority is saving lives and limbs. Fortunately, there is increasing global awareness that early rehabilitation

intervention for these severe injuries results in positive outcomes including reduced associated disability demonstrated by fewer acute and long-term complications, decreased length of hospital stay, improved functional outcomes, and better community re-integration of survivors.^{8,9} Inclusion of physical rehabilitation as part of 'injury' essential health services in the most recent version of the Sphere Handbook¹⁰ and inclusion of minimum standards for rehabilitation in the World Health Organisation guidance for foreign medical teams,¹¹ reflects this increased awareness.

Rehabilitation medicine physicians (i.e., physiatrists) have not only played an active role in the early management of these major disabling injuries, but have also devised long-term rehabilitation and follow-up plans.¹² Benefits of physiatrist involvement were highlighted in a seminal ISPRM (International Society of Physical and Rehabilitation Medicine) discussion paper on the effectiveness of medical rehabilitation after natural disasters. This academic collaboration between experts from four countries summarized the literature on the demographics of major disabilities in natural disasters, shortcomings in the traditional disaster response, the value of an early multi-disciplinary rehabilitation intervention, and the need for long-term patient follow up.¹³

Physiatrists actively participated in the emergency medical response to the Sichuan earthquake (China; 2008) in which they performed triage, coordinated the transfer of SCI patients, performed early evaluation, initiated rehabilitation, developed follow up plans, and assessed quality of life (QOL) of the survivors.^{12,14} Physiatrists and other rehabilitation professionals from the US and Canada heavily supported the nearly non-existent rehabilitation infrastructure in Haiti following the 2010 earthquake, reinforcing the significant role of physiatrists in the management of severe disabling injuries post disaster.¹⁵ The recent earthquake in Nepal saw a near-immediate disaster rehabilitation response.³ Physiatrists and medical professionals with disaster rehabilitation expertise from Canada, US, UK, Pakistan, Bangladesh and Australia conducted case video

¹Department of Rehabilitation Medicine, CMH Lahore Medical College and Institute of Dentistry, Lahore, Pakistan, ²Committee on Rehabilitation Disaster Relief (CRDR), International Society of Physical and Rehabilitation Medicine (ISPRM) Rue François-Versonnex, 7 1207 Geneva Switzerland.

Correspondence: Farooq Azam Rathore. Email: farooqrathore@gmail.com

conferencing and provided mentorship to the medical professionals who were providing rehabilitation services to the surge of acute SCI patients at the Spinal Injury Rehabilitation Centre near Kathmandu.

These major earthquakes of the last decade have imparted several valuable lessons regarding medical rehabilitation in disasters which deserve highlighting:

1. Earthquakes cause large numbers of severe neurological and orthopaedic impairments which can result in long-term disability;
2. These disabling injuries require acute trauma care as well as sub-acute, intermediate, and long-term rehabilitation in order to optimize functional recovery and community re-integration of survivors;
3. Rehabilitation is most effective when initiated early after the disaster, and;
4. Medical rehabilitation following a disaster is best provided by a well-trained, multi-disciplinary team of rehabilitation professionals led by physiatrists.

Pakistan's health care system responded well despite its limitations during the acute response to the October 2005 earthquake, particularly for SCI patients. Most victims were efficiently triaged and received adequate initial assessment and treatment by rehabilitation professionals.³ These initial positive patient management measures resulted in increased societal and professional awareness of SCI, which has been historically neglected in Pakistan. SCI facilities at the National Institute of Rehabilitation Medicine and Armed Forces Institute of Rehabilitation Medicine were upgraded; training opportunities for PMR and other rehabilitation professionals were improved, and; data sharing and publications on disaster populations increased as did international collaborations.

There presently remains, however, a critical need for stakeholders across the spectrum of emergency management in Pakistan, including the medical and rehabilitation sectors, to develop comprehensive, integrated response plans in preparation for the next major large-scale disaster. Professional societies of PMR and those of other specialties practicing rehabilitation, including orthopaedics, neurosurgery, and neurology, must actively participate. National and provincial disaster management plans should consider:

1. Physiatrist involvement in emergency triage, evacuation, and assessment of victims with new onset injuries as well as those with pre-existing disabilities;

2. Practice of multidisciplinary team rehabilitation (as rehabilitation is still commonly perceived as physiotherapy with exercises), and;

3. Expanding rehabilitation capacity in disasters by training surgeons on integrating rehabilitation into acute trauma care and general practitioners on performing basic rehabilitation triage and interventions. The physiatrist work force can be increased in anticipation of disasters by expanding and upgrading PMR training programmes.

The 2005 earthquake was a challenge to which the Pakistani nation and its health care professionals responded admirably despite limitations. Early, coordinated intervention by multidisciplinary rehabilitation teams had a positive impact on survivor recovery. It is imperative that the lessons learnt from this tragedy guide our present planning in order to prevent needless mortality, suffering, and disability in future disasters.

Conflict of interest: Author declares no conflict of interest.

Funding disclosure: Nil

References

1. International Federation of Red Cross and Red Crescent societies. What is a disaster? - IFRC. Cited 2015 August 12. Available from URL: <https://www.ifrc.org/en/what-we-do/disaster-management/about-disasters/what-is-a-disaster/>.
2. Centre for Research on the Epidemiology of Disasters - CRED. Report on Human cost of Natural Disasters. A global perspective 2015. Cited 2015 August 12. Available from URL: http://cred.be/sites/default/files/The_Human_Cost_of_Natural_Disasters_CRED.pdf.
3. Rathore FA, Farooq F, Muzammil S, New PW, Ahmad N, Haig AJ. Spinal cord injury management and rehabilitation: highlights and shortcomings from the 2005 earthquake in Pakistan. *Arch Phys Med Rehabil*. 2008; 89: 579-85.
4. Sheppard PS, Landry MD. Lessons from the 2015 earthquake(s) in Nepal: implication for rehabilitation. *Disabil Rehabil* 2015 13:1-4[Epub ahead of print]
5. Gosney JE, Reinhardt JD, von Groote PM, Rathore FA, Melvin JL. Medical rehabilitation of spinal cord injury following earthquakes in rehabilitation resource-scarce settings: implications for disaster research. *Spinal Cord*. 2013; 51: 603-9.
6. Mallick M, Aurakzai JK, Bile KM, Ahmed N. Large-scale physical disabilities and their management in the aftermath of the 2005 earthquake in Pakistan. *East Mediterr Health J* 2010; 16: S 98-105
7. Bhatti SH, Ahmed I, Qureshi NA, Akram M, Khan J. Head trauma due to earthquake October, 2005 - experience of 300 cases at the Combined Military Hospital Rawalpindi. *J Coll Physicians Surg Pak* 2008; 18: 22-6.
8. Reinhardt JD, Li J, Gosney J, Rathore FA, Haig AJ, Marx M, DeLisa JA. Disability and health-related rehabilitation in international disaster relief. *Glob Health Action* 2011; 4: 7191. doi: 10.3402/gha.v4i0.7191.
9. Zhang X, Hu X, Reinhardt JD, Zhu HJ, Gosney JE, Liu S et al. Functional outcomes and health-related quality of life in fracture

- victims 27 months after the Sichuan earthquake. *J Rehabil Med* 2012; 44: 206-9.
10. Sphere Handbook. Humanitarian Charter and Minimum Standards in Humanitarian Response. Minimum standards in health action. Cited 2015 August 17. Available from URL: <http://www.spherehandbook.org/content/pages/en/9.minimum-standards-in-health-action.pdf>.
 11. World Health Organization. Classification and minimum standards for Foreign Medical Teams in sudden onset guidelines. Cited 2015 August 17. Available from URL: http://www.who.int/hac/global_health_cluster/fmt_guidelines_september2013.pdf?ua=1.
 12. Hu X, Zhang X, Gosney JE, Reinhardt JD, Chen S, Jin H et al. Analysis of functional status, quality of life and community integration in earthquake survivors with spinal cord injury at hospital discharge and one-year follow-up in the community. *J Rehabil Med* 2012; 44: 200-5
 13. Rathore FA, Gosney JE, Reinhardt JD, Haig AJ, Li J, DeLisa JA. Medical rehabilitation after natural disasters: why, when, and how? *Arch Phys Med Rehabil* 2012; 93: 1875-81
 14. Li Y, Reinhardt JD, Gosney JE, Zhang X, Hu X, Chen S et al. Evaluation of functional outcomes of physical rehabilitation and medical complications in spinal cord injury victims of the Sichuan earthquake. *J Rehabil Med* 2012; 44: 534-40
 15. Gosney JE Jr. Physical medicine and rehabilitation: critical role in disaster response. *Disaster Med Public Health Prep.* 2010; 4: 110-2.
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