Health System Strengthening Rehabilitation Framework in Developing and Emerging Economies

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ABSTRACT

Rehabilitation services have proven efficacy in patient management as evident in improvement of physical and cognitive functions; reduction in functional difficulties; improved quality of life and resultant participation and inclusion in society. The increasing number of people living with disabilities makes the need for rehabilitation care very important. However, there are gaps between the need for rehabilitation services, accessibility to the service and utilization of such services. There are unmet needs for rehabilitation worldwide especially in low and middle-income countries. This makes strengthening rehabilitation institutions very important particularly in developing economies where such institutions face huge challenges. Issues of collaborative framework; personnel support framework; expansion framework; and financial support framework were strategically discussed. This paper addressed critical issues surrounding the rehabilitation framework and proffer solutions to the visible barriers facing the accessibility to rehabilitation services. This is hoped to be a panacea for strengthening this institution for better performance and impact with overall aim of reducing incidence of disabilities and enhance economies.

Keywords: Health System, Rehabilitation, Framework, Strengthening, Emerging Economies, Collaborative, Expansion.

INTRODUCTION

The necessity of activities of daily living to health and socio-economic implications cannot be over emphasized. Rehabilitation has demonstrated effective capabilities in assisting the sick to live fulfilled lives possible by improving human functions post disease or trauma, which may be physical and cognitive improvements with overall aim of full and effective participation and inclusion in society. Rehabilitation can also reduce the functional difficulties associated with ageing and improve quality of life; it is likely that everyone at some stage in their life will need rehabilitation services. Rehabilitation is an important health strategy that should be implemented at all levels of the healthcare system and at all levels of care.[1] The increasing number of people

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living with disabilities makes the need for rehabilitation care very important. The great need for rehabilitation cut across races and economies; it varies according to gender, the socio-economic status, the functional status and the geographic region. There could be gap between the need for rehabilitation services, accessibility to the service and utilization of such services.[2] There are unmet needs for rehabilitation worldwide especially in low and middle-income countries. [3-4] Rehabilitation services need to be improved, expanded and strengthened. Physical impairments and disabilities can be reduced in communities if rehabilitation is given the due attention it deserves. Rehabilitation settings can be structured in a way that it will meet the immediate and long-term needs.

The rehabilitation workforce which includes Physiotherapists; Speech Therapists; Occupational Therapists; Audiologist; Prosthetics and Orthotics play central role in rehabilitation administration. Enhancing accessibility to health services means addressing the key constraints related to human resources for health. Assessing the availability of rehabilitation health workers is a critical starting point for understanding the capacity of health systems to meet health-related rehabilitation service. [5] The available workforce for rehabilitation in Eastern Mediterranean, South East Asia and Africa regions is less than a tenth of what is required, meaning a huge gap in service availability. High income countries have workforce densities several times higher than low and middle income countries. [6] The unmet rehabilitation needs due to barriers in accessing services and subsequent poorer health outcomes is prevalent in low and middle income countries. This underscores the need to embrace the health system building blocks as regards rehabilitation so as to achieve the universal health coverage as detailed in Rehab 2030 goals.

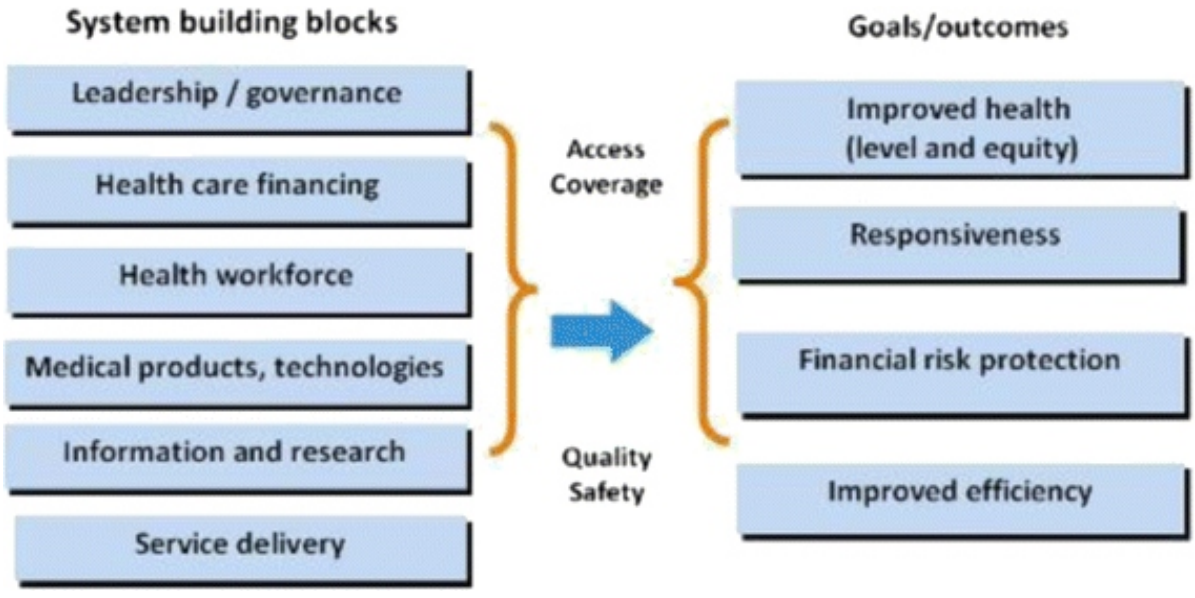

Figure 1: The WHO Health Systems Framework [7]

The low capacity level to address existing needs requires expansion of the present framework (see Figure 1). Thus focusing on strengthening rehabilitation health systems is a right step towards reducing disabilities and helping to maximize people's ability to live, work and learn to their best potential, thus the society benefits in the long run apart from individual benefits.

Financial Support Framework

High quality physical rehabilitation services requires adequate financing if it is going to be easily

accessible. This seems a big challenge and tall order in developing economies like Africa where there is insufficient attention to physical rehabilitation services as evidenced by the limited resources allocated to it; this stems from inadequate political commitments and collaboration of stakeholders. There are financial barriers; infrastructures and expertise for rehabilitation are scarce and poorly coordinated. [3] Resources are needed for infrastructures and expertise on part of the stakeholders; funding of treatment bills on part of the patients and partnership; in all these, a useful workable synergy need to be identified for promotion of rehabilitation services on the continent. It is quite interesting that even in high income countries, rehabilitation services can be improved. [4,8] The need to review the financing system for rehabilitation services; reviving of poorly integrated rehabilitation in primary care and addressing insufficient academic rehabilitation training and insufficient funding for research have been identified. [4] Physical rehabilitation needs have been growing significantly over time, across locations not only in absolute terms, but also per capital and in percentage of Years Lived with Disability (YLDs). This means that not only has physical rehabilitation been growing, but also that it is now capable of averting a higher portion of the global burden of disability. This growing was reported globally and across countries of varying income level with growth being higher in lower income countries, wherein rehabilitation is under-resourced with deprived rehabilitation infrastructures. [9]

As at 2016, physical therapy industry market is quoted as $30 billion industry in USA with 34% expected job increase. Health spending in low income countries was financed primarily by out of pocket spending (OOPS; 44%) and external aid (29%), while government spending dominated in high income countries (70%). The share of health in government spending increased over the past two decades in upper middle and high income countries, stagnated in lower middle income countries and declined in low income countries between 2000 and 2011. [10] In low income countries, 65% of adults with disabilities aged between 18 and 49 years cannot afford health care. Disability and poverty are linked: poverty can result in disability and disability can increase poverty amongst individuals and their families; meaning that people with disabilities are more at risk of being economically underprivileged and less likely to have any form of health insurance systems provided through formal employment, as they have less access to formal jobs. [11] Less than 20 % of people with disabilities in developing countries are employed; thus they have little chance of sustaining decent livelihoods resulting in social exclusion and long term poverty. The economic hours lost by relatives who are caregivers is also a quantifiable and recognizable economic factor worth mentioning as this is caused by possible delays in the hospitals before they can access rehabilitation as a result of inadequate infrastructures and personnel. This on its own makes caregivers to have a second thought of bringing patients to hospitals so that they can pursue their economic life. Thus high possibility of patient worsening condition and development of disabilities which will further require much finances to handle, a sort of cyclical pattern of economic burden with widespread effect on the immediate families. The low level of intake of patients to facilities due to infrastructural size and available manpower do cause long distant appointments being given to patients which can't make treatment as effective as it ought to be, were the patient to be given close appointments; the resultant effect is tendency for disabilities.

Telerehabilitation is reported to have lower costs as compared to in-person rehabilitation for the health care systems and for patients, though the impact of telerehabilitation on long term clinical outcomes and health related quality of life remains unclear. The economic consideration in telerehabilitation can inform decision making by evaluating the costs and effects associated with telerehabilitation as it may reduce barriers in access to care. [12] The concentration of rehabilitation professionals and facilities in major cities increase the financial barriers to rehabilitation in form of travel costs and costs of care hence failure to seek rehabilitation intervention and subsequent physical deterioration and ensuing disabilities.

Physical therapy is vital to healthy living and reduction of disability and can be made an attractive section in healthcare industry through a robust financial options. The following are proffered as possible pathways to solving these financial quagmires. The drawing of individualized redeemable payment instalmental plans for the patient and family support financing, achievable by creating rapport with patient's family and caregivers. Differential social class treatment price regime. These ensure that patient still have holding capital for their daily life without suffering emotional depression because of lack of funds. Rehabilitation structures will benefit from strategic equipment financing loan or short-term rehabilitation business loan granted by banks at flexible repayment plans; banks should see this as part of their corporate social responsibility that can enhance rehabilitation industry and help reduce disabilities on the continent which in turn will positively rub on improved societal work force and increased GDP. The banks of commerce on the continent can formulate a financial policy in this respect and cascade down to sister countries.

Collaborative Framework

Care of patient usually requires a multidisciplinary approach. To foster this, a collaborative effort across health care teams is often encouraged. In this respect, collaboration can be multisectoral and or interdisciplinary for the well-being of the patient. The building blocks of health system strengthening in the World Health Organization framework that describes health systems in terms of six core components or "building blocks", which includes health workforce and service delivery bring this to bear; others are health information systems, access to essential medical products and technologies, financing, and leadership/governance. Service delivery at all levels of care (tertiary, secondary and primary healthcare systems) should encourage and foster the multidisciplinary approach with encouraged ease of consultation.

Comprehensive service delivery includes rehabilitative services which are often rendered by rehabilitation teams as important members of health workforce. Rehabilitation ensures community reintegration and improved quality of life. In order to provide quality care across a wide spectrum and throughout the life cycles of individuals, strong collaboration among members of health workforce is of utmost importance. Health workforce can be defined as "all people engaged in actions whose primary intent is to enhance health". The service delivered by these ones include diagnosing illnesses, healing, caring for people, monitoring health outcomes, supporting treatment adherence, providing medical information and preventing diseases. [13,14] Rehabilitation professionals are involved in all these areas of service delivery. Other human resources include clinical staff, such as physicians, nurses, pharmacists and dentists, as well as management and support staff, i.e. those who do not deliver services directly but are essential to the performance of health systems, such as managers, ambulance drivers and accountants. Healthy collaboration within human resources facilitates a health system that is proactive and result-oriented.

Rehabilitation teams need not work in isolation but collaborate with other members of the health care team for the good of individual patient. For example, research has shown that early referral for physiotherapy proved efficient in patient's management, while reliance on refferals from physicians delay total recovery due to late access to physiotherapy. [15] This is largely because the knowledge and awareness of physicians influence the pattern of referrals for rehabilitation [16] with physicians practicing for five and longer years having more positive perception on referral. [17] This is evident across other rehabilitation sectors, [18] audiology, [19,20] orthotics and prosthesis. [18] With the limited number of available health workforce in developing economies, it is imperative to take into cognizance empowerment of individual patient towards achievement of healthy living and independence.

Collaboration of rehabilitation specialists with family, friends, carers, institutions such as non-governmental organizations; faith based organizations; philanthropists; drug companies and influential ones in the society can enhance service

delivery and availability of rehabilitation products, technology and health finance. This collaboration should go beyond the care facility and extend to communities and homes. Community outreach programmes during which rehabilitation needs can be identified and solutions proffered can be organized. Care tailored to individual patients, continuing rehabilitation drive and repair of assistive devices as required can then be facilitated.

Framework for Rehabilitation Personnel Support

In most developing countries, access to rehabilitation services differ along geopolitical zones and regions and often generally neglected. [21] There is paucity of information on rehabilitation workforce in most countries. This is evident in the limited number of available rehabilitation professionals in African countries compared to Europe and the United States. [22] Moreso, national planning and review of health-workers usually neglect rehabilitation personnels. [23] The following are necessities to the framework for rehabilitation personnel support.

Improving basic training: Rehabilitation programmes are not yet established in many developing countries. A global survey taken in 2005 revealed that out of 114 countries that participated in the survey, 37 had no known strategy to train rehabilitation personnel while 56 were yet to update their existing program. [24] Setting a standard for the training of rehabilitation professionals is also a huge challenge as all countries are not operating the same level of education and lack requisite personnel to train students. University degrees will be the gold standard but may not be applicable right away in most countries. World Physiotherapy (global body of Physiotherapy member organizations) is currently developing a guide for member organizations for use in setting up baseline university education in physiotherapy but we may have to consider other forms of education. The WHO advocates for mixed or graded levels of training to increase the provision of essential rehabilitation services and suggest that where graded training is used, consideration should be given to career development and continuing education opportunities between levels. [25] Though the complexity of working in resource-poor contexts suggests the importance of either university or strong technical diploma education, [26] professional associations still support minimum standards for training. [27-29]

Training existing personnel: According to the WHO, Primary health-care workers can benefit from broad rehabilitation training (using the biopsychosocial framework proposed by the International Classification of Functions, ICF). [30, 25] In the absence of rehabilitation specialists, health staff with appropriate training can help meet service shortages or supplement services. They suggest for example that nurses and health-care assistants can follow up on therapy services. [31, 25] They opined that training programmes for health-care professionals should be user-driven, need-based, and relevant to the roles of the professionals. [32]

Retaining trained personnel: Ability to retain the trained rehabilitation professionals is of uttermost importance in this instance. The WHO noted that international demand for skills also influence where rehabilitation workers seek work. [33, 34] Health-care workers often relocate from low-income countries to high-income countries, in search of better living standards, political stability, and professional opportunities. [35-38] While most attention has been given to medical and nursing professionals, a wave of physical therapists have also emigrated from developing countries such as Brazil, Egypt, India, Nigeria, and the Philippines. [39,40] Long-term retention of personnel (using various incentives and mechanisms) is fundamental to continuing services. The government should beef up financial rewards for people working in rural areas to attract rehabilitation personnels. Career development plans should be instituted and made attractive for rehabilitation personnels. A good work environment with standard equipment should also be made available for these professionals. These are also supported by the WHO report on Rehabilitation. [25]

Expansion Framework

Universal Rehabilitation coverage is a crucial part of universal health coverage. [41] Rehabilitation services have been defined as a group of interventions aimed at reducing the functional and physical

limitations with the goal of achieving maximum level of independence following temporary or long lasting impairments and disabilities. [42] Its positive effects have been seen in increased level of physical activity and prevention of loss of mobility. [43,44] Its gainful effect on reduced hospital stay and cost benefit for patient's overall treatment bill are inferred from the highlighted positive effects. The increasing number of people with chronic disabling conditions requires rehabilitation services that provisions have not yet been made for. Rehabilitation is a health strategy with the potential to mitigate the negative health consequences of population ageing and the rise of non-communicable diseases. [8] 80% of people with disabilities live in developing countries; 90million people in the developing world suffer from a physical disability. Environmental factors have been identified as both barriers and facilitators to accessing rehabilitation services while impairments (pain, depression) are identified as an additional barrier likewise long travelling distance; lack of access to transport/difficulty accessing transport to attend treatment sessions and road considerations; lack of information on existence of rehabilitation services and no referral; financial constraints and equipment availability. The personal factors (self-motivation, motivation given by Physiotherapist and family support) facilitated access to rehabilitation. These barriers to accessing rehabilitation services do lead to decrease in function, poor mobility, and overall poor quality of life. [45,46]

The expansion framework for rehabilitation is underscored by the need to avoid complexities in the delivery of rehabilitation. In order to enhance widespread but well-coordinated rehabilitation services in Africa, such services should be in nearly all government owned hospitals irrespective of level of duty of care. China followed this model and saw rapid improvement within 30years. [47] The expansion framework for rehabilitation is needed to enhance provision of early treatment; to improve social inclusion through cross sector links and referrals; to increase prevention measures on avoidable disabilities; to enhance early detection of disabilities; to increase the capacity for coordination, monitoring, reporting and implementation of rehabilitation services including community based rehabilitation; to enhance barrier free access to rehabilitation at all levels; to reduce risks of travelling and hazards of patient transfer; to reduce cost of care; to conserve useful economic hours of caregivers and to enhance social capital.

CONCLUSION

The future of rehabilitation financing rests on supportive financing both for the rehabilitation facilities and patients; there should be linkage of rehabilitation strategic plan and policies with framework for future development of rehabilitation. Rehabilitation situation in each clime should be clearly identified and defined. There is need for massive dedicated aids in flow into Africa to assist rehabilitation institutions with view to make them to be within the reach of the needy. There should be enhanced public investment into rehabilitation and renewed strategies to financially strengthen existing rehabilitation facilities. Regional collaboration that enhances continental collaboration should equally be encouraged. Stakeholders in rehabilitation industry should take their prime position and help in provisions of financial assistance to individuals in need of these services. There should be national rehabilitation financial policy with commitment to implementation and regular appraisal in addition to having focused leadership and governance in rehabilitation institutions.

Recommendations

National Rehabilitation Policy is needed in all nations of the world. This should take all stakeholders into consideration. World health system should ensure this as a precondition to enlisting members into World Health Organization. Rehabilitation Leaders should be able drivers of the desired goals of Rehabilitation. Rehabilitation Professionals should be continually trained to meet the immediate and expected rehabilitation needs. Advocacy should be used to promote rehabilitation. Financial allocations to this institution should be on increasing trend as years roll by if the existing and anticipated needs will be met. Rehabilitation Financing should enjoy societal support. Future research works may need to look in

this direction to further assist the rehabilitation services in continents with developing and emerging economies.

Conflict of interest None

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REFERENCES

1. Nugraha B, Gutenbrunner C. Contribution of the scientific field of Physical and Rehabilitation Medicine to improvements in health-related rehabilitation at all levels of the healthcare system: A discussion paper. J Rehabil Med. 2021 Feb. 23; 53(2): jrm00155. doi: 10.2340/16501977-2773.
2. Jang SN, Rhee S, Kim WH, Lee KB, Kim S, Lim J. The continuum of rehabilitation care and the rehabilitation services that are needed by people with severe disabilities. J. Prev Med Public Health.2006 May; 39(3):263-9.
3. Geberemichael SG, Tannor AY, Asegahegn TB, Christian AB, Vergara-Diaz G, Haig AJ. Rehabilitation in Africa. Physical Medicine and Rehabilitation Clinics of North America. 30(4):757-768. DOI:10.1016/j.pmr.2019.07.002. Epub 2019 Sep 5.
4. Spiess AAF, Skempes D, Bickenbach J and Stucki G. Exploration of current issues in rehabilitation from the perspective of healthcare professionals: Switzerland as a case point. September. Health Policy. DOI:10.1016/j.healthpol.2021.09.010).
5. Gupta N, Castillo-Laborde C, Landry MD. Health-related rehabilitation services: assessing the global supply of and need for human resources. BMC Health Services 2011. Research 11, 276. https://doi.org/10. 1186/1472-6963-11-276.
6. WHO. Rehabilitation 2030. A call for action. The need to scale up rehabilitation. July 2018.
7. World Health Organization (WHO). Everybody's business - strengthening health systems to improve health outcomes: WHO's framework for action. WHO; Geneva: 2007.
8. Gutenbrunner C, Nugraha B. Physical and rehabilitation medicine: responding to health needs from individual care to service provision. Eur J Phys Rehabil Med. Feb; 53(1): 1-6. Doi: 10.23736/S1973-9087. 17. 04657-3. Epub 2017 Jan 24.
9. Jesus TS, Landry MD, Hoenig H. Global Need for Physical Rehabilitation: Systematic Analysis from the Global Burden of Disease Study. 2019 March. International Journal of Environmental Research and Public Health 16(6). DOI: 10.3390/ijerph16060980.
10. WHO. Global expenditure on health: Public spending on the rise? 15 December 2021. Meeting Point. ISBN: 9789240041219.
11. Boisgillot A, Botokro RB. Financial access to health care and rehabilitation services. Handicap International Rehabilitation Technical Unit. Humanity and Inclusion Project. 2020. Source. https://asksource.info.
12. Grigorovich A, Xi M, Lam M, Pakosh M, Chan BCF. A systematic review of economic analysis of home based telerehabilitation. 2021. DOI: 10. 1080/09638288.2021.2019327.
13. World Health Organization (WHO). "World health report 2000: health systems: improving performance.
14. World Health Organization. "The world health report: 2006: working together for health."
15. Ehrmann-Feldman D, Rossignol M, Abenhaim LA, Gobielle D. Physician referral to physical therapy in a cohort of workers compensated for low back pain. Phys Ther. 1996; 76(2):1507.
16. Odebiyi DO, Amazu AR, Akindele MO, Igwe SE, Olaogun MOB. Evaluation of the mode of referral of patients for physiotherapy by physicians. AJPARS, vol.2, no.1, June 2010, pp.14_20.
17. Okonkwo UP, Ihegihu EY, Maruf FA, Umunnah JO, Maduagwu SM, Okoye EC, et al.. Physiotherapists' perception of physicians' referral of patients for physiotherapy in the Nigerian health system. *Bull Fac Phys Ther* **26,** 32 (2021).
18. Naidoo U, Ennion L. Barriers and facilitators to utilisation of rehabilitation services amongst persons with lower-limb amputations in a rural community in South Africa Prosthetics and Orthotics International 2019, Vol. 43(1) 95103
19. Bright T, Mulwafu W, Thindwa R, Zuurmond M,

Polack S. Reasons for low uptake of referrals to ear and hearing services for children in Malawi. *PloS one*, 2017, *12*(12), e0188703. https://doi.org/10.1371/journal.pone.0188703

20. Zhang L, Links AR, Boss EF, White A, Walsh J. Identification of Potential Barriers to Timely Access to Pediatric Hearing Aids. JAMA Otolaryngol Head Neck Surg. 2020; 146(1):13-19. doi:10.1001/jamaoto.2019.2877
21. Ottenbacher KJ, Graham JE. The state-of-the-science: access to postacute care rehabilitation services. A review. *Archives of Physical Medicine and Rehabilitation*, 2007,88:1513-1521. doi:10.1016/j.apmr.2007.06.761
22. Saxena S. Resources for mental health: scarcity, inequity, and inefficiency. *Lancet*, 2007,370:878-889.
23 Systems thinking for health systems strengthening. Alliance for Health Policy and Systems Research. Geneva, World Health Organization, 2009
24. South-North Centre for Dialogue and Development. Global survey of government actions on the implementation of the standard rules of the equalisation of opportunities for persons with disabilities. Amman, Office of the UN Special Rapporteur on Disabilities, 2006:141.
25 World Health Organization. (https://www.who.int/disabilities/world_report/2011/chapter4.pdf, accessed 21 February 2022)
26. Dunleavy K. Physical therapy education and provision in Cambodia: a framework for choice of systems for development projects. *Disability and* Rehabilitation, 2007,29:903-920. doi:10.1080/09638280701240433 PMID:17577725
27. World Confederation for Physical Therapy [website]. (http://www.wcpt.org/, accessed 21 February, 2022)
28. World Federation of Occupational Therapists [website]. (http://www.wfot.org/schoolLinks.asp, accessed 21 February 2022).
29. Smyth J. Occupational therapy training in Uganda: the birth of a profession. *World Federation of Occupational Therapists Bulletin*, 1996, 34:26-31.
30. Scherer M, Stark S, Bufka L and Reed GM. Three model curricula for teaching clinicians to use the ICF. *Disability and Rehabilitation*, 2008, 30:927-941. doi:10.1080/09638280701800301
31. Atwal A, Caldwell K. Nurses' perceptions of Multidisciplinary perceptions of the role of nurses and healthcare assistants in rehabilitation of older adults in acute health care. Int *Journal of Nursing Practice*, 2006,12: 359-365
32. Fronek P, Booth S, Kendall M, Miller D, Geraghty T. The effectiveness of a sexuality training program for the interdisciplinary spinal cord injury rehabilitation team. *Sexuality and Disability*, 2005, 23:51-63. Doi:10.1007/s11195-005-4669-0
33. Lehmann U, Dieleman M, Martineau T. Staffing remote rural areas in middle- and low-income countries: a literature review of attraction and retention. *BMC Health Services Research*, 2008,8:19- doi:10.1186/1472-6963-8-19
34. Global Health Workforce Alliance [web site]. (http://www.ghwa.org/?74028ba8, accessed 21 February 2022).
35. Landry MD, Ricketts TC, Verrier MC. The precarious supply of physical therapists across Canada: exploring national trends in health human resources (1991 to 2005). *Human Resources for Health*, 2007,5:23-http://www.human-resources-health.com/content/5/1/23 doi:10.1186/1478-4491-5-23
36. World Health Organization. *S*trengthening care for the injured: Success stories and lessons learned from around the world. Geneva, World Health Organization, 2010.
37. Willis-Shattuck M, Bidwell P, Thomas S, Wyness L, Blaauw D, Ditlopo P . Motivation and retention of health workers in developing countries: a systematic review. *BMC Health Services Research*, 2008, 8:247- doi:10.1186/1472-6963-8-247.
38. Magnusson L, Ramstrand N. Prosthetist/orthotist educational experience & professional development in Pakistan. *Disability and Rehabilitation. Assistive Technology*, 2009, 4:385-392.

doi:10.3109/17483100903024634.

39. Oyeyemi A. Nigerian physical therapists' job satisfaction: a Nigeria USA comparison. *Journal of African Migration*, 2002, 1:1-19.
40. Asis M. *Health worker migration: the case of the Philippines*. XVII general meeting of the Pacific Economic Cooperation Council. Sydney, 12 May 2007.
41. Buse K, Hawkes S. Health in the sustainable development goals: ready for a paradigm shift? Glob Health. 2015. 11(1):13.
42. Kamenov K, Mills J-A, Chatterji S, Cieza A. Needs and unmet needs for rehabilitation services: a scoping review. Disabil Rehabil. 2019. 41(10): 1227-1237.
43. Aswegen H, Reeve J, Beach L, Parker R, Olsen MF. Physiotherapy management of patients with major chest trauma: Results from a global survey. 2019. Trauma: 1460408619850918.
44. Moreno NA, de Aquino BG, Garcia IF, Tavares LS, Costa LF, Giacomassi IWS, et al. Physiotherapist advice to older inpatients about the importance of staying physically active during hospitalisation reduces sedentary time, increases daily steps: a randomized trial. J Physiother. 2019. 65(4):208-14.
45. Naidoo U, Ennion L. Barriers and facilitators to utilisation of rehabilitation services amongst persons with lower-limb amputations in a rural community in South Africa. Prosthetic and Orthotics International. July 2018. https://www.Researchgate.net/publication/326616858. DOI.10.1177/0309364618789457.
46. Magapa Q, Ariana P, Polack S. Examining the Availability of Rehabilitation Services in a Rural District of South Africa: A Mixed-Methods Study. Int. J. Environ. Res. Public Health. 2021. 18, 4692. Https://doi.org/10.3390/ijerph18094692.
47. Li J, Leonard SW. Development of Rehabilitation in China. Phys Med Rehabil Clin N Am. 2019. 30 (4) 769-773. November.