

ORIGINAL RESEARCH

Towards a Core Set of Clinical Skills for Health-Related Community Based Rehabilitation in Low and Middle Income Countries

Jessica O'Dowd^{1*}, Malcolm MacLachlan², Chapal Khasnabis³, Priscille Geiser⁴

1. Physiotherapist and PhD Researcher in Global Health, Trinity College Dublin, Ireland
2. Professor of Global Health and School of Psychology, Trinity College Dublin, Ireland
3. Department of Essential Medicines and Health Products, WHO, Geneva, Switzerland
4. Head of "Support to Civil Society" Technical Unit, Handicap International, France

ABSTRACT

Purpose: *This research aims to identify a core set of clinical skills for working in a Community Based Rehabilitation (CBR) setting, and to discuss whether they are appropriate for task shifting to a new or an alternative cadre of rehabilitation workers.*

Methods: *The study focussed on work activities relating to the health component of the CBR Matrix. 40 health professionals working in CBR in Low and Middle Income Countries (LMIC) were surveyed to discover the clinical skills that were used most frequently during the past 3 months and to determine which of these skills were deemed most important in a CBR setting.*

Results: *A core set of clinical skills for health-related CBR work in LMIC were identified: advocacy and sensitisation; assessment, monitoring and reporting; behavioural and cognitive interventions; collaboration and referral; communication; continuing professional development; education; gait training; group work; home-based rehabilitation; manual therapy; neurofacilitation techniques; positioning; prescription of strengthening exercises; prescription of stretching programmes; provision of aids, assistive devices and technologies; psychosocial support; recreational therapy; self-care; sensory interventions; supervision; upper body rehabilitation; vocational rehabilitation and working with families.*

Conclusions: *It is possible to identify a core set of health-related CBR skills. These may be considered in the development of training programmes for new*

* **Corresponding Author:** Jessica O'Dowd, Physiotherapist and PhD Researcher in Global Health, Trinity College Dublin, Ireland. Email: odowdje@tcd.ie

or alternative cadres of CBR workers, using a task-shifting model including appropriate support, supervision and referral mechanisms.

Implications: *Further research is required to establish the generalisability of the skills sets identified here, both across contexts and different client groups and their needs. The identification of core sets of skills for other areas of the CBR Matrix - livelihood, social, empowerment and education – could similarly facilitate access to these domains for people with disabilities.*

Key words: *CBR, task-shifting, disability, rehabilitation, core set, skills.*

INTRODUCTION

Community Based Rehabilitation (CBR) is a rapidly growing field. CBR is a strategy within general community development for the rehabilitation, equalisation of opportunities and social inclusion of all people with disabilities (ILO, UNESCO & WHO, 2004). CBR provides persons with disabilities with person-centred services in their local area. The CBR guidelines published in 2010 were a landmark in the continued development of this model of service delivery and community based inclusive development. They introduced a shift towards a multi-sector and multi-stakeholder approach, mobilising all required levels to promote the full and effective participation of people with disabilities. These guidelines are also in line with realising the rights enshrined in the UN Convention on the Rights of Persons with Disabilities (UNCRPD, 2007; World Health Organisation, 2010; International Disability Development Consortium, 2012; Geiser and Boersma, 2013).

These guidelines are ambitious and encompass 5 key areas of the CBR Matrix - health, livelihood, education, social and empowerment. For professionals working in this CBR setting, it is evident that a complex skill mix is required (MacLachlan et al, 2011). The CBR guidelines are not prescriptive, with CBR programmes tailored to the needs of their particular context, with a 'pick and mix' approach to the CBR Matrix's 5 components and sub-elements. In the area of health, CBR work should be guided by Articles 25 and 26 of the UNCRPD, and can make a particular contribution in providing these health services as close as possible to people's own communities, including in rural areas (Article 25c) (UNCRPD, 2007).

There is a severe shortage of workers with appropriate CBR skills in LMIC and this contributes towards prohibiting comprehensive access to CBR in practice.

In the Human Resources for Health (HRH) crisis, the use of task-shifting to new 'mid' or 'lower' level cadres (generally with shorter and narrower training) has proven to be effective in other domains (Scheffler et al, 2009; Callaghan et al, 2010; Fulton et al, 2011; Lassi et al, 2013). The identification of the sort of skills which could be effectively shifted to a cadre whose training is shorter and less expensive, could allow for more efficient and more accessible services for persons with disabilities in both urban and rural settings. The role of the CBR professional is complex and requires a multi-faceted mix of skills and training, encompassing skills from a number of types of professionals (Mannan et al, 2012).

Although there have been calls for research into the competencies required in a CBR setting (Ojwang and Hartley, 2002, World Health Organisation, 2003), research on the clinical skills and competencies required in a CBR setting is still lacking, perhaps because of the professional sensitivities and complexities involved. For the purpose of the current research, a clinical skill is understood as an act with the aim of improving health or quality of life for an individual. This can be across any domain of examination - physical, therapeutic, communication or management (Michels et al, 2012). It can be directly with the individual or with others such as health professionals, family and/or community. A competency is a combination of knowledge and skill which is needed to achieve a task, goal or outcome (Albanese et al, 2008).

The aim of this research was to gain insight from health professionals working in CBR in LMIC into what clinical skills and/or competencies are required in health-related CBR settings. This explorative study sought to take the first steps in identifying what a core set of health-related clinical skills or competencies might incorporate.

METHOD

Study Design

An exploratory descriptive study was chosen with a cross-sectional quantitative survey design. The idea was to ask participants to name skills, rather than respond to the researchers' preconceptions of what these skills might be. A survey was developed to ask CBR professionals what clinical skills, treatments or methods they used most frequently in the last 3 months (a relatively short time period was specified to enhance accuracy of recall) and to rank these in order of importance (Table 1).

Table 1: Survey Instrument

Question	Answer
Please indicate your profession	Nurse / Doctor / Physiotherapist / Occupational Therapist / Speech and Language Therapist / Dietician, Nutritionist / Psychologist / Orthotist, Prosthetist / Other
Years of Experience since qualification	
Highest level of Education achieved	Diploma/Degree/Masters Doctorate/Other
What proportion of your time would you say is spent working with persons with disabilities and/or in the context of Community Based Rehabilitation?	One quarter or less/About half/ Three-quarters/ All of my time/ None of my time
Which country are you working in	
Please tick as many of the categories below of difficulties that apply to persons with disabilities you have worked with during the last 3 months	Vision / Hearing/ Mobility / Communication/ Self-care / Cognition / Upper Body / Other
Please list (in no particular order) 10 clinical skills, treatments or methods you have often used within the context of Community Based Rehabilitation or in a community setting (in the last 3 months)	
Please rank these clinical skills, treatments or methods in order from 1 to 10, with 1 being the one you have used most often and 10 the least often (in the last 3 months)	
Did you feel you had sufficient training or knowledge to carry out the clinical skills you were required to use in the last 3 months?	Yes / No
Do you have any comments about the sort of skills you have used?	
Do you have any comments about using these skills in the context of Community Based Rehabilitation?	

Sampling

A purposeful sampling method was used to target a specific group of CBR professionals, including health professionals working in this setting and CBR workers and managers. CBR networks were approached to act as gatekeepers for this study. These included networks associated with the Disability and

Rehabilitation team of the WHO and the International Disability and Development Consortium (IDDC). Within CBR networks, snowballing/respondent-driven sampling was used. This technique uses a referral system where initial respondents identify further relevant participants known to them (Atkinson and Flint, 2001).

Data Collection, Management and Analysis

An online survey tool was used to allow for responses across a range of regions. Data was analysed using SPSS and Microsoft Excel software. The clinical skills were put forward by respondents as words, phrases or sentences. By analysing these responses, skill categories were developed. Each of these skill categories was named and given a definition based on previous studies, guidelines and academic literature. The respondents' words, phrases or sentences explaining their clinical skills were then placed into the relevant skills categories (Table 2).

Table 2: Categories of Clinical Skills with definitions, and the words, phrases and sentences assigned to each category

(* word, sentence or phrase assigned to more than one category)

Clinical Skill	Definition	ICF Domain	Context mentioned (word, phrase or sentence as answered by respondents)
Activities of Daily Living (ADL) Training	Activities focussed on improving performance and independence of activities of daily living. These can be activities related to personal care such as feeding, dressing, toileting, grooming, bathing, continence, simple mobility and transfers (Coupar et al, 2012). They can also relate to extended activities of daily living such as gardening, cooking, reading (Fletcher-Smith et al, 2013).	Activities	ADL practice ADL training How to eat
Advocacy and Sensitisation	Promote issues related to disability amongst community. This can include strategies aimed to: increase knowledge and awareness of disability issues, reduce stigma, change attitudes and behaviour, reduce barriers, mobilise resources and increase participation in a community (World Health Organisation and ILEP, 2007).	Environmental Factors Personal Factors	Advocacy Advocacy for human rights Advocacy in community Awareness Awareness raising on disability issues (x2)* Awareness raising* Campaign for effective inclusion of disability and development*

			<p>Community development</p> <p>Engaging policy makers to keep leprosy on agenda*</p> <p>Fighting stigma and discrimination: leprosy</p> <p>Improve quality of life empowering children, families, carers, communities*</p> <p>Inclusion/participation</p> <p>Issue information leaflets*</p> <p>Lobbying for partnership with relevant stakeholders</p> <p>Mental health awareness</p> <p>Organise educational talks to promote positive image of people in a disability situation*</p> <p>Parents and community training*</p> <p>Political impact and advocacy</p> <p>Promoting inclusive education*</p> <p>Radio campaigns</p> <p>Raise awareness with parents re: enrolment education*</p> <p>Resettlement and inclusive development education*</p> <p>Sensitisation (x2)</p> <p>Sensitisation in community (x3)</p> <p>Sensitisation in institutions (x7)</p> <p>Sensitisation of families (x2)*</p> <p>Sensitisation of families and communities (x3)*</p>
Assessment, Monitoring and Reporting	Completion of individual person-centred assessments to identify a person's needs, priorities and individualised rehabilitation plans. These plans should be person-centred, goal orientated, realistic, outline what services will be provided and if any referrals are recommended. This also involves the completion of assessment forms and progress notes (World Health Organisation, 2010).	All Body Functions & Structures Activities Participation Environmental Factors Personal Factors	<p>Assessment skills</p> <p>Case notes/filing</p> <p>Clinical reasoning (x2)</p> <p>Close supervision and monitoring</p> <p>Conducting surveys, questionnaires and data tabulations</p> <p>Developing assessment tools</p> <p>Filing and formatting (x2)</p>

			<p>Follow-up Feedback*</p> <p>Initial assessments</p> <p>Interviews (x2)</p> <p>Interview with parents and translator</p> <p>Monitoring (x2)</p> <p>Monitoring with family about child situation</p> <p>Motor skills assessment*</p> <p>Observing</p> <p>Periodic follow-up visits weekly/monthly/quarterly</p> <p>Physical evaluations</p> <p>Preparing reports</p> <p>Questionnaire application</p> <p>Questionnaires, interviews</p> <p>Reassessment and evaluation</p> <p>Report writing</p> <p>Reporting</p> <p>Research/monitoring/evaluation</p> <p>Sensory processing assessment (x2)</p> <p>Supervision / Evaluation*</p> <p>Thorough assessments (lack of past medical history)</p>
Behavioural and Cognitive Interventions	<p>Interventions aimed at improving memory, attention, language, visuospatial activities, processing speed and executive functioning; reasoning and problem solving(Léonie et al, 2010). This also includes behavioural interventions aimed at recognising dysfunctional thoughts and behaviours, discarding and acquiring behaviours and strategies for relapse prevention (Ayerset al, 2014; Galsworthy-Francis and Allan, 2014).</p>	Body Functions & Structures & Activities	<p>Behavioural interventions</p> <p>Cognitive and behavioural therapy</p> <p>Cognitive Skill: Presence of mind and logical thinking</p> <p>Cognitive skills training</p> <p>Cognitive stimulation</p> <p>DBT (Dialectical behavioural therapy)*</p> <p>Follow up behaviour from bad to good</p> <p>How to spell the letters</p> <p>Interact/communication with other children*</p> <p>Improve learning skills (x4)*</p> <p>Learning about shapes</p>

			<p>Matching shapes and colours (x2)*</p> <p>Reading content</p>
<p>Collaboration and Referral</p>	<p>Networking with other organisations to learn about the their work areas, recognise shared interests and concerns, identify duplications and/ or gaps in local services, develop referral pathways and make referrals into services, develop working relationships, to jointly identify local issues and problems and to assist in continuity of care between agencies(World Health Organisation and ILEP, 2007; World Health Organisation, 2010).</p>	<p>Environmental Factors</p>	<p>Assistive device provision*</p> <p>Assistive devices (x2)*</p> <p>Campaign for effective inclusion in disability and development*</p> <p>Causing linkages to development programmes</p> <p>Co-ordination of activities between institutions</p> <p>Co-ordination of promoter and co-ordination work</p> <p>Counselled visual impaired re: uptake mobility and orientation training*</p> <p>Demonstrated mobile physiotherapy staff how to use available infrastructure for therapeutic positioning of cerebral palsy child*</p> <p>Education – schools and universities*</p> <p>Educational activities in schools*</p> <p>Engage partner NGO supervisors</p> <p>Engaging policy makers to keep leprosy on agenda*</p> <p>Eye surgery</p> <p>Facilitate access to technical aids/crutches/canes/tricycles*</p> <p>Facilitate consultation eyepiece*</p> <p>Facilitate orthopaedic surgery*</p> <p>Facilitate the consultation in orthopaedic health*</p> <p>Facilitation mental health consult*</p> <p>Facilitation/management and disability</p> <p>Guided the mobile physiotherapy project staff to focus on active assisted exercises*</p>

			<p>Health clinics</p> <p>Inter-institutional co-ordination (x3)</p> <p>Internal activity co-ordination</p> <p>Lobbying partnerships with relevant stakeholders</p> <p>Mobility aids provision</p> <p>Multi-disciplinary team (MDT)</p> <p>Multi-sectorial involvement</p> <p>Onward referral</p> <p>Operation</p> <p>Ortho therapy</p> <p>Physiotherapy (x3)</p> <p>Promoting inclusive education*</p> <p>Prosthetic provision</p> <p>Provision of aids: crutches, chairs, parallel bars, prosthetic limbs etc.</p> <p>Provision of protective devices</p> <p>Referral</p> <p>Referred persons with physical impairment to receive appropriate mobility aid from government*</p> <p>Sensitisation in institutions (x7)*</p> <p>Speech and language therapy (x2)*</p> <p>Synchronisation with community setting: Making use of the existing infrastructure facility</p>
Communication	<p>Support in development of communication skills; education to families around communication, teaching use of other forms of communication such as sign language, provision of communication devices such as hearing aids, communication boards, referral to SLT and other services, carrying out exercises to improve speech (World Health Organisation et al, 1997; World Health Organisation, 2010).</p>	<p>Body Function & Structure</p> <p>Activities</p> <p>Participation</p>	<p>Changing role playing and speaking (x2)</p> <p>Communication (x2)</p> <p>Communication skills</p> <p>Communication skills: Non-verbal and body language</p> <p>Communication via translator (x2)</p> <p>Correct errors in speech</p> <p>Correct mistakes in speech</p>

			<p>How to speak</p> <p>Interact/communication with other children*</p> <p>Listening skills*</p> <p>Listening*</p> <p>Speaking about some situation*</p> <p>Speaking with persons (x2)*</p> <p>Speech and language development</p> <p>Speech and language therapy*</p> <p>Speech exercises</p> <p>Speech therapy*</p> <p>Talking with families and persons with disabilities*</p>
Continuing Professional Development (CPD)	Ongoing learning based on the professionals' needs which improve their competency of practice. This may include increasing technical knowledge, personal skills and reflective practice (Gutenbrunner et al, 2011).	Personal Factors	<p>Capacity building*</p> <p>Improve learning and skills (x4)*</p> <p>MDT (Multi-disciplinary team)*</p> <p>Self-development (x7)</p> <p>Skill acquisition</p> <p>Training colleagues*</p> <p>Training in calculations and development quotients</p>
Education	The ability to carry out activities which facilitate the learning, transfer and development of: knowledge, skills and attitudes related to disability and related fields which can be theoretical or practical in nature (World Health Organisation and JHPIEGO, 2005).	<p>Activities</p> <p>Participation</p> <p>Environmental Factors</p> <p>Personal Factors</p>	<p>Awareness*</p> <p>Awareness raising of disability issues*</p> <p>Awareness raising*</p> <p>Capacity building*</p> <p>Demonstrate exercises</p> <p>Demonstrated mobile physiotherapy staff how to use available infrastructure for therapeutic positioning of cerebral palsy child*</p> <p>Educating family members*</p> <p>Education</p> <p>Education – schools and universities</p> <p>Educational activities (x3)</p>

		<p>Educational activities in schools*</p> <p>Educational reinforcement (x2)</p> <p>Educational support (x3)</p> <p>Educational support in the home</p> <p>Engaging community volunteers as counsellors</p> <p>Facilitate training to persons affected by leprosy in self-care practice*</p> <p>Facilitated home-based training for caregivers of persons with cerebral palsy / intellectual disability*</p> <p>Family Education*</p> <p>Feedback*</p> <p>Guide mobile physiotherapy project staff – active assisted exercises*</p> <p>Health education</p> <p>Improve learning and skills (x4)*</p> <p>Individual patient exercise booklets put together*</p> <p>Issue information leaflets*</p> <p>Nutrition</p> <p>Organise educational talks to promote positive image of people in situation of disability*</p> <p>Parents and community training*</p> <p>Patient education</p> <p>Portage guide to early education</p> <p>Postural re-education</p> <p>Promoting inclusive education*</p> <p>Raise awareness with parents re: enrolment education*</p> <p>Remedial teaching</p> <p>Resettlement and inclusive development/education</p>
--	--	--

			<p>Sustainable agriculture skills</p> <p>Teaching reinforcement</p> <p>Teaching staff position of cerebral palsy child*</p> <p>Therapeutic skill: Use physiotherapy and psychology knowledge to guide the CBR workers*</p> <p>Train mum in home exercise programme*</p> <p>Training (formal/informal), skill transfer, education</p> <p>Training colleagues*</p> <p>Training of CBR workers</p> <p>Train persons with disabilities in activities of income generation*</p> <p>Training techniques for raising poultry*</p> <p>Training/orientation on income generating activities*</p> <p>Training self-care activities</p> <p>Training to carers*</p> <p>Walking aid education*</p> <p>Workshops with families (x2)*</p>
Environmental Modifications	Facilitate the adaptation and modification of individual environments such as the home, e.g. ramps, accessible toilet facilities, handrails, and/or in a community setting such as access in schools, public areas (World Health Organisation, 2010).	Environmental Factors	<p>Advice on home modifications*</p> <p>Environmental adaptations e.g. ramps*</p> <p>Home adaptation*</p> <p>Housing repairs*</p> <p>Modifications</p>
Fine Motor Rehabilitation	Fine motor skills involve small precise movements. These are usually of the extremities such as: fingers, hand and wrist. Examples of fine motor skills include: writing, colouring in, pinching (Marret al, 2003; Kimmel and Ratliff-Schaub, 2011).	Body Functions & Structures Activities	<p>Colouring in the frame (x4)</p> <p>Dissemble cubes (x3)</p> <p>How to paint/draw*</p> <p>Paint and draw*</p> <p>Writing</p>

Gait Training	Interventions which aim to improve the functional ability of walking (States et al, 2009). This can include task orientated training, strengthening exercises, cardiovascular fitness, weight transfer practice, dual task performance (van de Port et al, 2007; States et al, 2009).	Body Functions & Structures Activities	Balance* Gait re-education (x2) Global functional conditioning exercises* Hand and leg exercises* How to stand and walk How to stand and walk in balance bars (x2) Leg exercises* Mobility skills Postural re-education* Standing exercises Transfer practice Transfer techniques Walk exercises Walking aid education*
Group Work	The planning, development, facilitation and capacity building of groups. These can involve self-help groups and/or rehabilitation groups (World Health Organisation, 2010).	Participation	Group activities Group conformation (x2) Interact/communication with other children* Micro-endeavour workshops (x4)* Micro-endeavour workshops for families (x2)* Workshops with families (x2)*
Home-based Rehabilitation	Rehabilitation provided in the home setting (Cook et al, 2013). This can include home visits, use and adaptation of the home environment and encouragement of persons and their caregivers to continue rehabilitation in the home setting (Couparet al, 2012).	Body Functions & Structures Activities Participation Environmental Factors	Carrying out therapy in home environment Educational support in the home* Encourage mum to do home exercise* Environmental adaptations e.g. ramps Facilitated home-based training to caregivers of persons with cerebral palsy and intellectual disabilities* Facilitative therapy - home based* Home adaptation* Home visits (x5) Rehab therapy in the home (x2)

Manual Therapy	Involves the movement of the neuromusculoskeletal system through joint mobilisation, joint manipulation, soft tissue release and/or neurodynamics(Farrell and Jensen, 1992; Bialosky et al, 2009).	Body Functions & Structure	Joint mobilisations Manual handling Manual therapy Manual work (x2)
Miscellaneous	Words, sentences or phrases that were unsuitable to be categorised as: too general, unsure of meaning or were not a clinical skill.	N/A	Correct mistakes Multiple disabilities therapy Project elaboration Recording daily accounts, incomes/expenditures Rehabilitation therapy (x4) Rehabilitation therapy in rehab room Rehabilitative care
Neurofacilitation Techniques	Techniques which promote and facilitate normal movement and inhibit abnormal movement (Schaechter, 2004). This may include facilitation of key points and normal movements, postural control, techniques to reduce muscle tone such as weight-bearing through affected limbs, and proprioceptive techniques. Bobath neurodevelopmental approach falls under the heading of neurofacilitation (Butler and Darragh, 2001; Schaechter, 2004; Hafsteinsdóttir et al, 2005; Shepherd, 2014).	Body Functions & Structure	Bobath Facilitated sitting and reaching – hemiparesis* Facilitation of normal movement pattern Facilitative therapy - home based* Facilitative therapy (x5) General developmental therapy Neurofacilitation techniques, key points, Bobath, facilitation - developmental delay
Oedema control	Techniques to reduce oedema which is the collection of excess fluid in the interstitium. This can include positioning, exercises, medication, manual techniques (Artzberger, 2014).	Body Functions & Structure	Oedema control methods Oedema management*
Positioning	Encouraging optimal body positioning and postural alignment to: reduce pressure areas, prevent secondary deformities (e.g. joint contractures), and increase functional abilities and comfort. This can include the use of aids, appliances and devices such as seating, standing frames, wedges, wheelchairs, footrests and cushioning (World Health	Body Functions & Structure	Casting* Demonstrated mobile physiotherapy staff how to use available infrastructure for therapeutic positioning of cerebral palsy child* Feeding and positioning Ponsetti treatment for TEV (Clubfoot) Pressure sore management and wound care*

	Organisation et al, 2008; World Health Organisation, 2010).		Set in chair/seating (x2)* Splinting (x6)* Wheelchair adaptations/ measurements*
Provision of Aids, Assistive Devices and Technologies	The provision of or facilitation of referral for mobility devices, prosthetics, orthotics, splints, hearing aids, specialised computer soft and hardware that assist a person in function and participation (World Health Organisation, 2010).	Body Functions & Structure Activities Participation Environmental Factors	Assistive device provision* Assistive devices (x2)* Casting* Set in chair/seating (x2) * Environmental adaptations e.g. ramps* Equipment provision Equipment provision - bath lifts/seats/commodes Facilitate access to aids, crutches, tricycles* Facilitate consultation eyepiece* Home adaptation* Housing repairs* Mobility aids provision Ponsetti treatment for TEV Prosthetic provision Provision of protective devices Provision of aids: crutches, parallel bars, prosthetic limbs Referral to government for mobility aids* Splinting (x6)* Use of local materials Walking aid education* Wheelchair adaptations and measurements*
Psychosocial support	Support aiming to promote and protect psychosocial well-being (Inter-Agency Standing Committee - IASC, 2007).	Participation Personal Factors	Active listening Coaching/counselling* Cognitive behavioural therapy* DBT (Dialectical behavioural therapy)* Listening* Listening skills* Mental health awareness* Facilitation mental health consult*

			<p>Mental psychological support</p> <p>Psychological support (x2)</p> <p>Psychological/emotional support</p> <p>Relaxation</p> <p>Repeated positive motivation</p> <p>Social skill: Establishing relationship with the client</p> <p>Speaking about situation*</p> <p>Speaking with persons (x2)*</p> <p>Talking with families and persons with disabilities*</p> <p>Understanding</p>
Recreational Therapy	<p>A holistic process using a range of play or recreation activities to address physical, emotional, cognitive, and social needs of a person to maintain and improve health, functional abilities, participation in society and quality of life (Carter and Van Andel, 2011; American Therapeutic Recreation Association, 2014). This will often involve incorporating a person's individual interests and community environment into the therapy programme.</p>	Participation	<p>Adaptive/creative skills</p> <p>Colouring in the frame (x4)*</p> <p>How to paint and draw*</p> <p>Interact/communication with other children*</p> <p>Music and dance</p> <p>Paint and draw</p> <p>Play exercises</p> <p>Play therapy</p> <p>Play with children</p> <p>Recreational activities (x4)</p> <p>Recreational activities on beach</p> <p>Recreational activity: accessible beach</p>
Self-care	<p>"Self-care is what people do for themselves to establish and maintain health, prevent and deal with illness" (World Health Organisation, 1998). This can be through maintaining healthy lifestyle with exercise, reducing stress etc., diet and nutrition, environmental factors such as housing and social habits, socioeconomic factors, managing medication and exercise programmes. Skills to promote self-care include providing information, motivation and linking in with support groups where appropriate (World Health Organisation, 2010).</p>	<p>Participation</p> <p>Personal Factors</p>	<p>Facilitate training to persons affected by leprosy in self-care practice</p> <p>Health education*</p> <p>Lecture self-care*</p> <p>Self-care (x6)</p> <p>Training in self-care activities*</p>

Sensory Interventions	Techniques used to affect change on the sensory system. This can include strategies focussing on: touch, proprioception, vision, hearing, vibration, balance, desensitisation, pain, sensory processing, adaptation and substitution (Doyle et al, 2010; Merabet and Pascual-Leone, 2010; Collignon et al, 2011).	Body Functions & Structure	Adaptation Balance* Counselled visual impaired re: uptake mobility and orientation training* Low vision therapy Matching shapes and colours (x2) Pain management (x2) Pain management (x2)* Sensory Integration Sensory Processing Assessments* Sensory re-education Sitting dynamic balance* Treatment for blind
Prescription of Strengthening Exercises	A systematic programme of exercises designed to increase an individual's ability to exert or resist force (Garber et al, 2011; Shepherd, 2014). This can also include stabilisation exercises such as those for the muscles of spine and trunk (Akuthota and Nadler, 2004).	Body Functions & Structure	Ball exercises Cerebral Palsy treatments* Core strengthening (bridging, trans ab) Exercise programmes Global functional conditioning exercises* Guide mobile physiotherapy project staff – active assisted exercises* Hand and leg exercises* Hand exercises (x3)* Laying on floor lift chest up Leg exercises* Muscle exercises Physical rehabilitation for physical disabilities Sitting dynamic balance* Strengthening exercises
Prescription of Stretching Programmes	Movement of a joint and surrounding tissue to increase range of motion or prevent loss of motion (Garber et al, 2011). Stretching can be static (stretch is held for a set period of time) or dynamic (continual movement). It can be an active (by the person), active assisted (with assistance of another person) or passive (full effort of stretch carried out by another person).	Body Functions & Structure	Cerebral Palsy exercises* Passive stretching (x3) Strain counter strain method Stretching (x3)

Supervision	Provide support and promote: reflection, inquiry, collaboration and professional development in recipients of supervision (Zepeda, 2012).	Environmental Factors Personal Factors	Supervision / Evaluation* Supervision of coordinators Supervision of promoters/ community workers Therapeutic skill: Use physiotherapy and psychology knowledge to guide the CBR workers*
Upper Body Rehabilitation	Activities focussed on improving functional use of the upper limb. These may include strategies to increase strength, movement, co-ordination, dexterity, manipulation, grasping, pinching or gripping and/ or reducing muscle tone (Coupar et al, 2012).	Body Functions & Structure Activities	Facilitated sitting and reach: hemiparesis* Hand and leg exercises* Hand exercises (x3) Splint (x6)
Vocational Rehabilitation	Training of skills and knowledge specific to an activity for participation in employment, micro finance or self-employment (World Health Organisation, 2013).	Participation	Income generating projects (x2) Micro-endeavour (Business/ endeavour) Micro-endeavour workshops (x4)* Micro-endeavour workshops with families (x2)* Occupational performance model Productivity Sustainable agriculture skills* Train persons with disabilities in activities of income generation* Training techniques for raising poultry* Training/orientation on income generating activities* Vocational skills training
Working with Families	Working with families to: sensitise on disability issues, training to assist with caregiving and/or rehabilitation programmes where required. This can include primary family members along with extended family members, relatives and friends (World Health Organisation and Alzheimer's Disease International, 2012).	Environmental Factors	Educating family members* Encourage mum in home exercise programme* Family education* Facilitated home-based training to caregivers of persons with cerebral palsy and intellectual disabilities*

			Improve quality of life empowering children, families, carers, communities* Interview with parents and translator* Micro-endeavour workshops to families (x2)* Monitoring with family about child situation* Parents and community training* Raise awareness with parents re: enrolment in education* Sensitisation of families (x2)* Sensitisation of families and communities (x3)* Strong familial support Supporting parents Train mum in home exercise programme* Talking with families and persons with disabilities* Training to carers Workshops with families (x2)*
Wound Care	Prevention, assessment and management of acute and chronic wounds (Lazaruset al, 1994).	Body Functions & Structure	Pressure sore management and wound care* Scar treatment (x2)*

For example, there was agreement on a skill category of “gait training”, with a definition of -“Interventions which aim to improve the functional ability of walking. This can include task orientated training, stretching exercises, cardiovascular fitness, weight transfer practice, dual task performance” (van de Port et al, 2007; States et al, 2009). A sample of answers which were categorised under this heading included: “gait re-education”, “how to stand and walk”, “walking aid education”, and “mobility skills”. Some words, phrases and sentences put forward to explain clinical skills, treatments or methods could be placed in more than one category. For example, “educating families” was placed under the skill categories of “education” and “working with families”. This was completed for all skills (seen in Table 2).

An inter-rater comparison was completed to reduce risk of bias with categorisation of skills. A 95% agreement was achieved between raters for

placement of skills into the skill categories shown in Table 2.

The International Classification of Functioning, Disability and Health (ICF) was used as a framework to classify the categories of skills in terms of their target. Each category was analysed as to whether its aim was to address body structure or functions, activities, participation, environmental factors or personal factors, or whether the target was a combination of these elements. The advantage of using the ICF is that it encapsulates the social model of disability, which is core to CBR values. It also allows for continuity of use in further research into the core set of skills for other non-health elements of the CBR Matrix (livelihood, education, social, and empowerment).

The International Classification of Interventions (ICHI) was also considered for use as a framework. Madden (2012) describes this framework as focussing on what was done, to whom and how. However, it does not encompass the contextual issues of who completed the intervention (the human resource elements), where the intervention took place, or why the intervention was used. While the ICHI approach undoubtedly has value, the context in which tasks are performed and who performed them were in fact, from a task-shifting perspective, of particular interest to the researchers of the current study. Contextual factors and professional politics may be critical considerations as to how certain tasks are integrated into a wider systems perspective (MacLachlan et al, 2014).

The frequency of use of a skill was calculated as the percentage of respondents who reported this skill. The skills were then grouped into the top 10 most frequent skills (these were regarded as high frequency); skills from top 11 to 20 used most frequently (these were regarded as medium frequency) and top 20 onwards (regarded as low frequency).

In order to ascertain the importance of each skill, the mean ranking was identified along with the standard deviation from the mean. Skills which ranked a mean of 1 (most important) to 3 out of 10 (least important) were deemed to be of high importance, 4 to 6 out of 10 were deemed of medium importance, and 7 or higher out of 10 were deemed of lower importance. The significant mean rankings (with a Standard Deviation or SD of less than or equal to ± 2 , Confidence Interval or CI95%) were reported. A skill ranking with a SD of greater than ± 2 was deemed not to have sufficient agreement between raters.

The data was then analysed to make comparisons by geographic regions, and for the two larger professional groups of physiotherapists and occupational

therapists. A clinical skill was determined to be 'core' if a skill was rated to be of medium or high frequency, or ranked as being of medium or high importance.

Ethical approval for this study was received by Trinity College Dublin.

RESULTS

A total of 40 respondents completed this survey (n=40). All respondents had worked within a CBR setting or in a community setting with persons with disabilities in the last 3 months.

Regions

Respondents were working in a range of low and middle income countries and regions.

40% of the respondents were working in Sub-Saharan Africa (SSA) (total n=16) including Uganda (n=5), Sudan (n=8), Burkina Faso (n=1) and South Africa (n=2). 35% of them were working in the Americas (total n=14) including Ecuador (n=11), Bolivia (n=1), Columbia (n=1) and Dominican Republic (n=1). 22% were working in Asia (total n=9) including India (n=5), Sri Lanka (n=1), Indonesia (n=1), Bangladesh (n=1) and Pakistan (n=1). 3% of the respondents were working in Europe.

Types of Professionals

CBR professionals who participated in the survey came from a range of professional backgrounds: physiotherapists (n=12), occupational therapists (n=10), social workers (n=5), nurse (n=1), psychologist (n=1), CBR practitioner (n=1), nursing assistant (n=1), and others/did not specify (n=9). For each region, a minimum of 4 different professional types responded.

Case Mix: Types of Disabilities Dealt with

Professionals reported working with persons who had different types of disabilities, during the last three months. 97.5% (n=39) had worked with persons with mobility issues, 80% (n=32) with persons with communication difficulties, 75% (n=30) with persons with cognitive difficulties, 65% (n=26) with persons with self-care difficulties, 62.5% (n=25) with persons with visual difficulties, 55% (n=22) with persons with hearing difficulties, and 52.5% (n=21) with persons with upper body difficulties. A wide case mix was also seen across all geographical regions.

Skills Identification

Respondents described clinical skills or competencies with a total of 363 words or sentences. These open responses were content analysed to identify similar words/themes, and 29 categories of clinical skills or competencies were established. The categories reported were as follows: Activities of Daily Living (ADL) training; advocacy and sensitisation; assessment, monitoring and reporting; behavioural and cognitive interventions; collaboration and referral; communication; Continuing Professional Development (CPD); education; environmental modifications, fine motor rehabilitation; gait training; group work; home-based rehabilitation; manual therapy; neurofacilitation techniques; oedema control methods; positioning; prescription of strengthening exercises; prescription of stretching programmes; provision of aids, assistive technologies and devices; psychosocial support; recreational therapy; self-care; supervision; upper body rehabilitation; vocational rehabilitation; working with families; and, wound care. The definitions and words and sentences which were allocated to each category can be seen in Table 2.

Skill Frequency

The skills used most often in the last three months are reported in Figure 1.

Eleven words and/or sentences put forward by respondents were categorised as 'miscellaneous' as it was not possible to assign them to any category. The details are under the 'miscellaneous' heading in Table 2.



Figure1: Skills used Most Frequently in the last three months in a CBR setting

Skill Frequency - Geographic Differences

There were differences in the skills reported as having been used most frequently in the geographic regions of Asia, Sub-Saharan Africa and the South Americas, over the last three months. As there was only one response from Europe, this was not included in the geographic analysis (Figure 2).

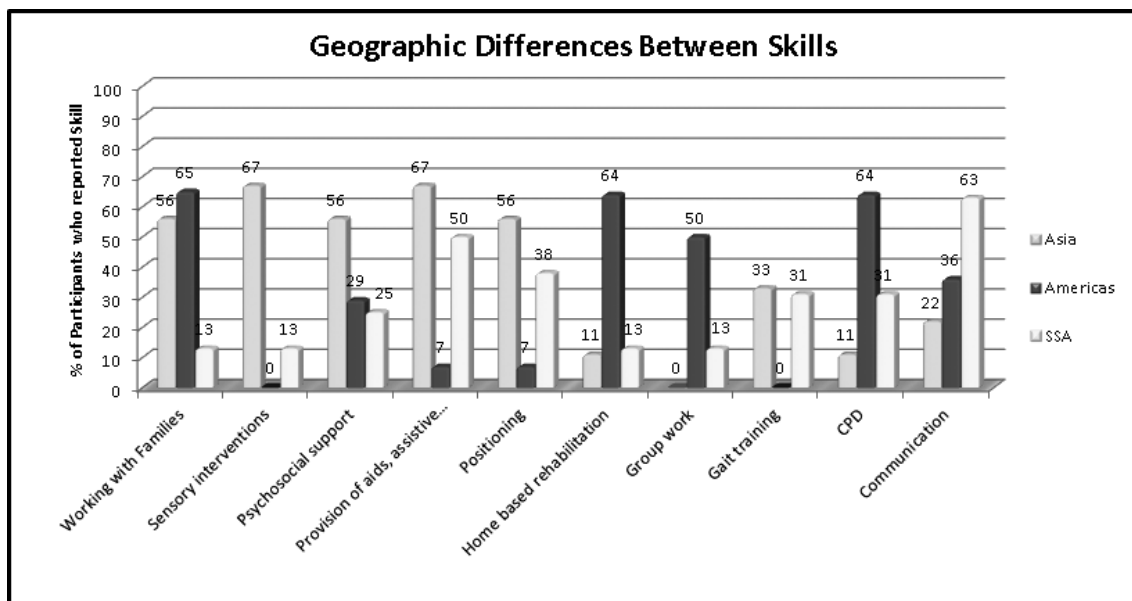


Figure 2: Differences in Most Frequent Skills reported in Asia, the Americas and Sub-Saharan Africa

Skill Frequency - Professional Differences

The skills used were analysed for the larger professional groups of physiotherapists (n=12) and occupational therapists (n=10). A skill was reported if it was among the top 10 skills for this group (Figures 3 and 4).

Skill Frequency relating to the ICF Domains

Of the 29 categories of clinical skills and competencies, 17 targeted only one of the ICF domains: body functions and structure, activities, participation, or contextual factors of environment or personal. 12 targeted more than one ICF domain. Body functions and structure was the target of 16 clinical skills or competencies, activities was the target of 10, participation was the target of 10, environmental factors was the target of 9, and personal factors was the target of 7 (Table 2).

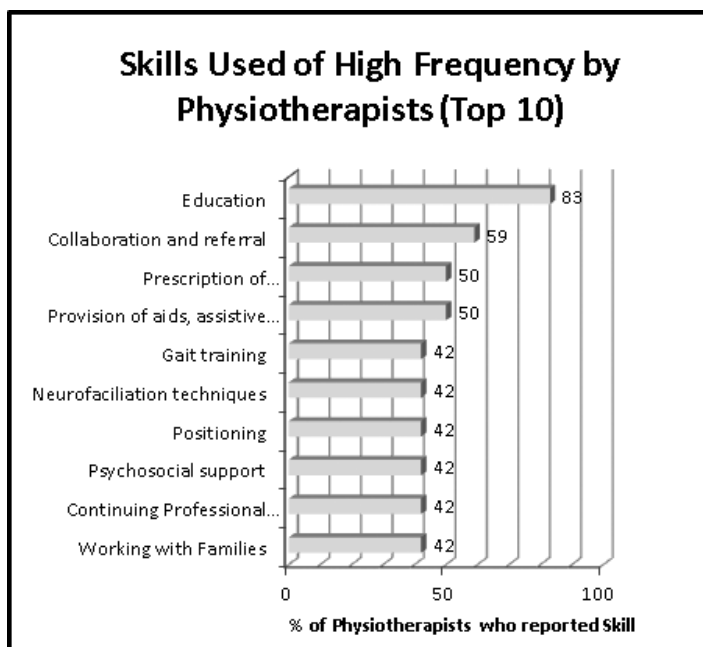


Figure 3: Skills reported Frequently by Physiotherapists

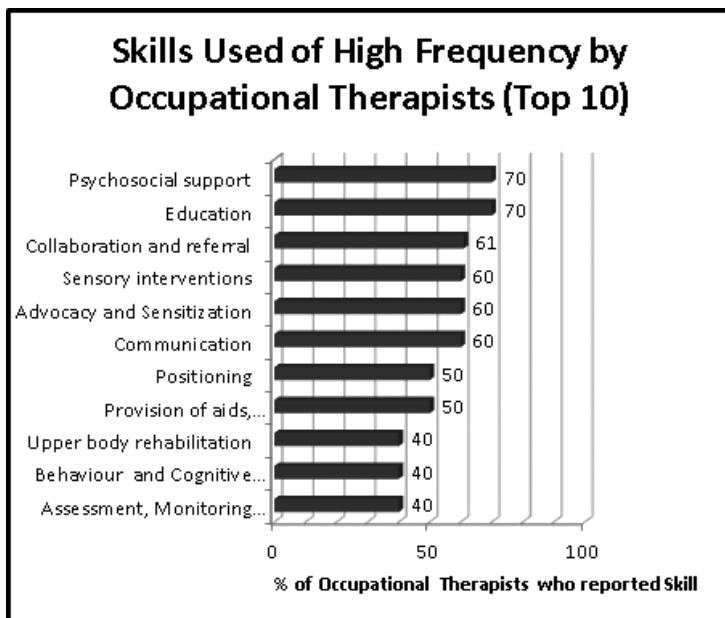


Figure 4: Skills reported Frequently by Occupational Therapists

Importance of Skills

The respondents could rank their skills according to level of importance, with 1 being most important to 10 being least important. Overall, few skills reached a statistically significant consensus on level of importance (agreed as standard deviation of +/-2 from the mean). As shown in Figure 5, the following were consistently deemed to be of higher importance: home-based rehabilitation with a mean ranking of 2 out of 10 (SD 1.61, CI 95%), prescription of strengthening exercises with a mean ranking of 2.7 out of 10 (SD 1.9, CI 95%), and supervision with a mean ranking of 2.5 out of 10 (SD 1, CI 95%). A few skills were also consistently ranked as being of medium importance: behavioural and cognitive interventions scored a mean ranking of 3.6 out of 10 (SD 1.43, CI 95%), manual therapy scored a mean ranking of 4 (SD 2, CI 95%), and neurofacilitation techniques scored a mean ranking of 6.1 out of 10 (SD 1.6, CI 95%). Vocational rehabilitation was consistently ranked as being of lower importance, with a mean ranking of 7.8 out of 10 (SD 1.65, CI 95%).

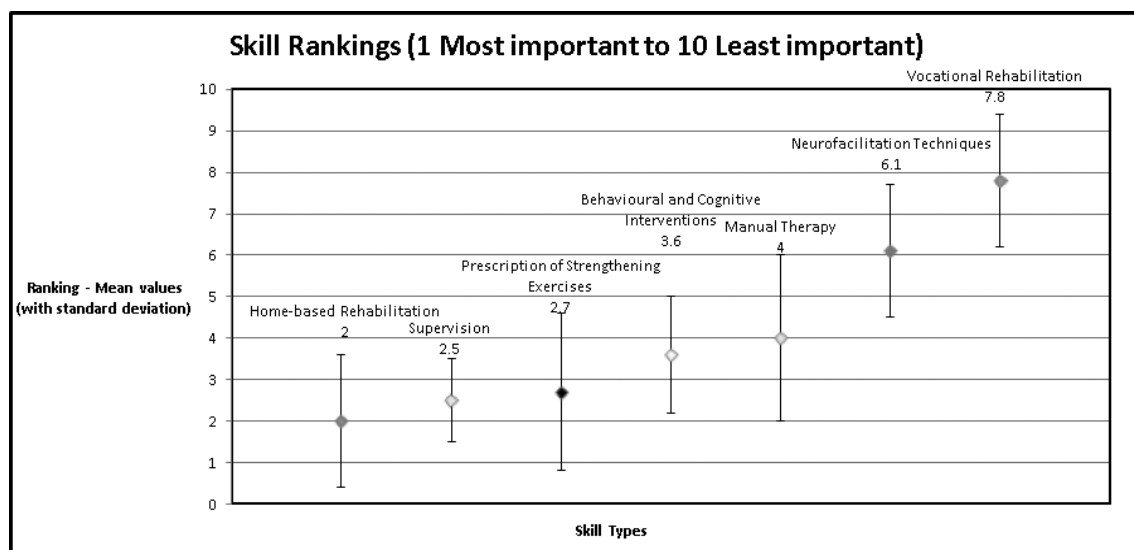


Figure 5: Mean Skill Rankings from 1 to 10

Importance of Skills – Geographic Regions

When the skills were grouped by geographic region, agreement of importance was achieved on some further skills within the regions of Sub-Saharan Africa and Americas (Figures 5, 6 and 7).

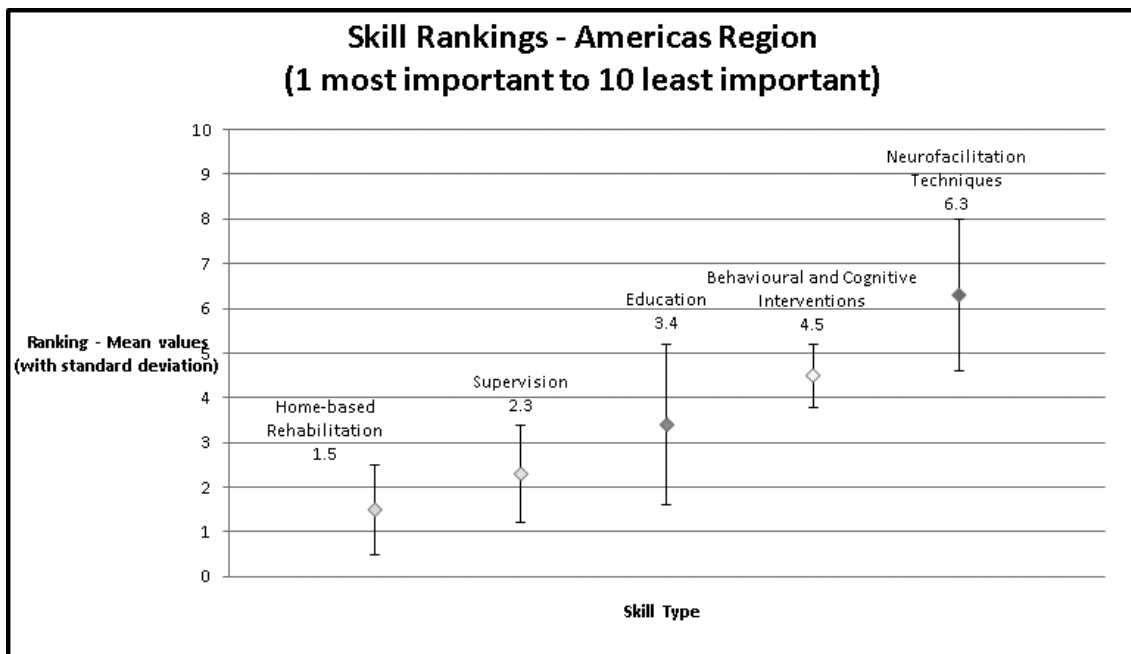


Figure 6: Mean Skill Rankings for the Americas region

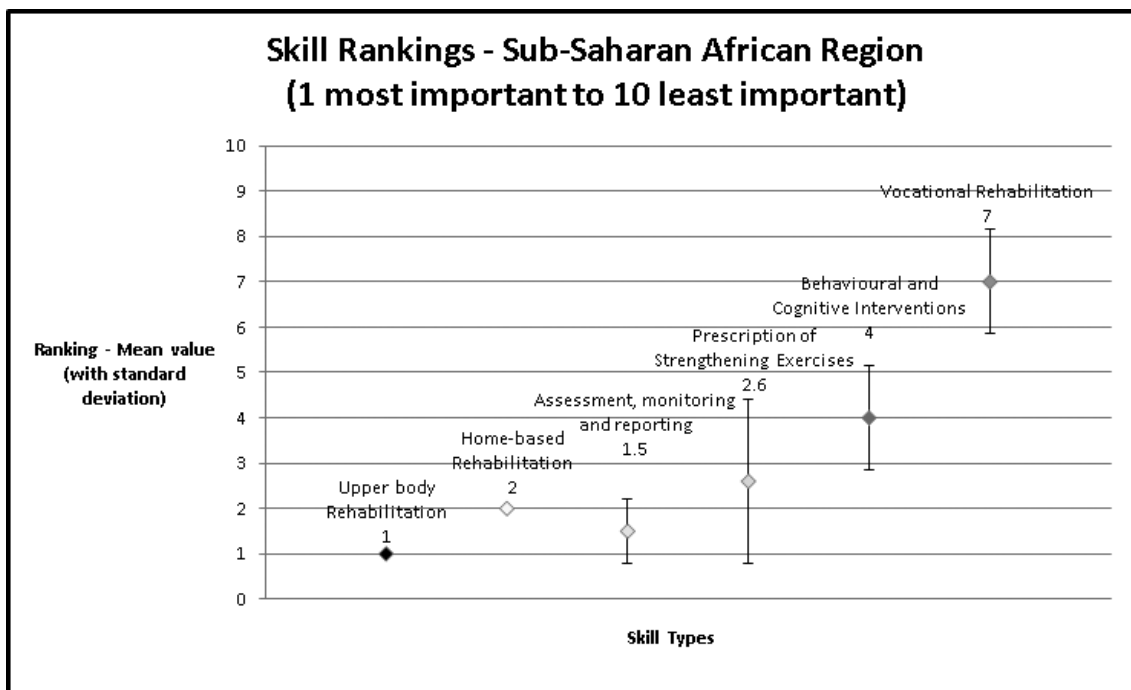


Figure 7: Mean Skill Rankings for SSA region

Importance of Skills – Professional Groups

Within the larger professional groups of physiotherapists (n=12) some agreement on the importance of skills can be seen. Prescription of strengthening exercises was agreed by the physiotherapists who used this skill to be of higher importance with a mean rank of 2 out of 10 (SD 1.8, CI 95%), along with collaboration and referral with a mean rank of 3 (SD 1.7, CI 95%). Positioning was deemed to be of lower importance, with a mean rank of 9.2 out of 10 (SD 1.7, CI 95%). Among the occupational therapists, no consensus was reached on the importance of skills.

The above findings have been synthesised in Table 3, which gives for each clinical skill: frequency mentioned overall, a ranking (if achieved) overall, notable frequency by professional group or region, and whether a ranking was agreed by professional group or by region.

Table 3: Summary of Skills with Overall Frequency, Ranking, ICF Domain, Professional and Regional differences

Skill	ICF Domain	Overall Frequency	Overall Ranking	In Top 10 PT and/or OT Frequency of Skills	PT/OT Ranking	Ranked of high or low frequency in specific Geographic Regions	Geographic Ranking
Collaboration and Referral	Environmental Factors	High	-	PT & OT	PT High	-	-
Education	Activities Participation Environmental Factors Personal Factors	High	-	PT & OT	-	-	Americas High
Advocacy and Sensitisation	Environmental Factors Personal Factors	High	-	OT	-	-	-
Communication	Body Functions & Structure Activities Participation	High	-	OT	-	SSA and Americas High Asia Lower	-
Working with Families	Environmental Factors	High	-	PT	-	Americas and Asia High SSA Lower	-

Provision of aids, assistive devices and technologies	Body Functions & Structure Activities Participation Environmental Factors	High	-	PT & OT	-	SSA and Asia High Americas Lower	-
Continuing Professional Development (CPD)	Personal Factors	High	-	PT	-	Americas High	-
Vocational Rehabilitation	Participation	High	Lower	-	-	-	SSA Lower
Psychosocial Support	Participation Personal Factors	High	-	PT & OT	-	Asia High	-
Positioning	Body Functions & Structure	High	-	PT & OT	PT Lower	Asia and SSA High Americas Lower	-
Recreational Therapy	Participation	High	-	-	-	-	-
Assessment, Monitoring and Reporting	All Domains	High	-	OT	-	-	SSA High
Home-based Rehabilitation	Body Functions & Structures Activities Participation Environmental Factors	Medium	High	-	-	Americas High SSA and Asia Lower	Americas High SSA High
Behavioural and Cognitive Interventions	Body Functions & Structures Activities	Medium	Medium	OT	-	-	Americas and SSA Medium
Prescription of Strengthening Exercises	Body Functions & Structures	Medium	High	PT	PT High	-	SSA High
Neurofacilitation Techniques	Body Functions & Structures	Medium	Medium	PT	-	-	Americas Medium
Group Work	Participation	Medium	-	-	-	Americas High SSA and Asia Lower	-
Sensory Interventions	Body Functions & Structures	Medium	-	OT	-	Asia High SSA and Americas Lower	-
Upper body Rehabilitation	Body Functions & Structures Activities	Medium	-	OT	-	-	Asia Lower SSA High
Prescription of Stretching Programmes	Body Functions & Structures	Medium	-	-	-	-	Asia Medium

Self-care	Participation Personal Factors	Medium	-	-	-	-	-
Gait Training	Body Functions & Structures Activities	Medium	-	PT	-	Americas Lower	-
Fine motor Rehabilitation	Body Functions & Structures Activities	Lower	-	-	-	-	-
Manual Therapy	Body Functions & Structures	Lower	Medium	-	-	-	-
Supervision	Environmental Factors Personal Factors	Lower	High	-	-	-	Americas High
Environmental Adaptations	Environmental Factors	Lower	-	-	-	-	-
Wound Care	Body Functions & Structures	Lower	-	-	-	-	-
Oedema Control	Body Functions & Structures	Lower	-	-	-	-	-
ADL Training	Activities	Lower	-	-	-	-	-

To be considered a core skill or competency it had to be rated to be of medium or high frequency, or ranked as being of medium or high importance. Table 4 below shows a list of the core set of skills and competencies identified.

Table 4: Core set of Clinical Skills and Competencies for CBR Professionals

**Core Set of Clinical Skills and Competencies for CBR Professionals
working in LMIC**

Advocacy and Sensitisation
 Assessment, Monitoring and Reporting
 Behavioural and Cognitive Interventions
 Collaboration and Referral
 Communication
 Continuing Professional Development
 Education
 Gait Training
 Group Work

Home-based Rehabilitation
Manual Therapy
Neurofacilitation Techniques
Positioning
Prescription of Strengthening Exercises
Prescription of Stretching Programmes
Provision of Aids, Assistive devices and Technologies
Psychosocial Support
Recreational Therapy
Self-care
Sensory Interventions
Supervision
Upper body Rehabilitation
Vocational Rehabilitation
Working with Families

Additional Skills for further research and consultation

ADL training
Environmental adaptations
Fine motor rehabilitation
Oedema control
Wound care

DISCUSSION

The researchers set out to establish whether it is possible to identify a core set of health-related CBR skills. The results suggest that patterning of clinical skills can be seen between CBR professionals, and a core set of clinical skills can be defined and described. A clinical skill was understood as an act with an aim to improve health or quality of life for an individual. This can be across any domain of examination, physical, therapeutic, communication or management, and can be directly with the individual or with others such as health professionals, family and/or community (Michels et al, 2012). A competency is a combination of

knowledge and skill which is needed to achieve a task, goal or outcome (Albanese et al, 2008).

The respondents provided open responses to the survey questions as to the skills they used most frequently, and the same and similar skills were frequently put forward (see Table 1 for copy of survey instrument). From these responses, a total of 29 clinical skills have been identified as being used most frequently in a CBR setting. Within these skills, some are used more frequently and deemed to be of higher importance than others. These could be prioritised when developing training programmes for CBR professionals.

Many of the top 10 skills used most frequently tended to be of a generalised nature and were less discipline-specific. For example, within the top 10 skills are included: collaboration and referral; education; advocacy and sensitisation; communication; working with families; Continuing Professional Development (CPD); psychosocial support and assessment, monitoring and reporting. It could be argued that these skills are naturally interdisciplinary, occurring across professional boundaries. These findings could also be argued to support the need within CBR programmes for facilitating access and reducing barriers to society. Within the top 10 skills, using the ICF framework, 6 skills are related to targeting contextual factors of the environment and 5 are related to targeting personal factors. For example, collaboration and referral indicates mobilising and assisting access and use of existing stakeholders, and advocacy and sensitisation may reflect the emphasis placed on changing attitudes and stigma within the local community. The frequent use of these skills - over more traditional health and rehabilitation-related skills - may require the programmes to reflect the higher need for agents of change within the community.

However, a number of skills in the top 10 scoring were more specific, such as: provision of aids, assistive devices and technologies; vocational rehabilitation; positioning; and recreational therapy. These skills can be argued to be specific to certain sets of professionals; however, a trend of frequent use was seen within a CBR setting and across a range of professionals. It could also be noted that these frequently reported skills such as vocational rehabilitation and provision of aids, assistive devices and technologies focussed on participation rather than on impairment-based methods and skills. This supports the inclusion of these skills in training programmes for CBR workers, where task-shifting is being used. However, the practice of skills themselves, while desirable, must also be built into a system that provides a high standard of clinical care. Thus, if these core skills

were to be considered in a task-shifting model of service provision, it would also be important to ensure adequate support and supervision, as well as knowledge of when and how to refer on cases that required interventions beyond these skills (MacLachlan et al, 2011), and to offer longer-term professional development opportunities for such a cadre.

Interestingly, among the skills mentioned frequently, there was consensus in ranking only a few as being of high importance. The skill of prescription of strengthening exercises was mentioned as being of medium frequency and also ranked as being of high importance. Thus, it can be suggested that prescription of strengthening exercises is used frequently and is of high importance to clinicians in this setting. Additionally, the skill of home-based rehabilitation was reported as being of medium frequency and ranked as being of high importance in a CBR setting. The skill of behavioural and cognitive interventions was mentioned with medium frequency and ranked as medium importance, showing that it is also an important skill for CBR professionals.

The skill of psychosocial support which was rated as being of high frequency was also advocated by UNDP, UNFPA, WHO and World Bank (2003) in the context of community support for persons living with HIV, with the suggestion that it should be regarded not as an “add-on” skill but as an integral skill for persons working in communities. The high frequency of use among professionals working in CBR suggests that this skill should be an integral part of CBR training programmes.

The skill of advocacy and sensitisation scores the highest in frequency of use by professionals and suggests the importance of context by addressing environmental and personal factors. This skill focusses on changing mindsets, behaviours and attitudes to create an environment conducive to full and effective participation of people with disabilities. This aligns with IDDC recommendations for CRPD-compliant CBR programmes, enhancing accountability and change at both individual and systemic levels (International Disability Development Consortium, 2012).

Among the clinical skills mentioned as being of medium frequency, there were mainly specific skills such as: behavioural and cognitive interventions; prescription of strengthening exercises; neurofacilitation techniques; sensory interventions; upper body rehabilitation; prescription of stretching programmes; self-care and gait training. These skills all require specific learning, knowledge

and training. More general skills within the medium frequency category include: group work and home-based rehabilitation. These skills could be considered to be traditionally used across professional boundaries.

Among the clinical skills reported as being of lower frequency, most were specific skills. These included: fine motor rehabilitation; manual therapy; environmental adaptations; wound care; oedema control methods and ADL training. Many of these would be specific to one discipline only, which could explain their lower frequency. However they should not necessarily be ruled out of a core set of skills as, within the professions that mentioned them, they were in the top 10 skills most used in the last 3 months. The question here is whether these skills could be taught to CBR professionals or whether they should involve referral to more specialised professionals.

It is also important to note that although these are the skills currently being used in CBR settings, it does not mean that they are best practice or evidence-based. This issue arose during a study of interdisciplinary skills in community rehabilitation in Australia (Kendall et al, 2011). Within this study for example, the clinical skill of neurofacilitation techniques was noted as being of medium frequency and ranked of medium importance. Neurofacilitation is debated for its efficacy as there is lack of a clear evidence base for its use. Within the academic literature, it supports a shift towards task-orientated training for neurological rehabilitation, in particular for persons with cerebral palsy and post stroke (Butler and Darragh, 2001; Richards and Malouin, 2013). The evidence-base of skills is another aspect to be considered when developing training programmes.

This evidence-base for skills is particularly important in the context of CBR evolving towards a holistic response to people with disabilities' needs and priorities, with participation as a goal. The right combination of skills, among the many skills CBR workers could be equipped with to perform their roles across the different components of the CBR Matrix, is a fine balance that should be determined on the basis of the best available evidence and a contextual analysis. These skills should include an appropriate mix of cross-cutting skills (such as advocacy or referral) and those more specific to the areas of health, education, livelihoods, social and empowerment.

There were regional differences in the frequencies of skills used and mentioned, despite the similarity of case mix in the regions. This may be due to social, cultural and contextual factors influencing the presentation of and response to problems

treated in CBR (MacLachlan, 2006). It also may be related to current training programmes in the respective countries and regions.

For example, within the Americas an emphasis on group work was seen. This may be a skill that could be further emphasised within other regions, as in many cases group rehabilitation has been shown to be as effective and less resource intensive than individual therapy (Aprile et al, 2011). In Asia and SSA a high frequency of provision of aids, assistive devices and technologies was seen. This could be due to more access to aids for these regional programmes by public, private or NGO funding, or due to environmental factors such as difficult terrain which make walking without aids difficult for persons with mobility problems. In the Americas and Asia a high frequency of working with families was seen. This may be due to the social and cultural contexts of family units within this region. All these regional differences could be explored in future research for the development of more context-specific sets of skills, and for programmes from different regions to learn from each other.

Analysing clinical skills by a professional group was important, as new or alternative cadres of CBR professionals will need to take a multi-faceted mix of skills from a number of professions; hence, from the perspective of services planning it is important to know what skills can be offered by whom. In this study, the only professional groups who were analysed were the physiotherapists and occupational therapists, as there were insufficient numbers of other professions to undertake meaningful group analysis.

While the internet-based survey of only 40 CBR workers necessarily represents a self-selected sample with access to the internet, the respondents were drawn from a range of professions and locations. It is hoped that this study is a useful step towards identifying a core set of clinical skills for working in health-related CBR settings. However, although the survey was open to all types of health professionals working in CBR, among the respondents there were no doctors, prosthetists, orthotists or speech and language therapists, and so skills from these professions may not be present. It is therefore recommended that future research undertake further skills identification by using similar methods with these types of professionals working in CBR in LMIC settings, and other stakeholders such as persons with disabilities.

Another aspect for further consideration would be to define 'what's good enough' according to the high standards set by the UNCRPD. With the aim of improving

the contribution of CBR in achieving the provisions of the Convention, attention should be paid to developing skills that address the priorities expressed by people with disabilities. For meaningful change to occur, the needs expressed by persons with disabilities must be paramount to any CBR programme. Contextual issues affecting the individual, relating to environmental and personal factors, are of particular importance for consideration in low resource settings. This may be achieved by equipping CBR professionals involved in the health sector with skills, know-how and attitudes that truly enact the UNCRPD principles and obligations. This mindset could be considered a skill in itself for professionals working in CBR and would be integral to effective practice. To complement the findings of this work, assessment could be done of the extent to which people with disabilities are satisfied with the support received from CBR professionals; and, along with more specialised professionals, the skills that best respond to these rights and priorities can be determined.

CONCLUSION

These 29 clinical skills categories that have been identified can be shortlisted based on the inclusion of skills which respondents mentioned as being of high or medium frequency, in addition to the inclusion of skills which were ranked as being of medium to high importance to respondents (see Table 4). While the researchers do not envisage a single unchanging set of skills across all health-related CBR settings, it is believed that empirical evidence identifying core skills across many settings may be helpful in identifying which skills should be a priority for a particular cadre in a particular context. This would be especially useful where task-shifting models of service provision are being considered or strengthened.

REFERENCES

- Akuthota V, Nadler SF (2004). Core strengthening. *Archives of Physical Medicine and Rehabilitation* 85, Supplement 1(0):86-92. <http://dx.doi.org/10.1053/j.apmr.2003.12.005>
- Albanese M, Mejicano G, Mullan P, Kokotailo P, Gruppen, L (2008). Defining characteristics of educational competencies. *Medical Education*; 42 (3): 248-255. <http://dx.doi.org/10.1111/j.1365-2923.2007.02996.x>
- American Therapeutic Recreation Association (2014). Available from: www.atra-online.com/ [Accessed on 6 May 2014]
- Aprile I, Rizzo RS, Romanini E, De Santis F, Marsan S, Rinaldi G, Padua L (2011). Group rehabilitation versus individual rehabilitation following knee and hip replacement: a pilot

study with randomised, single-blind, cross-over design. *Eur J Phys Rehabil Med*; 47 (4): 551-559. PMID:21666574

Artzberger SM (2014). Edema reduction techniques: a biologic rationale for selection. In *Fundamentals of Hand Therapy (Second Edition)*, Ed. Cynthia Cooper. St. Louis: Mosby. <http://dx.doi.org/10.1016/B978-0-323-09104-6.00003-1>

Atkinson R, Flint J (2001). Accessing hidden and hard-to-reach populations: Snowball Research Strategies. *Social Research Update*; 33 (1): 1-4.

Ayers CR, Saxena S, Espejo E, Twamley EW, Granholm E, Wetherell, JL (2014). Novel treatment for geriatric hoarding disorder: an open trial of cognitive rehabilitation paired with behaviour therapy. *The American Journal of Geriatric Psychiatry*; 22 (3): 248-252. <http://dx.doi.org/10.1016/j.jagp.2013.02.010>

Bialosky JE, Bishop MD, Price DD, Robinson ME, George SZ (2009). The mechanisms of manual therapy in the treatment of musculoskeletal pain: a comprehensive model. *Manual Therapy*; 14 (5) : 531-538. <http://dx.doi.org/10.1016/j.math.2008.09.001>

Butler C, Darragh J (2001). Effects of neurodevelopmental treatment (NDT) for cerebral palsy: an AACPD evidence report. *Developmental Medicine and Child Neurology*; 43: 778-790. <http://dx.doi.org/10.1017/S0012162201001414> , <http://dx.doi.org/10.1111/j.1469-8749.2001.tb00160.x>, PMID:11730153

Callaghan M, Ford N, Schneider H (2010). A systematic review of task-shifting for HIV treatment and care in Africa. *Human Resources for Health*; 8:8. <http://dx.doi.org/10.1186/1478-4491-8-8>

Carter M, Van Andel G (2011). *Therapeutic recreation: a practical approach*. 4th Edition. IL, USA: Waveland Press.

Collignon O, Champoux F, Voss P, Lepore F (2011). Sensory rehabilitation in the plastic brain. *Prog Brain Res*; 191: 211-231. <http://dx.doi.org/10.1016/b978-0-444-53752-2.00003-5>

Cook RJ, Berg K, Lee KA, Poss JW, Hirdes JP, Stolee P (2013). Rehabilitation in home care is associated with functional improvement and preferred discharge. *Archives of Physical Medicine and Rehabilitation*; 94 (6): 1038-1047. <http://dx.doi.org/10.1016/j.apmr.2012.12.024>

Coupar F, Pollock A, Legg LA, Sackley C, van Vliet P (2012). Home-based therapy programmes for upper limb functional recovery following stroke. *Cochrane Database Syst Rev*; 5: CD006755. <http://dx.doi.org/10.1002/14651858.CD006755.pub2>

Doyle S, Bennett S, Fasoli SE, McKenna KT (2010). Interventions for sensory impairment in the upper limb after stroke. *Cochrane Database Syst Rev*; 6: CD006331. <http://dx.doi.org/10.1002/14651858.CD006331.pub2>

Farrell JP, Jensen GM (1992). Manual therapy: a critical assessment of role in the profession of physical therapy. *Phys Ther*; 72 (12): 843-852. PMID:1454860

Fletcher-Smith JC, Walker MF, Cogley CS, Steultjens EM, Sackley CM (2013). Occupational therapy for care home residents with stroke. *Cochrane Database Syst Rev*; 6: CD010116. <http://dx.doi.org/10.1002/14651858.CD010116.pub2>

Fulton BD, Scheffler RM, Sparkes SP, Auh EY, Vujicic M, Soucat A (2011). Health workforce skill mix and task shifting in low income countries: a review of recent evidence. *Human Resources for Health*; 9 (1): 1. <http://dx.doi.org/10.1186/1478-4491-9-1>

Galsworthy-Francis L, Allan S (2014). Cognitive behavioural therapy for anorexia nervosa: a systematic review. *Clinical Psychology Review*; 34 (1): 54-72. <http://dx.doi.org/10.1016/j.cpr.2013.11.001>

Garber CE, Blissmer B, Deschenes MR, Franklin BA, Lamonte MJ, Lee IM, Nieman DC, Swain DP (2011). American College of Sports Medicine position stand. Quantity and quality of exercise for developing and maintaining cardiorespiratory, musculoskeletal, and neuromotor fitness in apparently healthy adults: guidance for prescribing exercise. *Medicine and Science in Sports and Exercise*; 43 (7) : 1334-1359. <http://dx.doi.org/10.1249/MSS.0b013e318213fefb> PMID:21694556

Geiser P, Boersma M (2013). The role of the community in CBR. In *Linking CBR, Disability and Rehabilitation*, Eds. G Musoke and P Geiser. Kyambogo, Uganda: CBR Africa Network.

Gutenbrunner C, Lemoine F, Yelnik A, Joseph PA, de Korvin G, Neumann V, Delarque A (2011). The field of competence of the specialist in physical and rehabilitation medicine (PRM). *Annals of Physical and Rehabilitation Medicine*; 54 (5): 298-318. <http://dx.doi.org/10.1016/j.rehab.2011.05.001> PMID:21803672

Hafsteinsdóttir TB, Algra A, Kappelle LJ, Grypdonck MHF (2005). Neurodevelopmental treatment after stroke: a comparative study. *Journal of Neurology, Neurosurgery & Psychiatry*; 76 (6): 788-792. <http://dx.doi.org/10.1136/jnnp.2004.042267>

Inter-Agency Standing Committee (IASC) (2007). IASC guidelines on mental health and psychosocial support in emergency settings. Geneva. IASC.

International Disability Development Consortium (2012). CBR and CRPD guidance note. Available from: www.iddcconsortium.net/resources-tools/cbr-crpd-guidance-note [Accessed on 3 March 2015]

International Labour Organisation, United Nations Educational, Scientific and Cultural Organisation & World Health Organisation (2004). CBR: a strategy for rehabilitation, equalisation of opportunities, poverty reduction and social inclusion of people with disabilities. Joint Position Paper. Geneva: World Health Organisation.

Kendall E, Muenchberger H, Catalano T, Amsters D, Dorsett P, Cox R (2011). Developing core interprofessional competencies for community rehabilitation practitioners: findings from an Australian study. *J Interprof Care*; 25(2): 145-151. <http://dx.doi.org/10.3109/13561820.2010.523651>

Kimmel S, Ratliff-Schaub K (2011). Growth and development. In *Textbook of Family Medicine*. 8th ed., Eds. Rakel RE and Rekel DP. Philadelphia: Saunders Elsevier.

Lassi Z, Cometto G, Huicho L, Bhutta Z (2013). Quality of care provided by mid-level health workers: systematic review and meta-analysis. *Bulletin of the World Health Organisation*; 91: 824-833. <http://dx.doi.org/10.2471/BLT.13.118786>

Lazarus GS, Cooper DM, Knighton DR, Margolis DJ, Pecoraro RE, Rodeheaver G, Robson MC (1994). Definitions and guidelines for assessment of wounds and evaluation of

healing. *Wound Repair and Regeneration*; 2 (3): 165-170. <http://dx.doi.org/10.1046/j.1524-475X.1994.20305.x> PMID:17156107

Léonie J, Bergeron M, Thivierge S, Simard M (2010). Cognitive intervention programmes for individuals with mild cognitive impairment: systematic review of the literature. *The American Journal of Geriatric Psychiatry*; 18(4): 281-296. <http://dx.doi.org/10.1097/JGP.0b013e3181c37ce9>

MacLachlan M (2006). *Culture and Health*. Chichester: Wiley. PMID:PMC1906874

MacLachlan M, Mannan H, McAuliffe E (2011). Staff skills not staff types for community-based rehabilitation. *The Lancet*; 377(9782): 1988-1989. [http://dx.doi.org/10.1016/S0140-6736\(10\)61925-3](http://dx.doi.org/10.1016/S0140-6736(10)61925-3)

MacLachlan M, Gilmore B, McLean C (2014). A realist synthesis of research on rehabilitation human resources. Conducted for the WHO Guidelines Health-Related Rehabilitation Advisory Group. Dublin. Centre for Global Health.

Madden R (2012). WHO Family of International Classifications. Developments and implications for Australia. In ABF Casemix Symposium: Classification Development Toolkit (issues and techniques) 30 November. Available from: <http://sydney.edu.au/health-sciences/ncch/docs/rmadden301112.pdf>. [Accessed on 20 August 2015]

Mannan H, MacLachlan M, McAuliffe E (2012). The human resources challenge to community based rehabilitation: the need for a scientific, systematic and coordinated global response. *Disability, CBR and Inclusive Development*; 23 (4): 6-16.

Marr D, Cermak S, Cohn E, Henderson A (2003). Fine motor activities in head start and kindergarten classrooms. *American Journal of Occupational Therapy*; 57: 550-557. <http://dx.doi.org/10.5014/ajot.57.5.550> PMID:14527117

Merabet LB, Pascual-Leone A (2010). Neural reorganisation following sensory loss: the opportunity of change. *Nat Rev Neurosci*; 11 (1): 44-52. <http://dx.doi.org/10.1038/nrn2758>

Michels MEJ, Evans DE, Blok GA (2012). What is a clinical skill? Searching for order in chaos through a modified Delphi process. *Medical Teacher*; 34 (8): e573-e581. <http://dx.doi.org/10.3109/0142159X.2012.669218>

Ojwang P, Hartley S (2002). Community based rehabilitation training in Uganda: an overview. In *CBR A Participatory Strategy in Africa*, Ed. S Hartley. London: University College London, Centre for International Child Health. PMID:12452464

Richards CL, Malouin F (2013). Cerebral palsy: definition, assessment and rehabilitation. In *Handbook of Clinical Neurology*, Eds. MaryseLassonde Olivier Dulac and BSarnat Harvey: Elsevier. <http://dx.doi.org/10.1016/b978-0-444-52891-9.00018-x>

Schaechter JD (2004). Motor rehabilitation and brain plasticity after hemiparetic stroke. *Progress in Neurobiology*; 73 (1): 61-72. <http://dx.doi.org/10.1016/j.pneurobio.2004.04.001>

Scheffler RM, Mahoney CB, Fulton BD, Dal Poz MR, Preker AS (2009). Estimates of health care professional shortages in sub-saharan Africa by 2015. *Health Affairs*; 28 (5): w849-w862. <http://dx.doi.org/10.1377/hlthaff.28.5.w849> PMID:19661111

Shepherd RB (2014). Annotation A - Aspects of motor training. In *Cerebral Palsy in Infancy*, Ed. Roberta B Shepherd. Oxford: Churchill Livingstone.

States RA, Salem Y, Pappas E (2009). Overground gait training for individuals with chronic stroke: a Cochrane systematic review. *Journal of Neurologic Physical Therapy*; 33(4): 179-186. <http://dx.doi.org/10.1097/NPT.0b013e3181c29a8c> PMID:20208461

UN CRPD (2007). *United Nations Convention on the Rights of Persons with Disabilities*. UN, New York.

United Nations Development Programme, United Nations Population Fund, World Health Organisation and World Bank (2003). *HIV-infected women and their families: psychosocial support and related issues. A literature review*. Ed. Development and Research Training in Human Reproduction. UNDP/UNFPA/WHO/World Bank Special Programme of Research. Geneva: Department of Reproductive Health and Research, Family and Community Health, World Health Organisation.

van de Port IGL, Wood-Dauphinee S, Lindeman E, Kwakkel G (2007). Effects of exercise training programmes on walking competency after stroke: a systematic review. *American Journal of Physical Medicine & Rehabilitation*; 86 (11): 935-951. <http://dx.doi.org/10.1097/PHM.0b013e31802ee464> PMID:17303962

World Health Organisation (1998). *The role of the pharmacist in self-care and self-medication*. Available from: <http://apps.who.int/medicinedocs/en/d/Jwhozip32e/3.1.html> [Accessed on 29 April 2014]

World Health Organisation (2003). *International consultation to review community-based rehabilitation (CBR)*, Helsinki, Finland. In *International Consultation to Review Community-Based Rehabilitation (CBR)*, Ed. World Health Organisation. Geneva.

World Health Organisation (2010). *Community-based rehabilitation: CBR guidelines*. Geneva.

World Health Organisation (2013). *Spinal Cord Injury Factsheet N°384*. Available from: <http://www.who.int/mediacentre/factsheets/fs384/en/> [Accessed on 5 May 2014]

World Health Organisation and Alzheimer's Disease International (2012). *Dementia: a public health priority*. Geneva: World Health Organisation

World Health Organisation and ILEP (Federation of Anti-Leprosy Associations) (2007). *Technical guide on community-based rehabilitation and leprosy*. Geneva: World Health Organisation

World Health Organisation, International Society for Prosthetics and Orthotics and USAID (2008). *Guidelines on the provision of manual wheelchairs in less resourced settings*. Eds. J Borg and C Khasnabis. Geneva: World Health Organisation.

World Health Organisation and JHPIEGO (2005). *Effective teaching: a guide for educating healthcare providers*. Geneva: World Health Organisation.

World Health Organisation, UNICEF and Ministry of Health Zimbabwe (1997). *Let's communicate: a handbook for people working with children with communication difficulties*. Geneva: World Health Organisation.

Zepeda S (2012). *Supervision, professional development and teacher evaluation that make a difference*. In *Instructional Supervision: Applying Tools and Concepts*, Ed. SJ Zepeda. New York: Eye on Education.