Global Health and Disability: A Review and Call to Action for All Rehabilitation Professions

Evan M. Pucillo  
*University of St. Augustine for Health Sciences, epucillo@usa.edu*

Matthew B. Huish  
*University of Utah*

Quinn Tate  
*University of Utah*

Edward C. O’Bryan  
*Medical University of South Carolina*

Ty T. Dickerson  
*University of Utah*

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Global Health and Disability: A Review and Call to Action for All Rehabilitation Professions

Evan M. Pucillo, PT, DPT\textsuperscript{1}, Matthew B. Huish, PT, MBA\textsuperscript{2}, Quinn Tate, MS\textsuperscript{3}, Edward C. O’Bryan, MD\textsuperscript{4}, Ty T. Dickerson, MD, MPH\textsuperscript{5}

1. Department of Neurology\textsuperscript{D} • University of Utah\textsuperscript{D} — Salt Lake City, UT, USA
2. Department of Physical Medicine & Rehabilitation\textsuperscript{D} • University of Utah\textsuperscript{D} — Salt Lake City, UT, USA
3. School of Medicine\textsuperscript{D} • University of Utah\textsuperscript{D} — Salt Lake City, UT, USA
4. Physician Assistant Studies\textsuperscript{D} • College of Health Professions • Medical University of South Carolina\textsuperscript{D} — Charleston, SC, USA
5. Center for Global Health Education\textsuperscript{D} • School of Medicine\textsuperscript{D} • University of Utah\textsuperscript{D} — Salt Lake City, UT, USA

Impact Statement

The World Health Organization estimates that 15% of people worldwide are living with a disability. That percentage will likely increase as the population gets older. Many of these people live in low-income countries with little access to the rehabilitative services that would increase their quality of life. The purpose of this article is to provide a brief narrative about global health and rehabilitation, show the lag in global health efforts between the rehabilitation professions and other healthcare professions, and to motivate rehabilitation
professionals into taking action to change both the current and future burden of disability worldwide.

Abstract

The World Health Organization estimates 15% of the world’s population is living with disability and anticipates an increase as the population ages. Disability is a growing healthcare concern and presents a tremendous burden to all nations. The world will soon need to provide health and rehabilitative care for an enormous number of persons with disability. The purpose of this article is to provide a brief narrative review pertaining to global health and rehabilitation, and to motivate the rehabilitation professions in taking immediate action through further investment in global health initiatives to manage both the current and projected burden of disability. A deficient level of research exists in global health by the rehabilitation professions and there is significant lag in their efforts when compared to other healthcare professions. The World Health Organization’s World Report on Disability (2011), Global Disability Action Plan 2014-2021, and the Global Burden of Disease study are pivotal bodies of work in this field. They serve as both a model and a challenge to affect large-scale global change among the rehabilitation professions. Collectively, an immediate effort is needed to bolster disability and rehabilitation research in developing nations, global rehabilitative outreach programs, and improve access to rehabilitative healthcare to persons with disability in order to fully address the magnitude of this matter.

Introduction

Disability is defined by the World Health Organization (WHO) International Classification of Functioning, Disability and Health (ICF Model) as a “complex, dynamic, multi-dimensional, and contested” interaction or experience between an individual with pathology or impairment, and their environment (World Health Organization 2001; World Health Organization 2014; World Health Organization 2004; World Health Organization 2011). Disability may encompass any form of impairment in body structure and function that leads to a limitation in participation of activity, and may refer to any short- or long-term health loss (Kostanjsek et al. 2013; Murray and Lopez 1997; Murray et al. 2012; World Health Organization 2001; World Health Organization 2011). Disability unequally affects the poor, women, and the elderly in developing nations when compared to other demographics (Gutenbrunner et al. 2014; Gutenbrunner et al. 2015; Kostanjsek et al. 2013; Murray et al. 2012; World Health
Persons with disability (PwD) are likely to have the greatest need for healthcare, “and [be] the least able to access it” (Maart and Jelsma 2014, 1489). Data collected from the Global Burden of Disease Study (2010) have shown that individuals in the poorest wealth quintile have significantly greater prevalence of disability (Horton 2013; Kostanjsek et al. 2015; Murray et al. 2012; Vos et al. 2015). Furthermore, the WHO estimates about 15% of the world’s population (one billion persons) is living with disability and anticipates an increase to nearly two billion persons as the global population ages (Bethge et al. 2014; Kostanjsek et al. 2013; World Health Organization 2011). Of this rapidly increasing number of PwD, it has been estimated that over 70% of these people may be found in developing nations (Harkins, McGarry, and Buis 2013).

Developing nations have seen an ever-increasing level of interest and participation in global health and humanitarian service initiatives by many academic programs, practitioners, and medical institutions. Areas including, but not limited to medical care, infectious disease, child and maternal health, and HIV/AIDS have been front stage in the global health movement. Of meritorious note, numerous individuals and institutions working on behalf of improving global health have made many outstanding achievements studying disability. Until more recently, however, rehabilitation has not received adequate attention when compared to other public health concerns (Gutenbrunner et al., 2018).
As rehabilitation professions: physiatrists, physiotherapists (physical therapists), occupational therapists, speech therapists, and nurses have collective potential to shape the world’s understanding, management, and integration of PwD (Bethge et al. 2014; Gutenbrunner et al. 2014). As compassionate healthcare providers, there is both a moral duty, and capacity, to provide and share life-changing interventions to those most in need. Both the World Confederation for Physical Therapy (WCPT) and the World Federation of Occupational Therapists (WFOT) offer comprehensive resources and information on global health engagement, in addition to taking the position that rehabilitation providers are instrumental in optimizing function for PwD in developing nations. Both the WCPT and WFOT have close working relationships with the UN and the WHO aimed at improving the reach and impact of therapists around the world. However, the WHO has recently made clear that there can, and should, be a stronger focus of efforts in shifting the prevalence and burden of global disability from widespread, to well managed (Haig 2007; World Health Organization 2004; World Health Organization 2014; World Health Organization 2011).

Accordingly, the purpose of this article is to: 1. Provide the reader with background information on the global burden of disability, 2. Identify gaps in the physical medicine and rehabilitation (PM&R) professions' global health involvement in rehabilitative care for PwD, 3. Present the obvious and immediate need for increased involvement by PM&R professions worldwide, and 4. Highlight opportunities that professionally align with the recently outlined WHO Disability Action Plan 2014-2021 objectives.

The Global Challenge

Apart from the WHO Community-Based Rehabilitation (CBR) model, the dearth of published literature on rehabilitation professions’ global health programs and research speaks highly to its underrepresentation in efforts manage the worldwide burden of disability (Bethge et al. 2014; Cleaver and Nixon 2014; Dean et al. 2011; Dean et al. 2014; Finkenügel, Wolters, and Huijsman 2005; Haig 2007; Hartley et al. 2009; Hoy et al. 2014). Numerous authors have concluded that more rigorous and systematic research is needed in rehabilitative efforts of PwD in low- and middle-income countries (LMIC) (Cleaver and Nixon 2014; Krahn 2011; Magnusson 2009; Mannan et al. 2012; Tardi and Njelesani 2015; Turk and Mudumbi 2014). Subsequently, one
The major issue identified widely throughout the literature with respect to the planning and delivery of rehabilitative care to underserved regions is the lack of available healthcare manpower and resources inherent to each region (Cassady et al. 2014; Dean et al. 2011; Dean et al. 2014; Haig 2007; Frye 1993; World Health Organization 2004). Not surprisingly, in some LMIC the number of practicing physiotherapists ranges from one in five hundred thousand to one in 1.2 million (Ellerbe 2011; Landry et al. 2009). Likewise, speech language pathologist, occupational therapist, and physiatrist densities and are virtually non-existent in areas like Sub-Saharan Africa (Haig et al. 2009; Tinney et al. 2007; Tuakli-Wosornu and Haig 2014). To contrast, a 2009 survey in the United States found the density of physiotherapists to be 6.2/10,000, which had increased 63.1% from the previous data collected in 1995, and is anticipated to increase even further (Landry et al. 2009). These data clearly make evident the disparity in available manpower for rehabilitation professions between the developed and developing world, with the United States alone experiencing approximately a 300-fold higher density of physiotherapists in some cases (Ellerbe 2011; Landry et al. 2009; Gupta, Castillo-Laborde, and Landry 2011).
Additionally, the economic cost of disability cannot be understated, and has been examined extensively (Berthoud 1991; Ding et al. 2016; Lamichhane and Okubo 2014; Metts 2004; Murray et al. 2012). The impact disability has on perpetuating the cycle of poverty is widely accepted (Berthoud 1991; Metts 2004; World Health Organization 2011). It is estimated that the annual range for global gross domestic product (GDP) lost due to disability is between $1.71 and $2.23 trillion (USD), which represents over 5% of the total global GDP (Metts 2004). In LMIC, the effect on GDP is greater, representing up to a 50% higher proportion of total GDP lost secondary to disability (Metts 2004). The World Bank has advocated for addressing both the direct costs of disability to the affected individual as well as the limited economic opportunity for those providing home care to the patient, usually friends and family. Estimates have shown that even a 50% reduction in the economic costs of disability could result in economic output increases that outweigh the costs of the interventions themselves (Metts 2004). Improvements are being made, but as we seek to address the global disability epidemic, it is imperative not to forget both the immediate and downstream economic benefits of doing so.

Overall, the undeniable burden of disability is growing as the world’s population rapidly expands and ages (World Health Organization 2011), and likewise the rise of disability caused by non-communicable diseases such as heart disease, stroke, cancer, diabetes, and hypertension are widely expanding (Ding et al. 2016; Kostanjsek et al. 2013; Murray et al. 2012; Vos et al. 2015). Data collected from the Global Burden of Disease Study in 2010 and 2013 reveals that disability associated with non-communicable diseases is on the rise, up approximately 9% (Murray and Lopez 1997; Murray et al. 2012; Vos et al. 2015). Cardiovascular disease, stroke, cancer, and diabetes are now leading causes of limitations in physical ability (Ding et al. 2016; Kostanjsek et al. 2013; Murray et al. 2012; Vos et al. 2015). It has also been estimated that less than 5% of these PwD currently have access to rehabilitation services (Harkins, McGarry, and Buis 2013). Similarly, it is estimated that nearly 50% of PwD cannot afford the health care they need, and roughly 10% of PwD in need of a wheelchair have access to one (World Health Organization 2004; World Health Organization 2014; World Health Organization 2011). Therefore, professionally trained rehabilitation professionals engaging in global rehabilitation / Association of Academic Physiatrists)

1. Disability and Social Policy: Meeting the Costs of Disability [Senior Fellow Paper] (Policy Studies Institute)
2. The economic burden of physical inactivity: a global analysis of major non-communicable diseases (The Lancet)
3. The nexus between disability, education, and employment: Evidence from Nepal (Oxford Development Studies)
4. Disability and development
5. Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990—2010: a systematic analysis for the Global Burden of Disease Study (The Lancet)
7. Disability and development
8. World report on disability (Lancet)
9. Disability and development
10. Disability and development
11. Disability and development

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2. The economic burden of physical inactivity: a global analysis of major non-communicable diseases (The Lancet)
3. Counting disability: global and national estimation (Disability and rehabilitation)
4. Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990—2010: a systematic analysis for the Global Burden of Disease Study (The Lancet)
5. Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013 (The Lancet)
7. Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990—2010: a systematic analysis for the Global Burden of Disease Study (The Lancet)
health outreach and development efforts are uniquely poised to have a profound impact on PwD.

A CALL TO ACTION FOR REHABILITATION PROFESSIONALS

This review identified the recent framework “The WHO Global Disability Action Plan 2014-2021: Better health for all people with disability,” which sheds great light on the enormity of the global disability problem facing our future generations (World Health Organization 2014). In this document, experts across many disciplines have outlined a multifaceted approach to dealing with the tremendous burden of global disability through a set of goals, visions, and objectives to guide member states, international and national partners, and the global community into action (World Health Organization 2014). For a more thorough and detailed description of these processes the reader is referred to the original WHO Global Disability Action Plan (World Health Organization 2014). The following headings summarize and highlight specific areas of potential contribution for the PM&R professions that contextually align with the following WHO 2014 Global Disability Action Plan Objectives.

- **WHO Objective 1**: To remove barriers and improve access to health services and programs (World Health Organization 2014).
- **WHO Objective 2**: To strengthen and extend rehabilitation, habilitation, assistive technology, assistance and support services, and community-based rehabilitation (World Health Organization 2014).
- **WHO Objective 3**: To strengthen collection of relevant and internationally comparable data on disability and support research on disability and related services (World Health Organization 2014).
WHO Action 1.1 – 1.2, 1.5: Improve professional leadership and accountability (World Health Organization 2014). According to the WHO, "At present, most schools of public health, medical schools and other institutions involved in training health professionals around the world do not include disability and rehabilitation in their curricula." (World Health Organization 2011). A complete paradigm shift is needed for the education of the next generation of rehabilitation leaders in these matters. This presents both a tremendous opportunity, and challenge, to positively affect profession-wide leadership, development, and implementation of new standards within academia that incorporate an increased awareness of global disability (Bethge et al. 2014; Butteris et al. 2015; Cassady et al. 2014; Chermak 1990; Dean et al. 2011; Dean et al. 2014; Evert et al. 2007; Grant 1998; Haig 2007; Harkins, McGarry, and Buis 2013). Clinicians and educators with experience in global health and rehabilitation should assume greater responsibility within their respective professions to integrate and advocate for rehabilitation services for PwD in developing nations. It was not until five years ago, in 2011, that the First Physical Therapy Summit on Global Health was held (Dean et al. 2011), and more recently a second and third such summit in 2014 and 2015, respectively (Dean et al. 2014). Much headway remains to be made in terms of bolstering the professional involvement of the American Physical Therapy Association and the American Occupational Therapy Associations. Although working closely alongside the WCPT and the WFOT, whom have a larger presence in global health and rehabilitation efforts, these American professional bodies offer a limited international reach for constituent involvement in addressing the burden of global disability. Improving opportunities for professional involvement and accountability among PM&R professions in global health initiatives are imperative to create a new culture impacting PwD globally.

WHO Action 2.1, 2.3 – 2.4: Community-Based Rehabilitation (World Health Organization 2011; World Health Organization 2014; World Health Organization 2010). Community-based rehabilitation (CBR) was part of the WHO Global Strategy to provide “Health for All” by the year 2000 (World Health Organization 2004). To date, it has been the subject of much investigation and discussion, yet it has expressed the best approach to delivering rehabilitative care to PwD in rural and remote areas of developing nations where resources and access to care are low, and disability rates are typically high (Cleaver and Nixon 2014; Hartley et al. 2009; Mannan et al. 2012; Mauro et al. 2014). Designed to maximize cost-effectiveness, the CBR model focuses on the implementation of five major components for PwD: 1. Health, 2. Education, 3. Work, 4. Empowerment, and 5. Social participation (World Health Organization 2004). Formally, CBR is defined as a strategy for the “rehabilitation, equalization of opportunities, and challenge, to positively affect profession-wide leadership, development, and implementation of new standards within academia that incorporate an increased awareness of global disability (Bethge et al. 2014; Butteris et al. 2015; Cassady et al. 2014; Chermak 1990; Dean et al. 2011; Dean et al. 2014; Evert et al. 2007; Grant 1998; Haig 2007; Harkins, McGarry, and Buis 2013). Clinicians and educators with experience in global health and rehabilitation should assume greater responsibility within their respective professions to integrate and advocate for rehabilitation services for PwD in developing nations. It was not until five years ago, in 2011, that the First Physical Therapy Summit on Global Health was held (Dean et al. 2011), and more recently a second and third such summit in 2014 and 2015, respectively (Dean et al. 2014). Much headway remains to be made in terms of bolstering the professional involvement of the American Physical Therapy Association and the American Occupational Therapy Associations. Although working closely alongside the WCPT and the WFOT, whom have a larger presence in global health and rehabilitation efforts, these American professional bodies offer a limited international reach for constituent involvement in addressing the burden of global disability. Improving opportunities for professional involvement and accountability among PM&R professions in global health initiatives are imperative to create a new culture impacting PwD globally.

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social inclusion of all PwD, and is based on a participatory process for those living with disabilities, their families, organizations and communities” (World Health Organization 2004; World Health Organization 2001; World Health Organization 2014; World Health Organization 2011). CBR is a model intended to break down rudimentary aspects of the rehabilitation processes into easy to follow steps for family members, caregivers, and those without higher education, and has been shown to be effective in low-resourced settings (Finkenflügel, Wolffers, and Huijsman 2005; Hartley et al. 2009; Mauro et al. 2014; World Health Organization 2011). Collectively, there is great opportunity and potential for the World Confederation for Physical Therapy, the World Federation of Occupational Therapists, and the International Society of Physical and Rehabilitation Medicine (ISPRM) to assemble and take broad ownership of implementing more robust and far reaching CBR programs. Similarly, the development of profession-wide goals that provide means to facilitate research, improve funding, and communication at the international level could be more fully utilized and implemented among developing nations.

WHO Action 2.2: Improve international humanitarian support (World Health Organization 2014). We should strive to empower and encourage pro-bono, volunteer, and non-governmental organization (NGO) involvement in global medical outreach programs (i.e., Doctors Without Borders, OneWorld Health, UNICEF, Health Volunteers Overseas, Free Wheelchair Mission, Handicap International, Healing Hands for Haiti, etc.) and other organizations that place emphasis on sustainable healthcare and the incorporation of PM&R services. This may be achieved through fundraising with charitable foundations to promote increased awareness and involvement of global health opportunities in the community and at higher education institutions. The breadth and depth of opportunities for international service-learning (ISL) programs among universities and academic medical institutions in the developed world for the rehabilitation professions could be more widely expanded. Doing so may promote an increased awareness of the intimacy and impact of global health and disability for health professions students as they enter the workforce, in addition to encouraging future international humanitarian work. Although there are many great rehabilitation professionals engaging in global health humanitarian work, an enormous lag exists compared to other health care professions. Furthermore, this could be a potential area for translational research and knowledge to exist globally, as some underserved and remote areas of the developed world may not be very different from struggling areas of developing nations. This presents a unique opportunity to engage in research, education, and translational knowledge that may hold benefits for both the host and target nation (Pablos-Mendez and Shademani 2006; Santesso and Tugwell 2006).

WHO Action 2.5 – 2.6: Improve and broaden CBR and assistive devices and technology in the developing world (World Health Organization 2014). In accordance with the United Nations (UN) General Assembly

1. The effectiveness of community-based rehabilitation programmes: an impact evaluation of a quasi-randomised trial (Journal of epidemiology and community health

2. CBR: a strategy for rehabilitation, equalization of opportunities, poverty reduction and social inclusion of people with disabilities

3. CBR: a strategy for rehabilitation, equalization of opportunities, poverty reduction and social inclusion of people with disabilities

4. International Classification of Functioning, Disability and Health


6. World report on disability (Lancet)


8. Community-based rehabilitation: opportunity and challenge (The Lancet)


10. World report on disability (Lancet)


Knowledge translation in global health (Journal of Continuing Education in Health Professions)

Knowledge translation in developing countries (Journal of Continuing Education in Health Professions)
Disability-Inclusive Sustainable Development Goals (Tardi and Njelesani 2015), there should be development of profession-wide goals by 2020 for rehabilitation professions involvement in impacting the healthcare management of PwD on a global scale. This aligns with the UN’s Post-2015 Development Agenda, which aims to optimize service delivery and improve CBR strategies among an increasing number of rural and remote locations in developing nations “as access to rehabilitation can be seen as a basic human right” (World Health Organization 2004; World Health Organization 2014; World Health Organization 2011). Likewise, the rehabilitation professions, along with prosthetists and orthotists, are strategically primed to perform high-quality research into the development of contextually appropriate low-tech and low-cost assistive technology/devices for low-resourced regions and developing nations for PwD.

**WHO Action 3.1 – 3.3: Further advancement of the current body of literature** (World Health Organization 2014) should be emphasized by way of high-quality randomized controlled trials and systematic reviews or meta-analyses in order to evaluate and rigorously analyze service delivery and outcome measures of CBR programs (Cleaver and Nixon 2014; Finkenflügel, Wolffers, and Huijsman 2005; Mauro et al. 2014). Likewise, evaluation of environmental and contextual barriers to those with disability should be conducted by country and region through high-quality scientific inquiry. There also remains a great need for culturally appropriate outcomes-based research to identify the most successful rehabilitation models in low- and middle-income countries in order to better understand the most effective and applicable models of treating PwD in the highly dynamic developing world. There does not appear to be a “one size fits all” solution to a problem of this magnitude spanning multiple countries, cultures, economic statuses, and geographic regions. Furthermore, there is a need to rigorously evaluate accessibility to health care for PwD in developing nations as the WHO, UN, NGO’s, and other institutions continually implement new programs. Additionally, standardized outcome measures such as the WHO Disability Assessment Schedule 2.0 should be utilized to collect, standardize, validate, and analyze disability data in developing nations (Kulnik and Nikoletou 2014). Strides should also be made to improve funding opportunities for rehabilitation professionals in order to promote scholarly work in global health, disability, and rehabilitation research in developing nations.

**WHO Action 3.4: Implementation of a capacity building model for training local students and existing rehabilitation providers and nurses in developing nations** (World Health Organization 2014; World Health Organization 2011; Gutenbrunner et al. 2015; Bethge et al. 2014; Cassady et al. 2014; Finkenflügel, Wolffers, and Huijsman 2005; Williams, McMeeken, and McMeeken 2014). For example, physiotherapists and occupational therapists from developed nations could utilize their advanced training and access to resources to train and educate local medical providers, therapists, and nurses in developing nations in order to galvanize their healthcare capacity. This
may be achieved through developing profession-specific educational protocols and objectives, promoting international collaborative agreements between academic institutions worldwide, bolstering ISL programs, increased opportunities for funding, and collaborations between universities and NGO’s. Some organizations have been more highly engaged in this effort than others. For example, Health Volunteers Overseas and Handicap International have professional training and educational programs that invest in local provider capacities to mitigate the gap in rehabilitation services provided to PwD. More robust efforts that mimic these leaders are needed. A recent goal of the International Society of Physical and Rehabilitation Medicine is to “develop appropriate models for physician training and, therefore, involvement and participation in the medical rehabilitation process ensuring that their level of training is optimal for the required community needs.” This is limited to the training of physicians, and the whole spectrum of providers in rehabilitative care is needed in order to more effectively impact the current global need. Academic PM&R professions should employ, and strive to emulate, the WHO capacity building model, in addition to utilizing the US Agency for International Development’s “Training of Trainers” model that have been successfully used in programs like the pediatric newborn resuscitation programs (Makanjuola et al. 2012; Musafili et al. 2013; Williams, McMeeken, and McMeeken 2013; Tryon et al. 2015; Abdullah et al. 2014; Aoun and Johnson 2002; Bazyk et al. 2015).

Conclusion

In summary, a tremendous lag between the PM&R professions’ efforts in global health for PwD was identified in the published literature when compared with other scholarly work on topics such as family medicine, surgery, infectious and tropical disease, and child/maternal global health. To date, most of the published literature has been limited to investigating CBR programs in very few regions of low- and middle-income nations. Academic PM&R professions, in large part, have not been highly engaged on the forefront of global health and rehabilitation for PwD, which pales in comparison to other medical initiatives in the global health arena (Haig et al. 2009; Tinney et al. 2007; Tuakli-Wosornu and Haig 2014). In alignment with the 2011 WHO World Report on Disability, and the more recently outlined 2014-2021 WHO Global Disability Action Plan, it is imperative that there be immediate and coalesced multidisciplinary action by all of the PM&R professions to manage the current and projected scale of global disability.
Clearly, the enormous burden of global disability has been well documented in the literature in recent decades and a problem of this magnitude will continue to be undermanaged until a well-coordinated effort is led by PM&R professions in conjunction with all other healthcare disciplines. As highly trained clinicians from the developed world, we must improve upon our investment in sustainable global health outreach programs in the developing world to assist with the management of the global burden of disability. Knowledge translation and educational programs that focus on a bidirectional flow of evidence-based practice strategies can be greatly beneficial for both the host and the target nations as global health engagements should never be unilateral and western-centric. Acknowledgement of the intimate relationship that exists between host and target nations is essential in cultivating bidirectional knowledge translation health practices. Therefore, aggregating the knowledge base and expertise from the PM&R professions, amassing the necessary resources and funding, conducting high quality research, and delivering well-coordinated programs in low-middle-income nations could not be of higher importance, so much so that it has been referred to as a “professional imperative” (Twible and Henley 2000, 109).

Disclosure

Evan M. Pucillo, PT, DPT serves annually for OneWorld Health as Team Director for the short-term medical outreach trips to Nicaragua. Evan M. Pucillo, PT, DPT also serves on the editorial board for the rehabilitation section of The Journal of Global Health Leadership. Edward C. O’Bryan, MD is the co-founder of OneWorld Health in Charleston, SC, and serves on their board of directors.

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