Assessment of Rehabilitation Capacity in Ghana

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ABSTRACT

Purpose: *This study describes a cross-sectional assessment of infrastructure, human resources, and types of rehabilitation interventions provided in a sample of healthcare facilities in Ghana. The objectives were to (a) develop and pilot a questionnaire assessing rehabilitation capacity in LMICs, and (b) provide initial data regarding available rehabilitation care in rural Ghana.*

Methods: *Data was collected from a sample of rehabilitation workers at 9 facilities, comprised of 5 regional and 4 district hospitals, located in seven of the ten geographical regions of Ghana. Participants completed a modified version of the World Health Organisation's Tool for Situational Analysis to Assess Emergency and Essential Surgical Care, adapted to reflect core indicators of rehabilitation infrastructure. Participating facilities were mailed questionnaires and agreed to subsequent site visits from the first author.*

Results: *There were several limitations associated with basic rehabilitation infrastructure. Consistent with previous research, significant human resources limitations were observed as hospital-based rehabilitation services were primarily rendered by 20 physiotherapists and 21 physiotherapy assistants across the 9 participating sites. No rehabilitation physicians were identified at any of the surveyed facilities. With regard to therapeutic interventions, management of musculoskeletal impairments was generally consistent with current evidence-based practices, whereas rehabilitative approaches for neurologic conditions were limited to physical rather than sensory-motor modalities.*

Conclusions: *For the first time there is study data which details the rehabilitation infrastructure, human resources, and interventions in Ghana. This study*

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furthers the field through the adaptation and initial piloting of a rehabilitation assessment instrument that can be used in LMIC contexts.

Limitations: *The questionnaire used for the study was modified from the questionnaire for assessing surgical care in resource poor countries, and has not yet been validated. Since the study was conducted in a convenience sample of rehabilitation/physiotherapy centres in Ghana, generalisability may be limited.*

Key words: *Africa, capacity building, delivery of healthcare, access to services.*

INTRODUCTION

Globally, an estimated one billion persons live with disability, with approximately 80% residing in low resource settings (WHO & World Bank, 2011). However, medical rehabilitation services remain under-developed in low to middle-income countries (LMICs) (Haig et al, 2009; Christian et al, 2011). Limited rehabilitation infrastructure, human resources, and unavailability of evidence-based treatments appear to be barriers to enhancing care in low resource settings that are simultaneously experiencing a rapidly increasing burden of trauma-related disability and disabling chronic diseases (Mock et al, 2003; Lemogoum et al, 2005; Connor and Walker, 2007).

The continent of Africa bears 24% of the world's burden of disease but has only 3% of health providers, on a budget of less than 1% of the world's health expenditure (World Health Organisation, 2006). In Ghana, an estimated 12.8% of the population lives with disability (WHO, 2011). This disability prevalence rate is generally consistent with what is observed in sub-Saharan Africa at large, and estimated at 15% or approximately 131 million people (WHO, 2011; World Bank, 2014a).

Sub-Saharan Africa, with its 1.1 billion people, is served by only 6 rehabilitation physicians (physiatrists), all of whom are located in South Africa (Haig et al, 2009). There are an estimated 4,169 occupational therapists (OTs) in Africa, with 75% of them practising in South Africa (World Federation of Occupational Therapists - WFOT, 2011). Data on the number of physiotherapists (PTs) exists for only 15 African countries, ranging from 0.1 per 100,000 people in Ghana and Ethiopia to 6.7 per 100,000 people in South Africa (WHO, 2008). Outside of South Africa and Nigeria, the number of speech therapists in Sub-Saharan Africa remains unknown. The number of social workers and rehabilitation psychologists in low-resource countries ranges from 0.04 per 100,000, and 0.04- 0.06 per 100,000

persons, respectively (Saxena et al, 2007). In fact, these allied rehabilitation medicine professionals are not commonly known specialty services in many parts of Africa.

Additional evidence regarding the capacity to deliver rehabilitation care is necessary for rehabilitation planning and provision of services to reduce the burden of disability. Unfortunately, there are no established rehabilitation capacity assessment tools and many LMICs lack internal systems to assess capacity to provide rehabilitation care. In addition, although studies in high-income settings have assessed the need for rehabilitation services in specific populations, the findings are often not generalisable to low-income settings and thus have restricted usefulness for policy-making in LMICs.

The surgical community faced similar barriers in the assessment of capacity to provide cost-effective essential surgical care in LMICs. Although there were regional and population-based studies done to assess surgical capacity data, findings were not adequate to guide policy and resource allocation. To overcome this barrier, the WHO Global Initiative for Emergency and Essential Surgical Care (WHO, 2009) research group developed a Tool for Situational Analysis to Assess Emergency and Essential Surgical Care in 2007. The original tool was useful for a cross-sectional assessment of the state of surgical care in a given hospital, identifying the strengths, weaknesses, and gaps in four key aspects of the surgical healthcare delivery system: infrastructure, human resources available to provide surgical care, surgical interventions being performed, and emergency equipment available for the care of surgical clients. This standardised tool, originally created by the surgical team, allows for comparison of care within similar regions with similar epidemiology of disease and health. Since its inception, the Tool for Situational Analysis to Assess Emergency and Essential Surgical Care has been used in more than 30 countries, making it the most widely used questionnaire to assess surgical capacity in the world. It has been used and subsequently validated in Ghana with high reliability (Choo et al, 2010; Abdullah et al, 2011; Osen et al, 2011).

The current study is the first one to use a medical rehabilitation adaptation of the WHO situational analysis instrument. Currently, there is limited data regarding the quality and quantity of rehabilitation workers, infrastructure, and services provided in Ghana. Documenting context-specific gaps in rehabilitation capacity would be useful for estimating the unmet need for service provision for persons with disability in Ghana and other LMIC contexts. Therefore, the objective of

the current study was to pilot a tool for assessing the capacity for delivering rehabilitation care in Ghana, with a focus on infrastructure, human resources, and interventions provided.

Approval for this study came from the Ghana Health Services Ethical Committee in Accra, Ghana, and the Johns Hopkins School of Medicine Institutional Review Board, Baltimore, Maryland, USA.

METHOD

Study Design

The study was carried out in multiple regions of Ghana, West Africa. The study team was comprised of international and local Ghanaian medical academic representatives.

A cross-sectional study design was employed, involving administration of a questionnaire.

Study materials were emailed to the directors of 13 physiotherapy departments, identified through the Ghana Physiotherapy Association (GPA), and subsequently there were site visits by the first author. Four facilities did not respond and were unavailable for follow-up.

Inclusion was based on physical accessibility by transportation, availability of the head PT at the time of data collection, and existence of routine record-keeping at the rehabilitation clinic.

Data Collection

Data was collected from a resulting convenience sample of 9 facilities, representing 7 of the 10 geographical regions of Ghana. The regions represented included: (a) Greater Accra-Tema, (b) Eastern Region, (c) Western Region, (d) Central Region, (e) Northern region, (f) Ashanti Region, and (g) Brong Ahafo Region. Although the number of facilities surveyed in this study was low, a large geographic area of the country was represented. The two most populated cities (Accra and Kumasi) were not sampled due to prior concerns that care provided at the 2 teaching hospitals, which provide Physiotherapy services, would not be representative of the country as a whole.

Five of the 10 regional hospitals in Ghana participated in the study. The other

4 participating institutions were district hospitals. All questionnaires were completed by the head of the physiotherapy department of each site. Inclusion criteria required that respondents have knowledge regarding day-to-day operations and any databases maintained by the physiotherapy clinics.

Study Tool

A situational analysis questionnaire, specific for rehabilitation medicine, was designed to provide a cross-sectional assessment of infrastructure, human resources, and types of rehabilitation intervention provided in Ghana. The content was modified on the basis of the World Health Organisation's Tool for Situational Analysis to Assess Emergency and Essential Surgical Care (WHO, 2009; Osen et al, 2011) and contained the following subsections: (1) Infrastructure, (2) Human Resources, and (3) Interventions. The final section of the questionnaire provided respondents with an opportunity to indicate any other opinions regarding the state of rehabilitation services in Ghana.

RESULTS

Infrastructure

All of the participating facilities were public institutions, and were supported with funds from the Ghana Ministry of Health (MOH) / Ghana Health Service (GHS). The number of clients seeking rehabilitation care at participating facilities ranged from 400 to 295,000 annually. Clients travel approximately 22 km on average (range 5-200km) to visit a physiotherapy centre. Only one of the 9 facilities provided inpatient rehabilitation services; the same facility is also the only paediatric rehabilitation centre in the country.

Two of the 9 facilities, had an aquatic therapy gymnasium but one of the aquatic gymnasia was not functional at the time of the data collection. With regard to equipment, 4 facilities were equipped with a physiotherapy gymnasium with capacity ranging from 10 to 20 persons. On an average, there were 5 wheelchairs per centre, ranging from 1 to 20 per facility. Cardiotherapy equipment was available at only 2 sites. Eight out of 9 facilities were equipped with therapeutic ultrasound, Functional Electrical Stimulation (FES), and Transcutaneous Electrical Nerve Stimulation (TENS) machines.

Eight of the 9 facilities reported having a quality assurance/ quality improvement programme; however, these programmes ranged from having established formal

quality assurance/ quality improvement teams at the institution to informal review of client complaints. None of the facilities received inputs from a consumer advisory group or from a Disability Organisation.

Table 1 displays data regarding type of facility, setting, and other indicators of infrastructure such as equipment and available modalities. With regard to basic utilities, 4 of the 9 facilities reported having electricity "sometimes", and another 2 facilities reported having electricity "most of the time" but with instability and frequent power outages. Four of the 9 facilities reported having running water only "sometimes", while the rest reported having the resource "all of the time." Although all centres were funded by Ghana MOH, facility accreditation was provided by multiple oversight institutions. Accreditation came from National Accreditation Board, Ghana Health Service, Social Welfare department, and the National Insurance Authority. Three of the regional hospitals reported no accreditation for rehabilitation care.

Human Resources

The number of rehabilitation therapists is summarised by discipline in Table 1. With one exception, all the participating facilities had PTs. All PTs had professional training and certification, with most (88%) having certification outside of the country. All PTs were members of the GPA. All physiotherapy assistants were trained on the job, with at least a high school equivalent education. There were no rehabilitation physicians, psychologists, or recreational therapists employed by any of the facilities. There was only one OT across all the participating facilities. Six of the 9 facilities lacked social workers. One facility shared a case worker from the hospital, with limited availability. Only one person with a disability was identified as an employee across all of the rehabilitation centres.

Table 1

Human Resources and Infrastructure across 9 Rehabilitation Facilities in Rural Ghana (N=9)

Facility Classification	
Regional hospital	5
District hospital	4
Setting	
Outpatient	8

Inpatient	1
Human Resources (total *n* at all facilities)	
Rehabilitation Physicians Physiotherapists	0 20
Occupational therapists	1
Physiotherapy assistants	21
Case manager/workers	7
Rehabilitation nurse	1
Infrastructure	
Therapy gymnasium	4
Aquatic gymnasium	2
Crutches	7
Walkers	8
Wheelchair	9
FES/TENS	8
US-therapy	8
Exercise table	5
Exercise bike	8
Cardio equipment	2
Weight machines	6

Note. Infrastructure data refers to the number of participating sites with capacity to provide the listed facilities, services, or equipment.

FES=Functional Electrical Stimulation

TENS=Trans cutaneous Electrical Nerve Stimulation

US-therapy=Ultra Sound

Interventions

Table 2 provides an overview of the top 5 conditions treated, with the type of interventions provided and number of clients seen. All facilities had at least limited capacity for rehabilitation of musculoskeletal conditions, as well as trauma and post-surgical care. Availability of general medical rehabilitation services varied by diagnosis; for example, all the facilities provided rehabilitation for burns but none offered cancer rehabilitation. Almost all limb deficiencies and prosthetic needs were referred to one facility which serves more than 6,500 people per year. This facility is about 40 km away from the capital city of Accra.

Three out of the 9 centres had standardised treatment protocols for specific conditions. Almost all facilities provided stroke rehabilitation service only in the form of exercise modalities. All facilities reported limited capacity to provide aphasia, dysphagia, and basic orthotics needs of stroke clients. Only 5 facilities provided rehabilitation for traumatic brain injury (TBI), with limited treatment options outside of physical modalities. Eight of the 9 facilities provided rehabilitation care for persons with spinal cord injury (SCI); however, frontline methods for managing secondary complications of SCI, including spasticity, bowel and bladder management, neuropathic pain, autonomic dysreflexia, and routine health screening were not available. The primary modality reported for spasticity management was range of motion.

All participants reported the need to improve quality of care at the rehabilitation centres. Approximately 68% of the facilities reported having some form of quality assurance programme, but practices varied considerably from review of occasional client surveys to establishment of hospital-based Quality Improvement teams. Priorities for quality improvement, as reported by survey respondents, included: (a) client and physician education for early referrals, (b) petition to the National Health Insurance Scheme to widen coverage for physiotherapy services, (c) need for paediatric rehabilitation specialists, (d) increase in the number of PTs at centres, (e) funding for repair and purchase of equipment, (f) increase general public awareness of rehabilitation services, (g) create comprehensive interdisciplinary team with other health professionals, (h) continuing education for PTs, and (i) expand physiotherapy pre-service training output.

Table 2

Top 5 Classification of Conditions Treated at 9 Physiotherapy Centers in Ghana

	Treatment Provided			
	Exercise/ Modalities	Medications	Surgical	Number per Year
1. Musculoskeletal Degenerative Disc Disease Degenerative Joint Disease Post-surgical/ Trauma	TENS, ROM, exercise, traction, US/ Heat, E-stim	/	/	3824
2. Neurological Stroke Spinal Cord Injury Traumatic Brain Injury	Exercise, ROM, E-stim	/	/	3011

3. Pediatrics Cerebral Palsy Spina Bifida Limb Disorder	Exercise, ROM, E-stim	/	/	535
4. Medical Rehabilitation Cardiac Pulmonary Cancer	Exercise, ROM,	/	/	163
5. Amputation	Exercise, ROM	/	/	58

Note.
/ = does not provide intervention
ROM = Range of Motion
E-stim = Electrical stimulation
U/S = Ultrasound modalities

DISCUSSION

Assessment of Medical Rehabilitation Capacity in LMICs

To the authors' knowledge, this is the first study to formally assess infrastructure, human resources, and capacity to provide comprehensive medical rehabilitation interventions in Ghana. The World Report on Disability (2011) has called on governments to organise, strengthen, and expand comprehensive rehabilitation services and programmes to address the burden of disability and improve quality of life for persons with disability worldwide. The Report specifically highlighted that "global data on the needs for rehabilitation services, type and quality of services provided and estimates of unmet needs do not exist" (WHO & World Bank, 2011). Indeed, very few studies have attempted to quantify medical rehabilitation capacity in low resource countries (Gupta et al, 2011).

The Global Burden of Disease report recommended estimates of rehabilitation needs, based on prevalence of disability, administrative and population data, and disability-specific surveys (WHO, 2004a). However, this approach may not be specific enough to inform policy-makers in developing the capacity to provide rehabilitation intervention at the appropriate time and place. Barriers to measuring capacity of rehabilitation include difference in definitions, classification of measures, population under study, measurement methods, and data sources (WHO & World bank, 2011). In their assessment of the global

rehabilitation workforce, Gupta and colleagues (2011) noted wide dissimilarities across countries and regions in the numbers and dissemination of rehabilitation personnel, and questioned whether the current available data was adequate to allow analysts and decision makers to draw policy-relevant conclusions. It is therefore critical to define and standardise what is meant by "Comprehensive Rehabilitation Care", which is known to be cost-effective elsewhere for regions with a negative supply-need dynamics for rehabilitation care. However, fundamental rehabilitation principles and infrastructure need to be captured to inform stakeholders. Research has shown that standardised frameworks provide the basis for structure, implementation, and outcome measures of rehabilitation interventions globally (WHO, 2011).

The situational analysis tool developed by the WHO Global Initiative for Emergency and Essential Surgical Care to evaluate international surgical capacity has been widely implemented, and has assisted in establishing objective data to document unmet surgical needs. Similar initiatives such as the WHO International Association for Trauma and Intensive Care (WHO-IATSIC) Essential Guidelines for Trauma (Joshipura et al, 2004; Mock et al, 2006) and the WHO Assessment Instrument for Mental Health Systems (WHO-AIMS) Mental Health Assessment (Saxena et al, 2007; Saxena et al, 2011) in many LMICs have led to improved care in their respective fields. These assessment tools were developed through an interactive process that included input from in-country and international experts on the clarity, content, validity, and feasibility of the instrument, as well as pilot trials. The current study is a first step towards developing a tool for wider application in rehabilitation medicine in LMICs.

Infrastructure

Results of the current study suggest that significant limitations exist in rural Ghana with regard to infrastructure for comprehensive rehabilitation care. The following limitations were reported across many of the participating sites: (a) variable accreditation and oversight policies, (b) unstable basic utilities (e.g. equipment), (c) often significant geographic distance for clients to access care, (d) limited availability of basic therapy equipment, (e) inadequate quality assurance procedures, and (f) minimal inclusion of persons with disabilities in programme development. These findings have implications for outcomes of rehabilitation interventions in Ghana. Without appropriate infrastructure in any health system design, human capacity and interventions have limits, and can often

be costly and inefficient. A resource-limited environment needs to have sound policies regarding programme development in order to optimise outcomes of interventions.

All facilities surveyed in this study reported having received financial support from the Ghana MOH, and many of the infrastructure limitations listed above can be linked to the local economic environment. From a health systems finance perspective, the Ghana MOH (2007) has recognised the important relationship between wealth and health, and identified health as an essential component of interventions needed for wealth creation. Overall, Ghana spends approximately 4.8 % of its $39.20 Billion GDP on healthcare cost (World Bank, 2014b). Healthcare is financed through the National Health Insurance Scheme, which was created in 2003. This insurance covers 95% of common pathologies in the country, but no rehabilitation coverage is provided (Agyepong and Adjei, 2008). This lack of coverage is in contrast to international finance data showing rehabilitation to be among the most cost-effective interventions in healthcare, as it is estimated that a dollar spent on rehabilitation yields 10 dollars (Cardenas et al, 2001; Briffa et al, 2005).

Human Resources

Consistent with previous studies (Tinney et al, 2007; Haig et al, 2009), no physiatrist was identified in the current study. The absence of rehabilitation physicians in Ghana and most of sub-Sahara represents a core barrier to providing the comprehensive rehabilitation care consistent with established international standards. In the absence of physiatry, rehabilitation is often provided primarily through PT, occurring primarily in outpatient physiotherapy centres that may or may not be associated with a hospital (Tinney et al, 2007; Haig et al, 2009; Christian et al, 2011). The primary burden of rehabilitation care falls on the PT who is expected to have extensive medical knowledge and appropriate clinical decision-making ability, but often in the absence of adequate resources (Dunleavy, 2007). All PTs interviewed in the current study cited the need to increase the number of PTs in Ghana, and advocated for continual medical education to improve care.

Until a decade ago, all the PTs in the country were trained outside of Ghana. In the year 2000, the College of Health Sciences, University of Ghana, and School of Allied Health Sciences were established to train PTs. The four-year BSc Physiotherapy training model, followed by 1 year of internship, began in 2001 and graduates have provided treatment and education to the growing number of the country's

public and private facilities (Ghana Physiotherapy Association - GPA, 2013). The GPA is also pushing for the creation of a Master's degree programme to meet specialty needs. The number of PTs has recently been estimated at 178 (GPA, 2013) for the whole country. This includes 79 working in government hospitals, 2 in private facilities and 19 working for faith-based organisations. The current study found 20 PTs, one OT, and the absence of any other allied rehabilitation providers (e.g. speech language pathologists, rehabilitation psychologists) across the 9 facilities surveyed. These numbers are striking in the context of the 24 million people residing in the country, and recent estimates of people living with disabilities in the region (WHO, 2011).

In addition, significant disparities exist in health worker distribution across the country; 45% of medical doctors in the country are employed by 2 teaching hospitals (Korle Bu and Komfo Anokye in Accra and Kumasi, respectively), while less than 15% are present in the district hospitals, although more than 65% of the population lives in the districts (Africa Health Workforce Observatory - AHWO, 2010). The Human Resources for Health Country Profile: Ghana (AHWO, 2010) was produced jointly by the MOH of Ghana and its service delivery and Regulatory Agencies, and the AHWO. The objective was to provide a complete representation of the health workforce situation in Ghana, and to strengthen the human resources information system in the country through the establishment of baselines for evidence-based decision making and policy development at both country and Africa Regional levels. These profiles exist for 20 African countries, and 12 more are in development. The data was collected through a standardised template prepared by the Secretariat of the AHWO through consultations. Using a common template enables cross-country comparisons. Unfortunately, development of the report for Ghana was limited by the lack of a comprehensive and accurate database on the health workforce, particularly pertaining to numbers, distribution, historical trends, and attrition (AHWO, 2010). Tools such as the one for rehabilitation piloted in the current study can assist in capturing such data for African leaders in the future.

Interventions

Rehabilitation services reach 1-2% of people with disabilities in LMICs (Frye, 1993). Not far from this number, only 5% of Ghana's estimated 3.6 million persons with disability receive any rehabilitation services (Tinney et al, 2007; Christian et al, 2011). However, by international standards, services provided to this 5% are inadequate and far from the standard of care recommended by the WHO World Report on

Disability. This sub-optimal care was captured using the assessment tool of this study (Table 2). The current study provided a snapshot of quality and breadth of rehabilitation interventions available to clients. Conditions treated included musculoskeletal problems, stroke, SCI, and amputations. Many components of evidence-based rehabilitation were not available for clients, with PTs citing lack of skills and facilities as barriers to care. The piloted assessment tool delineated deficits in infrastructure, human capacity, and interventions for treating common rehabilitation conditions that may not be apparent on the surface.

Overall, rehabilitation interventions for clients with musculoskeletal impairments appeared generally consistent with evidence-based practices. For musculoskeletal impairments, many physiotherapy centres had at their disposal U/S modalities, FES, TENS, and tractions for client management. However, intensive acute hospital-based rehabilitation for persons with trauma and orthopaedic injuries is non-existent in Ghana. Lack of a comprehensive team may limit the optimal potential of rehabilitation gain. For example, clients with spasticity and myofascial / joint pain may benefit from Botox / phenol and trigger-point injections respectively, to reduce pain that will otherwise limit PT interventions targeting increased use of limbs for activities of daily living or mobility.

Stroke, for example, has become a major health concern for sub-Saharan Africa (Kengne and Anderson, 2006; Sagui, 2007). The role of rehabilitation in stroke is to provide education, prevent secondary complications, and improve function through early intensive comprehensive rehabilitation. Though all centres surveyed provide stroke rehabilitation intervention, many interventions to address common stroke-related deficits (e.g. aphasia, dysphagia, cognitive impairment, bowel / bladder care, spasticity, depression) were not provided. Therefore, stroke rehabilitation in this environment addresses physical modalities, but not sensory-cognitive deficits. The lack of comprehensive stroke centres capable of delivering the full spectrum of care to clients with stroke, will lead to predictably worse outcomes. Strong evidence exists to support, comprehensive stroke units (Cadilhac et al, 2004; Koton et al, 2005; Ko and Sheppard, 2006; Walsh et al, 2006). These dedicated units with multidisciplinary rehabilitation teams are associated with reductions in length of stay at hospitals, healthcare costs, death, and dependency, while improving functional outcomes compared to other stroke unit models (Anderson et al, 2000; Moodie et al, 2006; Chan et al, 2013).

Similar to stroke, TBI presents a major problem in Ghana and Sub-Saharan Africa due to epidemiological risk in these regions: violence, motor vehicle accidents,

and falls (Mock et al, 2003). TBI ranks number 1 on the 20 leading non-fatal injuries sustained as a result of road traffic collisions globally (WHO, 2002; WHO, 2004b). Half of the facilities surveyed in the current study reported rehabilitation of clients with TBI by using only physical modalities. The optimal management of a TBI client can be challenging even in multidisciplinary environments, and requires significant understanding of brain pathology, medicine, and rehabilitation principles. It should be noted that the number of TBI clients reportedly seen by facilities in this study was relatively small. This may be due to a lack of screening for TBI following trauma in the acute setting.

Limitations

This study has several limitations. The questionnaire that was developed has been modified from the one used to assess surgical care in resource poor countries, and has not been validated or adopted for use by any local or international body. Additional research in other LMIC settings will be required for further content refinement and psychometric evaluation of the instrument. In addition, the study was conducted in a convenience sample of rehabilitation/physiotherapy centres in Ghana, and therefore generalisability may be limited. This study focussed on the assessment of capacity across rural areas of Ghana, and does not capture the resources or challenges faced in the country's larger cities. Moreover, the current sample does not address the need for assessment of care among persons with disability in the community who have no access to physiotherapy centres and who receive services through community-based rehabilitation instead.

CONCLUSION

To the authors' knowledge, this is the first study that proposes the need to create a standardised tool for comprehensive rehabilitation capacity assessment in Ghana and Sub-Saharan Africa. The study revealed deficiencies in infrastructure, human resources, and ability to provide comprehensive rehabilitation in the regions surveyed. The use of the tool was feasible in the local environment and provided a picture of the capacity to provide comprehensive rehabilitation. It is fair to say that the areas surveyed had "nice looking" physiotherapy buildings, but the capacity to provide comprehensive rehabilitation was limited due to lack of multidisciplinary teams, and perhaps the fact that rehabilitation medicine is not seen as a global health priority in this part of the world.

The need to create a standardised tool to measure rehabilitation capacity in resource-poor countries cannot be overemphasised. Such tools have raised awareness about surgical care as a global health issue, and as a result have improved health outcomes. The creation of effective rehabilitation programmes requires locally relevant research that considers the context, culture, and customs of the environment in which functional impairment and disability occur. This context will better inform local and international agencies about the appropriateness of their resource allocations.

In the absence of objective data detailing the rehabilitation capacity of a country, cost-effective health investment measures are often overlooked, which may end up increasing health-related expenses. Ghana, and similar socioeconomic settings, cannot afford inefficiency in the management of chronic illness and disability. The implications are immense from economic, scientific, clinical, quality of life, and ethical / moral perspectives. Ghana's investment in infrastructure, human resources, and sustainable interventions to establish comprehensive rehabilitation programmes may yield significant benefits, both economically and in terms of the reduction of human suffering. Enhanced infrastructure, in addition to community-based integration programmes, would result in improved survival, better quality of life, and economic benefits to the community at large.

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ANNEXURE – Modified WHO Questionnaire

INFRASTRUCTURE

1. Name, address, phone no. of Physiotherapy centre

   .....

   .....

   .....

2. Type of Physiotherapy centre (Please circle appropriate answer)
   a. Free standing Physiotherapy centre
   b. Dedicated inpatient Rehabilitation centre
      i. Number of beds available .....
   c. Outpatient Rehabilitation centre
   d. Other (explain)

      .....

3. Number of clients served by this facility per year (based on demographics)
   a. Location (town/city) .....
   b. Age
      i. Children(Less than 18 yrs old) .....
      ii. Adult (18 yrs and older) .....
   c. Sex
      i. Male .....
      ii. Female .....

4. Is your facility associated with a Hospital? (Please circle appropriate answers)
   a. Yes
   i. If Yes, which Hospital .....
   ii. Are the different medical departments within the Hospital aware of your services?
      1. Yes
      2. No
   iii. Is there a multidisciplinary rounds/ or consult between your department and other medical departments within the Hospital?

1. Yes. If yes, which one(s)
   .....
   .....
2. No

iv. Which departments within the Hospital provide the most referral to you?
.....
.....

b. No

i. If No, how far is your facility in Kilometres from nearest Hospital centre? .....

ii. Which department(s) within your facility provides the most referral to you?
.....
.....
.....

5. How do people get to know about services provided at your facility?(Please circle appropriate answers)
   a. Referral
      i. By whom/which institution .....
      .....
   b. Advertisement

6. Does your facility interact or receive inputs on services provided from a Disability Organisation? (Please circle appropriate answers)
   a. Yes
   b. No

7. Who financed/finances (supplies, salaries, equipment, etc.) the rehab facility? (Please circle appropriate answers)
   a. Ministry of Health/Ghana health services
   b. Private funding/private businesses
   c. Mission funded/organisation
      i. Which organisation/mission .....

ii. Donor support (e.g. foundations, Non-governmental organisation, etc.)

d. Other (explain) .....

8. How do clients pay for services? (Please circle appropriate answers)
   a. Free
   b. Government insurance
   c. Private insurance
   d. Out of pocket
   e. Other (explain) .....
   .....

9. How many of the following functioning rehab amenities do you have? (Please circle appropriate answers)
   a. Physiotherapy gyms .....
      i. What is the capacity? .....
   b. Occupational Therapy gym .....
      i. What is the capacity? .....
   c. Aquatic Therapy gym .....
      i. What is the capacity? .....
   d. Speech Therapy gym/room .....
      i. What is the capacity? .....
   e. Radiology room
      i. Plain x-ray .....
      ii. Ultrasound .....
      iii. CT scan .....
      iv. MRI .....
   f. Other (explain) .....

10. How many of the following equipment(s) do you have at your facility for clients' use?

Equipment	Number	Do you prescribe(Yes/No)
a. Wheel chair		
b. Crutches		
c. Walkers		

d. Electrotherapy (FES, TENS)		
e. Therapeutic Ultrasound		
f. Transfer board		
g. Exercise table		
h. Exercise bikes		
i. Cardio equipment		
j. Training stairs		
k. Weight machine		
List other equipment you own below		
l.		
m.		
n.		
o.		
p.		
q.		
r.		
s.		
t.		
u.		

11. Do you keep medical records? (Please circle appropriate answers)
    a. Yes
        i. If Yes, what kind?
            1. Paper chart(Structure of documentation)
                a. For example, SOAP –Subjective Objective Assessment and Plan
                b. Other(explain) .....
                .....
                .....
                .....
                .....
            2. Electronic records (structure of documentation)
                .....
                .....

.....

3. Electronic and paper records (structure of documentation)

.....

.....

.....

b. No

12. Do you have treatment guidelines for care provided? (Please circle appropriate answers)
    a. Yes
    b. No (please explain why)

.....

.....

.....

.....

13. Does your rehabilitation facility have some kind of quality assurance/quality improvement programmes?(Please circle appropriate answers)
    a. Yes
        i. If yes, please describe it

.....

.....

.....

.....

    b. No

14. Is there a need to improve the quality of rehabilitation care ?(Please circle appropriate answers)
    a. Yes
        i. If yes, Why?

.....

.....

.....

        ii. What step would you recommend to improve the quality of rehab services at your facility?

.....

.....

.....

iii. What are the biggest obstacles to implementing your recommendations?

.....

.....

.....

b. No

15. Is there an accreditation system in place for the existence of your facility(Please circle appropriate answers)
    a. Yes
        i. If yes, who provides the accreditation?

        .....

        ii. How long does the accreditation last?
        iii. What was the last assessment performance (grading) of your facility?
    b. No
16. Do you have running water?(Please circle appropriate answers)
    a. All the time
    b. Sometimes
    c. Not available
    d. Not needed
17. Do you have electricity source?(Please circle appropriate answers)
    a. Yes
        i. If yes, select type
            1. Alternating current .....
            2. Solar Power .....
            3. Generator .....
        ii. How often do you have electricity?
            1. All the time
            2. Sometimes
            3. Not available
            4. Not needed
    b. No

HUMAN RESOURCES

18. STAFF

Staff	No. working full time	No. working part time	Do they need official certification (Y/N)	Belongs to professional association (Y/N) Name
Physiatrist(MD)				
Physical Therapist(PT)				
Occupational Therapist(OT)				
Speech Therapist				
Rehab Psychologist				
PT assistant/tech				
Healthcare assistance				
Case managers/				
Social workers				
Prosthetist/ Orthotist				
Recreational Therapist				
Please list other healthcare providers at your facility (if not listed above)				
Total Staff:				

19. How many people with disability work in your facility? .....
    a. What are their job titles/positions?
    .....
    .....
    .....
    .....

20. EDUCATION

Staff	Educational Experience/Training (please provide training requirement for each staff, with number of years of training required to practise)				
	Informal training (apprentice)	Post-Secondary level (Diploma/ HND)	University course/ Professional School	Medical School	Residency/ Postgrad-uate training
Physiatrist (MD)					
Physical Therapist (PT)					
Occupational Therapist (OT)					
Speech Therapist					
Rehab Psychologist					
PT assistant/ tech					
Healthcare assistance					
Case managers					
Prosthetist/ Orthotist					
Please list other healthcare providers at your facility (if not listed above)					

INTERVENTIONS

Do you provide the services below?

Interventions	Yes/No	Do you refer				Number seeking service/yr.
		Y/N	Reason for referral (if yes)			
			Lack of skills	Lack drugs/ equipment	Location of referral	
Stroke Rehabilitation						
Dysphagia/Swallow evaluation						
Aphasia/Dysarthria						
Traumatic Brain Injury						
Spinal Cord Injury						
Cerebral Palsy (PEDS)						
Spina bifida						
Limb deficiencies						
Traumatic Brain Injury (Peds.)						
Neuromuscular disease						
Burns Rehabilitation						
Connective Tissue and joint disease						
Cancer Rehabilitation						
Disease of bones and joint (Peds.)						
Cardiac Rehabilitation						
Pulmonary Rehabilitation						
Osteoporosis						
Neurodegenerative disorders						
Transverse Myelitis						
Shoulder disorders						
Elbow disorders						
Wrist disorders						
Pelvic and hip disorders						
Knee disorders						
Foot and ankle disorders						
Spine/Degenerative disc disorders(DDD)						

Radiculopathies/Plexopathies						
Post-surgical care (spine surgery)						
Post-surgical care (joint surgery)						
Post-surgical care(trauma)						
Post-surgical care(general)						
General medical rehabilitation (acute functional decline from illness)						
Amputation management						
Electrodiagnostics						
Myopathies						
Spasticity management						
Joint injections						
Botox/phenol injections						

List the 10 most common rehabilitation disorders seen at your facility

Top 10 disorders seen at your facility	**How do you treat**			**Number treated/yr.**
	Exercise/ modalities	**Medications**	**Surgical**	
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				