Update in Disaster Rehabilitation

An International Society of Physical and Rehabilitation Medicine Perspective

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Abstract: Disasters (both natural and man-made) are escalating worldwide, resulting in a significant increase in survivors with complex and long-term disabling injuries. Physical and rehabilitation medicine is integral in disaster management and should be included in all phases of the disaster management continuum, which comprise mitigation/prevention, preparation, response, and recovery phases. This Joel A. DeLisa Lecture was presented on February 11, 2021, at the Association of Academic Physiatrists Annual Scientific Meeting–"Physiatry 21." The lecture highlights the synergistic position of the International Society of Physical and Rehabilitation Medicine and the Disaster Rehabilitation Committee, to provide crucial leadership and governance role in liaison and coordination with the World Health Organization (and other stakeholders), to provide rehabilitation input during future disasters.

Key Words: Disaster, Rehabilitation, International Society of Physical and Rehabilitation Medicine, World Health Organization, Disaster Rehabilitation Committee

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It is an honor and privilege to present the Joel A. DeLisa Lecture at the Association of Academic Physiatrists (AAP) Annual Scientific Meeting–"Physiatry 21" and to receive the prestigious "Joel A. DeLisa Lectureship Award–2021." Prof DeLisa is a pioneer in the field of physical and rehabilitation medicine (PRM) and an outstanding rehabilitation physician. He was the President of the International Society of Physical and Rehabilitation Medicine (ISPRM) from 2008 to 2010. He is a role model and an aspiration for physiatrists around the globe. He advocated for the fundamental role of PRM during disasters and the leadership responsibility of the ISPRM, which is reflected in the overarching theme of this lecture.

DISASTER REHABILITATION AND ITS IMPORTANCE

Disasters (both man-made and natural) are increasing worldwide and occur disproportionately in the low-resource regions of the world, accounting for more than 90% of deaths and 98% of people affected.[1–3] Advancements in disaster response and management in recent years have resulted in a significant increase in survivors, including those with complex impairments and disability (temporary or permanent) from common injuries, such as musculoskeletal (bone fractures, limb amputations, crush injuries), spinal cord and/or traumatic brain injury, soft tissue and peripheral nerve injury, burns, etc.[3–5] Furthermore, human exposure and impact on the population and society from these disasters are intensifying. Hence, the role of PRM is now considered integral in disaster management systems. It needs to be initiated acutely during emergency response, in the continuum of care over a longer-term until treatment goals are achieved, and survivors successfully integrated back into society. There is evidence to support the early involvement of rehabilitation programs to minimize mortality, reduce disability, and improve functional outcomes and participation for disaster survivors.[6–8]

Disaster rehabilitation presents a model of holistic care for disaster survivors delivered by an interdisciplinary team encompassing a range of professions, including medical, nurses, and allied health professionals (such as physiotherapists, occupational therapists, social workers, dieticians, etc.).[3,9] Similar to any rehabilitation program provided in established settings, an individualized patient-centered rehabilitation plan is developed within existing resources, to achieve realistic goals depending on disaster survivors' disease/injury state and needs. The aims are to optimize function and to improve activity and participation within contextual factors (personal and environmental), which align with the World Health Organization's (WHO) International Classifications of Functioning, Disability and Health conceptual framework.[3–5,9]

POTENTIAL CHALLENGES OF EMERGENCY RESPONSE IN THE CONTEXT OF DISABILITY AND REHABILITATION

The needs of disaster survivors can vary depending on the disaster type, location, and magnitude. However, rehabilitation is required at all phases of the disaster management continuum care cycle, which comprises mitigation/prevention, preparation, response, and recovery phases.[3] Provision of rehabilitative care in disaster settings can be more complex and challenging because of factors, such as underdeveloped and/or limited access to local services, geophysical challenges, communication, logistics, safety, sociocultural issues, and others.[3–5,9] Furthermore, a situation can be compounded, specifically in large-scale

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disasters, when local health infrastructure (including rehabilitation resources) can be destroyed or disrupted or can be quickly overwhelmed by the influx of patients with new injuries/conditions. Patients may not have access to all required rehabilitation disciplines and care coordination. The role of PRM professionals can be challenging and requires a multidimensional approach reflecting evolving clinical requirements and timely delivery of evidence-based care with limited resources.[6,9,10] Despite growing demand, skilled rehabilitation workforce and services are still limited in many disaster-prone countries, implying a significant burden of rehabilitation for individuals (their families) and the community.[3,4,11]

GLOBAL DISASTER REHABILITATION AWARENESS: ROLE OF THE ISPRM AND DISASTER REHABILITATION COMMITTEE

In the last decade, international partnerships and coordination efforts under various leadership (WHO, United Nations, Office for the Coordination of Humanitarian Affairs, etc.) have brought significant developments in disaster response and management, including the delivery of acute medical and rehabilitation care. There have been collaborative efforts from experts in the development of innovative approaches for PRM service delivery during disasters, to minimize disparities and incoordination in international relief efforts.[1,3,12] Improved leadership from various governmental organizations, international nongovernmental organizations, and nongovernmental organizations has enhanced coordination, planning, and standardization of PRM responses in disaster settings, specifically supported by the ISPRM, which serves as an international umbrella organization for PRM physicians worldwide.[5,12,13]

Established in 1999, the ISPRM in collaboration with the WHO serves as a leader in rehabilitation medicine globally and is a firm advocate for people with disabilities. As an nongovernmental organization, the ISPRM works as a catalyst for international PRM activities, with a humanitarian, professional, and scientific mandate. Currently, it has more than 73 active National Societies from all over the world with more than 7000 members.[14] The key mission of the ISPRM is to enable physicians and researchers in PRM to develop and apply optimal patient care, strengthen the development and capacity of national organizations, partner with international organizations to develop and implement effective disability and rehabilitation policies, and promote collaboration among governments, nongovernmental organizations, organizations of persons with disabilities, private sectors, etc.[15] The main goals are to assist national professional organizations to influence government rehabilitation policy, develop comprehensive medical specialists in PRM, and promote rehabilitation and facilitate research, communication, and international exchange.[15,16]

The ISPRM endorses disaster rehabilitation as one of its main missions and recognizes it as an integral component of disaster response and management plan.[17] The ISPRM currently consists of 8 task forces and 16 different committees, including the Disaster Rehabilitation Committee (DRC).[14] In accordance with the WHO-ISPRM Liaison initiative, the ISPRM DRC (formally known as Committee on Rehabilitation Disaster Relief) was officially formed at the fifth ISPRM World Congress (Istanbul, Turkey, 2009), to advocate the PRM perspective in minimizing disability and optimizing functioning and health-related quality of life in persons who sustain traumatic injury and those with preexisting disability in disasters (natural or man-made disasters).[17] The DRC also collaborates with the WHO Liaison Committee[18] on WHO disaster-related disability initiatives, which aims to provide technical resources and expertise. The DRC operational guidelines are in line with the ISPRM's policy statement for the response to sudden onset disasters and to support its humanitarian mission, enacting its leadership role in global humanitarian rehabilitation disaster response (access link: https://www.isprm.org/collaborate/drc/). Since its establishment, it has developed formidable expertise to give organizational and technical advice to relevant stakeholders including the WHO, United Nations, local governments, nongovernmental organizations, and others regarding disaster management from a rehabilitation perspective.[19] The DRC activities on the global stage are embedded in a strategy that includes coordinated activities of ISPRM member of National Societies and the WHO-ISPRM Liaison Committee and currently have more than 68 active members from all around the globe. It has set up specific working groups led by respective coordinators to oversee the "DRC action plans" (Fig. 1).[17]

Some of the key activities of the DRC include the following: collaboration and coordination, capacity building by education and training (including hosting education sessions at ISPRM congresses, development of online educational/training modules, etc.), empowerments of National Societies when needed, strengthening of sustainable rehabilitation programs for disaster survivors (community based, vocational), generating (development of evidence-based guidelines/protocols for common disaster-related injuries) and disseminating evidence-based knowledge, conducting a disaster-preparedness survey of rehabilitation physicians to develop a registry, development of standardized assessment tool for disaster settings, create an enabling environment for research and knowledge translation, etc. It advocates investment in rehabilitation resources (both infrastructure and workforce) from a global perspective that contributes to health, economic, and social development. The overall aim of all these activities is to provide comprehensive and coordinative care of disaster survivors in aftermath disasters and in the longer-term, advance global disaster rehabilitation policy and practice, and strengthening and capacity building of local rehabilitation services for future disasters. Some of the core activities of the ISPRM and DRC regarding disaster rehabilitation initiatives are outlined hereinafter.

Collaboration With the WHO and Other Organizations

Since its official establishment in 1999, the ISPRM has closely collaborated as a nonstate actor with the WHO, specifically with the disability and rehabilitation team.[20] The WHO-ISPRM Liaison Committee was established, which has continuously contributed to WHO activities according to agreed and accepted collaboration plans.[18,21] This includes the participation of ISPRM in WHO meetings and collaboration in the network of WHO partners [including emergency medical team (EMT) initiative], implementation of Sustainable Development Goals (SDG Goal 3—Health), participate in activities in achieving the goals of the "Rehabilitation 2030: A Call for Action," the

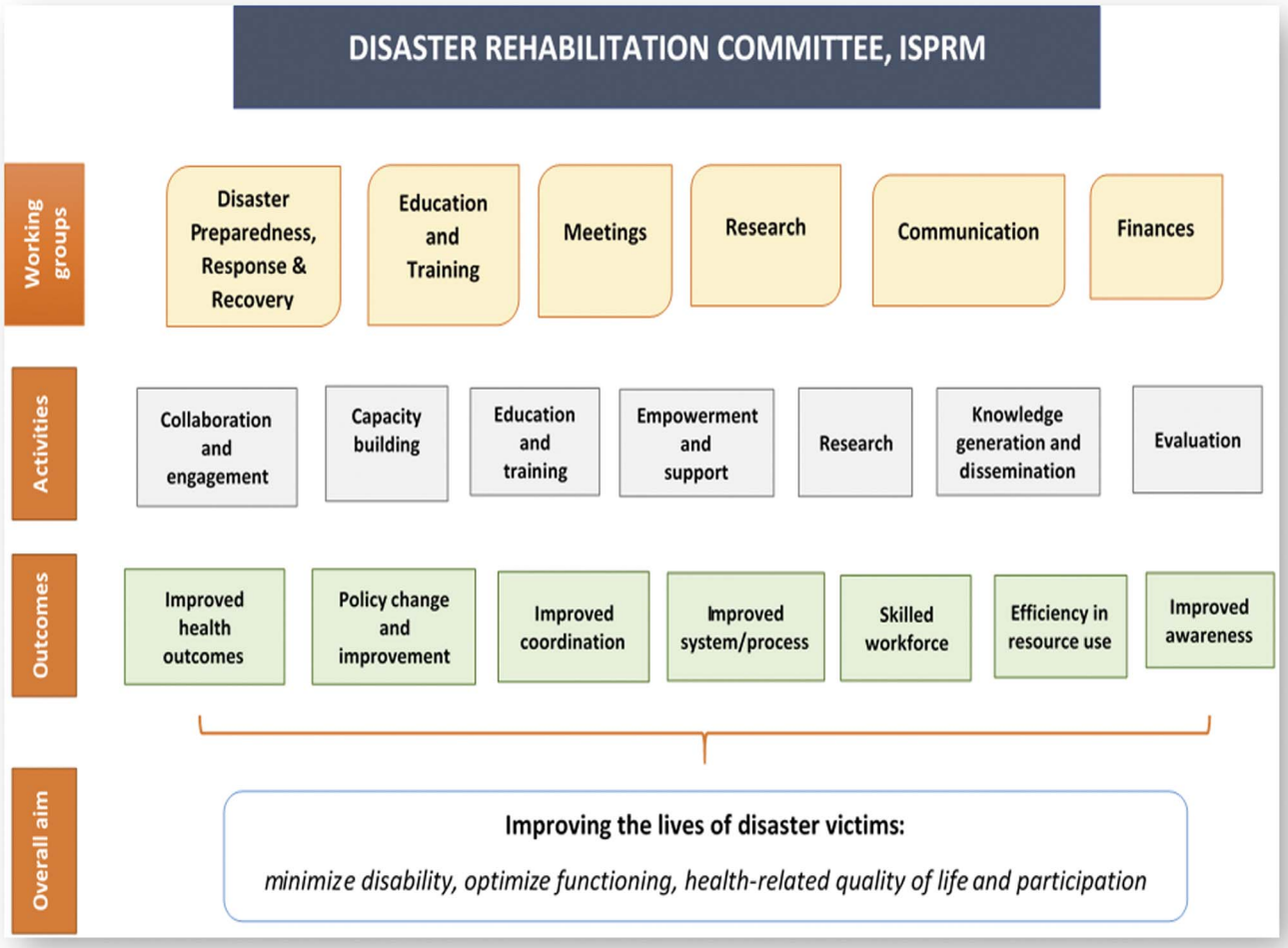

FIGURE 1. Disaster Rehabilitation Committee working groups.

WHO "Global Disability Action Plan 2014–2021" and the World Health Assembly resolution on improving access to assistive technology, and others.

The ISPRM and DRC support the WHO-EMT initiative,[22] one of the vital developments in disaster management, that follows a systematic approach to registration, deployment, and response coordination to disasters. The WHO-EMT initiative provides structure and standardization, aligned with a set of overarching principles to prepare, plan, and provide effective and coordinated care during disasters for future deployment.[22] The WHO-EMT initiative acknowledges rehabilitation as an integral aspect of medical response and patient-centered care in disaster settings and has included rehabilitation as one of the core working teams.[23] The DRC has continuously contributed to its activities including participation in developing the various guidelines/protocols, representing ISPRM at the global EMT meetings, and providing advice to the ISPRM member of National Societies on EMT procedures, rehabilitation specialist team accreditation, and inclusion procedures. One such collaborative product of the WHO, ISPRM (and DRC), and global rehabilitation experts in the development of the first guideline for rehabilitation team during disasters is "Emergency medical teams: minimum technical standards and recommendations for rehabilitation" (launched at the 2016 EMT Global Meeting in Hong Kong).[23] Furthermore, the DRC also facilitates National Societies to liaise with national health/emergency/ministry agencies (via WHO regional office contacts, etc.) to include rehabilitation professionals on national response teams and/or to establish specialized rehabilitation response cell teams to be deployed in the disasters.

In many previous disasters, rehabilitation personnel (in particular rehabilitation physicians) were not included, and the rehabilitation teams that were deployed worked individually and/or in "silos."[1,24,25] Under auspicious of the Presidential Cabinet of the ISPRM and Rehabilitation Medicine Society of Australia and New Zealand, the DRC is in a process of creating a central register/database of rehabilitation physicians from ISPRM member societies, willing to undergo disaster training and possible deployment (if requested) to future disasters. Aligned with this, recently, a trial pilot survey project ($n = 76$ responses) was completed and published in the *Journal of ISPRM*.[25] It provided insight from rehabilitation professionals regarding their preparedness and experience and interest in education and training requirements for future deployment to disaster settings. The findings suggest that 63% of participants expressed interest in future deployment to disaster settings,

and only 24% had already received some form of disaster management training in the past.[25]

The development of the ISPRM database can serve multiple purposes as a repository of disaster rehabilitation medical expertise, which will facilitate the deployment of rehabilitation physicians and other rehabilitation professionals in support of international rehabilitation disaster relief efforts.

Generating Evidence for Rehabilitation in Disaster Settings

One of the key agendas of the DRC is to generate evidence through research and publications to improve healthcare delivery through high-quality and up-to-date evidence. Since its establishment, the DRC and its members have made significant contributions to the academic literature and research, documenting and building the evidence base for the emerging subspecialization of disaster rehabilitation. The team members conduct collaborative research with national PRM societies and publish high-quality articles in academic literature, and the DRC has published more than 50 articles in reputed academic journals.

Another activity of the DRC includes the organization and delivery of educational sessions and workshops in the ISPRM and other scientific congresses. It aims to disseminate up-to-date information and to foster the exchange of ideas. The DRC has regularly and successfully organized various forms of scientific sessions in ISPRM congresses and participates in the other international and national congresses. The DRC members successfully established formal relationships with the ISPRM's official journals including the *Journal of ISPRM* and other renowned international academic journals, and many of its members currently serve as executive members in the editorial and reviewer boards.

Education, Training, and Knowledge Dissemination

In line with the WHO's "Rehabilitation 2030: A Call for Action," the DRC and WHO Liaison Committees both recognize strengthening rehabilitation capacity through education and training [in low- and middle-income countries (LMICs)] needed to expand a skilled work force, improve governance and service provision, and improve awareness of rehabilitation for effective planning and comprehensive management of survivors in future disasters.[26,27] Rehabilitation professionals are still insufficient in number and distributed unequally, specifically in LMICs and disaster-prone countries.[26,28] According to the latest WHO data, there are less than 10 skilled rehabilitation practitioners per 1 million population, whereas speech and occupational therapists and rehabilitation physicians are very low or do not exist in many LMICs.[26]

As one of its core missions, the DRC has been proactive in capacity building of the skilled rehabilitation workforce through education and training in line with the ISPRM and WHO directive. One such example is the Australian Rehabilitation Research Centre's Rehabilitation Flying Faculty (consisting of DRC members). In the past 6 yrs, the "Rehabilitation Flying Faculty" has conducted various educational/capacity-building programs for a diverse group of health professionals in more than 15 LMICs, such as Madagascar (2014), Nepal (2015), Mongolia (2016), Nigeria and Morocco (2017, 2018), Pakistan (2003–2018), Mongolia (2016), Saudi Arabia (2018), Thailand (2018), Bangladesh (2018), China (2016–2018), Indonesia (2019), and Brunei and Sudan (2019).

The ISPRM DRC Educational and Training Workgroup support in the development of the online educational curriculum based on a framework of globally recognized humanitarian competencies to help train ISPRM members to function as effective disaster responders in their respective area. Framework competencies include humanitarian ethics and law in disasters, humanitarian architecture and coordination, disaster management, disaster management for disability and rehabilitation, humanitarian health in disasters, personal management, team leadership, etc. Online content hosted on these eLearning platforms is widely accessible, free of charge, and available in several languages on the online humanitarian learning community platforms DisasterReady (https://www.disasterready.org/) and the International Federation of Red Cross (IFRC) Learning Platform (http://www.ifrc.org/en/get-involved/learning-education-training/learning-platform1/).

Furthermore, e-learning, low-cost, professional development course in neurological rehabilitation was launched, developed by the Royal Melbourne Hospital team (members of DRC), made available worldwide (via the University of Melbourne) to rehabilitation physicians, general practitioners, rehabilitation trainees, medical students, nurses, and allied health professionals, especially for members in LMICs. This introductory course was endorsed by the ISPRM (and ISPRM Education Committee) and highlights the basic principles of managing disabilities associated with neurological disease. The course is intended for clinicians caring for people with neurological diseases to increase their knowledge and confidence.

Developing Disaster Rehabilitation Response Plan

The strengthening of rehabilitation-inclusive disaster response and management systems has been the focus of the key players in the field, including the WHO. However, in many disaster-prone countries, comprehensive rehabilitation-inclusive disaster management plans are yet to be developed.[1,10] The DRC is dedicated to the development of a rehabilitation-inclusive management plan for disaster survivors, in which responsibility is shared by all actors in organizing, managing, and coordinating medical teams to ensure a rapid, professional coordinated response and long-term care. The ISPRM and other humanitarian response authorities emphasize the need for a coordinated disaster response management structure/plan to ensure positive outcomes through collaborative partnerships that inspire interest, mobilize resources, engage in communications, and knowledge sharing.

The DRC recently proposed a structured Disaster Rehabilitation Response Plan to enable ISPRM to provide leadership and governance role in liaison/coordination with the WHO-EMT initiative and other relevant stakeholders to provide rehabilitation input during disasters.[13] The Disaster Rehabilitation Response Plan comprises a "three-tier approach," which includes the following: tier 1, immediate disaster response at a national/international level; tier 2, organization and deployment of rehabilitation personnel; and tier 3, rehabilitation management of disaster survivors and community reintegration.[13] The plan highlights the central

leadership role of the ISPRM and DRC (tier 2) within the WHO-EMT initiative (tier 1), to support the coordination, preparation, and management of rehabilitation teams and/or members for deployment to disasters.[13]

Rehabilitation Response in Pandemics

In the last two decades, there has been an upsurge in epidemics, such as severe acute respiratory syndrome virus, middle eastern respiratory syndrome, H1N1 influenza, Zika and Ebola virus, etc.[29] Specifically, the current novel coronavirus disease 2019 (COVID-19) pandemic is one of the worst unprecedented global public health emergency. Depending on the clinical spectrum of COVID-19, various impairments resulting in disabilities and long-term sequeal of recovered patients are reported, which include respiratory, neurological and/or cerebrovascular dysfunction, functional impairments, psychological issues, and others.[29,30] Many of these are amenable to rehabilitation, and the global healthcare authorities (including the WHO, ISPRM, and others) recognize the importance of rehabilitation-inclusive management plans for comprehensive care during the acute stage and in the longer term.[31,32] Benefits and feasibility of rehabilitation interventions and early involvement of rehabilitation professionals in disaster settings are well recognized and evidence based.[3] Most recently, the DRC has proposed an extension of the Disaster Rehabilitation Response Plan to pandemics, such as COVID-19, to provide coordinated rehabilitation input during current and future pandemics.[33] This is in line with the critical challenges faced by health systems of both developed and developing countries worldwide, including rehabilitation services, because of an increase in demand to provide care of patients during their recovery phase, as they transfer to subacute facilities. Information on organizational and operational challenges in rehabilitation settings that need consideration for the management of COVID-19 patients is detailed in other published reports.[31] The key objectives of the proposed rehabilitation response plan are to strengthen and deliver rehabilitation services during pandemics from an international coordinated perspective.[33] It signifies the crucial leadership and governance role of the ISPRM to liaise/coordinate with the WHO and other relevant stakeholders, to provide support to its members of National Societies for delivery of evidence-based rehabilitation input amid pandemics.[13,33] The potential roles for key considerations for the ISPRM broadly explained in five different categories (governance, coordination, communication, evaluation, and care continuum) are detailed in the previous report.[33] The ISPRM has already established a dedicated COVID-19 resource center and a special interest group and has conducted various virtual educational sessions (https://www.isprm.org/). The DRC team is also actively publishing COVID-19 rehabilitation–related manuscripts in academic journals and circulating up-to-date information to all members via e-mails and social media portals.

THE WAY FORWARD

There is strong consensus among disaster relief professionals that rehabilitation is integral in disaster response and management, issuing a clear mandate for all actors in the disaster relief field for efficient and effective delivery of care during disasters.[23,34,35] Although current developments in the disaster rehabilitation field are the much-needed steps in the right direction, there remain many challenges.[3,36] First, service provision capacity for rehabilitation (both infrastructure and skilled workforce) does not meet existing demand in many disaster-prone countries, specifically in LMICs.[4,10,24] Second, implementation of the published minimum standards for rehabilitation services in disaster settings is yet to be implemented and evaluated. To date, no rehabilitation EMTs have been verified under the WHO-EMT initiative, and integrating rehabilitation personnel either into existing EMTs or as specialized rehabilitation cells is under development.[22] Last but not the least, awareness about rehabilitation is very limited in many countries. This is compounded by limited disaster-related data and research, hindering policy makers, service providers, and disaster responders to make informed decisions that strengthen rehabilitation services.[1]

The DRC goal is to work together with other ISPRM Committees to contribute and support National Societies and the WHO-EMT initiative. The aim is to build a strong rehabilitation workforce, promote evidence-based practices in disaster rehabilitation, and support improved quality and efficiency of rehabilitation and care services for disaster survivors internationally. The unmet need and gaps in rehabilitation in disaster settings are widely reported, signifying a need for intersectoral and interdisciplinary partnerships among national and international organizations. Furthermore, there is a need for mapping and understanding the situation of rehabilitation services; developing a sustainable rehabilitation workforce, upskilling, and educating/training the existing workforce; developing and implementation of evidence-based guidelines, policies, and protocols; and generating information about the efficiency of rehabilitation interventions. The way forward for the development of the integrated rehabilitation-inclusive disaster plan requires strong leadership and governance from the ISPRM, WHO, and other prominent organizations to coordinate a diverse range of stakeholders involved in this field. The ISPRM and DRC are committed to ensuring effective and timely services reach the vulnerable communities at risk. Some of the key priority areas that need to be considered to strengthen disaster rehabilitation include (but not limited to):

- Effective collaboration and strong governance/leadership
  - o Develop rehabilitation-inclusive disaster management systems
  - o Leadership role with central national healthcare ministry/organization
  - o Enhance capacity and collaboration with national/international organizations, civil society, private sectors
- Building capacity in rehabilitation (including regional capacity) for
  - o Disasters preparedness/mitigation
  - o Rehabilitation capacity at national health level, skilled workforce, and EMTs
  - o Develop interdisciplinary and intersectoral partnerships
- Comprehensive care of disaster survivors
  - o Person-centered interdisciplinary care
  - o Standardized assessment tool and
  - o Psychological support
  - o Service provision (including funding) of assistive devices

- Improve communication (information gathering, sharing, and disseminating)
  - o Strengthen evidence-based medicine—information, data collection, and research
  - o Foster understanding and learning from past experiences
  - o Knowledge dissemination
- Increase public awareness
  - o Active participation of disaster survivors/family/community
  - o Empowerment and educational programs for healthcare professionals
  - o Inclusion of disaster rehabilitation in the medical curriculum
- Strengthen rehabilitation services including community-based rehabilitation
- Bilateral assistance—disaster victims: health security, financial, jobs, education
- Innovative models of rehabilitation (virtual care, telerehabilitation, mobile units, etc.)

CONCLUSIONS

This lecture focused on the need for an integrated rehabilitation-inclusive disaster response and management approach, as well as interdisciplinary team-based rehabilitation care of disaster survivors, a core mandate of the DRC and ISPRM. More initiatives are required to enhance the rehabilitation service delivery in disaster settings, including in pandemics. Rehabilitation professionals need to be trained in such environments to deliver quality care to patients with complex injuries, within confined resources. More evidence-based research on the effectiveness of rehabilitation interventions over a longer term is needed for future planning and development of guidelines and policy. Given the high needs of disaster survivors experiencing disability (especially severe and permanent disability), the challenge ahead is to implement evidence-based disaster rehabilitation models of care within a comprehensive coordinated healthcare system. The DRC and ISPRM advocate synergistic coordination and collaboration from professional organizations, governments, development agencies, and civil society in the field, for the development and implementation of sustainable rehabilitation-inclusive disaster response and management plan. Strengthening rehabilitation within the local context as part of the continuum of care for disaster survivors provides an opportunity to support the attainment of universal health coverage and the United Nations Sustainable Development Goals.

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