Feasibility Assessment of the ICF Minimal Generic Set as a Disability Screening Tool in Rural Nepal

Paul Witte[1*], Suresh Tamang[2], Christine C Groves[3], Darlene R House[4], Laxman Khadka[5], Thorang Bhotia[6], Jeff Hartman[7]

1. Independent Researcher, Tribhuvan University, Nepal
2. Senior Research Coordinator, Nick Simons Institute, Nepal
3. Physical Medicine & Rehabilitation Consultant, Spinal Injury Rehabilitation Centre, Nepal
4. Associate Professor, Clinical Emergency Medicine & Paediatrics, Indiana University School of Medicine, USA
5. Ministry of Health & Population, Nepal
6. B.P. Koirala Institute of Health Sciences, Nepal
7.Asst Professor, Physical Therapy Programme, University of Wisconsin School of Medicine & Public Health, USA

ABSTRACT

***Purpose**: Nepal's 2017 Disability Rights law provided a new national definition of disability consistent with the UN Convention on the Rights of Persons with Disabilities (CRPD). Updated measurement methods are now indicated to assess disability, suitable for use in populations where self-report tools may be sub-optimal. This study describes the development and field testing of a screening methodology using a clinical assessment conducted by trained non-professionals to score the ICF Minimal Generic Set (MGS).*

***Method**: A prospective, 2-stage assessment of disability was conducted over an eight-month period among a convenience sample of individuals aged ≥ 18, admitted to a rural District Hospital in Northeastern Nepal. After 30 hours of training, non-professional assessors completed Stage 1 screening during hospital admission, with positive screening thresholds set on the basis of MGS scores. A physiotherapist completed Stage 2 assessments in the homes of participants with long-term disability, after their hospital discharge.*

***Results**: Data from 161 participants was analysed, with 159 (98.8%) screening positive for either temporary or long-term disability. Stage 1 screening was completed independently by assessors in 8-12 minutes. Of the 35 participants (21.7%) with positive screening for long-term disability, 13 (37.1%) underwent Stage 2 detailed evaluation. Disability was confirmed in all Stage 2 assessments, indicating feasibility of the screening process.*

* **Corresponding Author:** Paul Witte, Independent Researcher & Global Physiotherapist, Tribhuvan University, Nepal. Email: powitte@gmail.com

***Conclusion**: Disability screening conducted by trained non-professional assessors using clinical assessment to score the MGS appears to be a promising methodology, and warrants further investigation. If it is found to be valid, it could provide a powerful tool to increase the visibility of disability among some of the most vulnerable populations.*

***Key words**: disability evaluation, International Classification of Functioning, Disability and Health, Community-based Rehabilitation, literacy, minority groups*

INTRODUCTION

The vulnerability of people with disabilities is exacerbated by their invisibility (Swartz et al, 2018). Nepal's landmark Act Relating to Rights of Persons with Disabilities, 2074 (2017) (ARRPD) marked a leap forward nationally in the process of making disability more visible. Critically, this new law provided an updated definition of a person with a disability, and established a disability identity (ID) card programme which serves as the eligibility document for the government's disability-inclusive social protection scheme (Banks et al, 2017, 2019).

Nepal now defines a person with a disability as someone with "long-term physical, mental, intellectual or sensory disability or functional impairments or existing barriers that may hinder his or her full and effective participation in social life on an equal basis with others" (Act Relating to Rights of Persons with Disabilities, 2074 [2017], 2017). This definition approximates to the language of the UN Convention on the Rights of Persons with Disabilities (UN General Assembly, 2007).

With this internationally-recognised definition recently affirmed in a national law, updated disability assessment methods should be developed which are capable of identifying persons with disabilities, internationally-comparable, and suitable for the local cultural context. Here the word 'suitable' means that the approach must produce the best quality data possible in the population being assessed, with the fewest resources of time, finances, and high-skill personnel (Bolton & Tang, 2002).

The International Classification of Functioning, Disability, and Health -ICF (2001) developed by the World Health Organisation, has been endorsed by all UN Member States (World Health Organisation, 2001) as the conceptual framework and common language for disability statistics (World Health Organisation, 2002;

Kostanjsek, 2011). Coherent with the CRPD (Sherlaw & Hudebine, 2015), and therefore with Nepal's definition of disability, the ICF makes an ideal framework to produce data which is meaningful, internationally-comparable, and capable of accurate description of disability (Üstün, Chatterji, Bickenbach, Kostanjsek & Schneider, 2003; Kostanjsek, 2009; Madden & Bundy, 2019; Stucki, Rubinelli & Bickenbach, 2020).

ICF-derived assessment tools have been produced which depend on both self-report as well as clinical assessment. As commonly-used ICF-based disability assessment tools, both the Washington Group Short Set of Disability Questions (Washington Group on Disability Statistics, n.d.) and the WHODAS 2.0 (World Health Organisation, 2010) depend on self-report of participants to complete the tool. Unfortunately, recent research from Nepal has raised concerns about the utility of such measurement tools in low-literacy populations due to high error rates in responses with both numerical and verbal scales (Pathak et al, 2020), even though the tool they studied had been previously validated in the local language and culture (Sharma, Palanchoke & Abbott, 2018).

As an alternative to self-report tools, ICF Core Sets (ICF-CS) are typically scored by clinical assessment (World Health Organisation, 2013). An ICF-CS is a short selection from the full list of 1400 ICF categories, which is considered to be the most essential to describe functioning of a person with a certain health condition or in a certain healthcare context (Bickenbach, Cieza, Rauch & Stucki, 2012). Among the dozens of ICF-CS now available (ICF Research Branch, n.d.), the Minimal Generic Set – MGS - (Cieza et al, 2014; ICF Research Branch, n.d.) has been suggested as an efficient and user-friendly ICF-based disability assessment tool (Bickenbach, Posarac, Cieza & Kostanjsek, 2015). Although the MGS has been adopted as a generic measure of functioning in a population (Ehrmann et al, 2018), the authors of the current study are unaware of any published cases describing application of the MGS as part of a disability screening methodology.

Although ICF-CS typically relies on clinicians for scoring, there are no explicit instructions or prohibitions about who can use or score any ICF-CS (Rauch, Cieza & Stucki, 2008). With this in mind, and to satisfy the methodology criteria of 'suitability', the current authors believe that in a context with few trained clinical professionals available, non-professionals can be effectively trained to reliably collect information and score a relatively simple tool such as the MGS.

A clinical assessment strategy, especially when conducted by trained local, non-

professional assessors, would be applicable among populations with low literacy levels where self-report tools may be unreliable or among linguistic minority groups for whom self-report tools have not yet been translated and validated. These populations represent some of the world's most vulnerable people, where disability is currently the most invisible.

Objective

The study aimed to:

1. Develop a disability screening methodology relying on trained non-professionals to conduct focused clinical assessments sufficient to score the MGS;
2. Field-test this methodology to determine its candidacy for further investigation as a screening tool.

METHOD

Study Setting

Located between China and India in South Asia, Nepal is a small, landlocked country with rugged terrain which ranges from tropical lowlands to the slopes of the Himalayan Mountains. Of the population of 26.5 million people, 82.9% live in rural communities (Nepal Population and Housing Census 2011, 2012), many of which are multicultural and multi-ethnic. Nepal is home to 125 distinct ethnic groups, speaking 123 different mother tongues (Government of Nepal, Central Bureau of Statistics, 2014). Access to high-quality healthcare is a fundamental right as per Nepal's 2015 Constitution but in reality, it remains a privilege of those who have access and means (Trägård & Shrestha, 2010; Sharma et al, 2019). With only 0.7 physiotherapists per 10,000 people, physiotherapy in particular is lacking throughout the country (Nepal Physiotherapy Association, n.d.; World Physiotherapy, 2020).

This study took place in the rural Sankhuwasabha District of Northeast Nepal. Almost 160,000 individuals live within the District's 3,480 km² area and 54% of the population speaks a language other than Nepali as their mother tongue (Government of Nepal, Central Bureau of Statistics, 2014). The literacy rate in Sankhuwasabha District is 69.4% (Nepal Population and Housing Census 2011, 2012), indicating that 30.6% of the assessed individuals between the ages of 15-49

are unable to read even part of a sentence, although rates decline significantly from that average with increasing age, female gender, and rural residence (Ministry of Health & Population, Nepal, 2017).

The District Hospital Sankhuwasabha (DHS) is a 36-bed government-run facility located in the District headquarters of Khandbari. It serves residents of the rural communities of Sankhuwasabha and neighbouring Bhojpur District. Generally, rural Nepal does not have adequate medical personnel to meet the needs of the population (Baral, Prajapati, Karki & Bhandari, 2013). Although official District-level data is not available, there are no licensed or paraprofessional rehabilitation clinicians working in Sankhuwasabha, to the best of this study team's knowledge.

Assessor Recruitment and Training

Leaders of a small, local community development NGO were asked to recommend possible research assistants who:

a) Had completed secondary education up to, but no higher than, class 11 or 12,

b) Were lifelong residents of the District,

c) Fluent in Nepali,

d) With no experience in healthcare or disability, and

e) Not currently employed.

Three candidates were recommended and, after interviews, two were selected and compensated for their time at a rate determined appropriate by leaders of the referring NGO. The acting superintendent of the DHS (author LK) independently evaluated these two candidates and confirmed their selection.

Prior to the initiation of the study, assessors were given training that involved 12 hours of lectures, discussions, and lab-based instruction (introduction to disability, the hospital environment, workflows, the clinical assessment process, the MGS tool and scoring with training with simulated cases), and an additional 18 hours working side by side with the study's principal investigator observing the screening process over the first two weeks of the study. By the end of the training, assessors were able to complete assessments independently and accurately. Subsequently, one author (PW) completed bi-weekly independent assessments of several participants for each assessor for the duration of Stage 1 data collection, scoring results were compared to assistant records, and feedback was provided

in the event of a discrepancy in scoring. There were no discrepancies in the outcome of the screening (positive or negative result), although minor variations in scoring were observed.

Study Design

The study design was a prospective, 2-stage evaluation of disability among individuals admitted to the District Hospital Sankhuwasabha. Stage 1 involved screening to categorise participants as having no, temporary, or long-term disability. Stage 2 involved a detailed assessment of participants with long-term disabilities, in order to confirm disability screening results and determine the domain and severity of disability; this was completed at the participant's home in order to account for the environmental contribution to the disability. This design has been used to produce high-quality data with a minimum of resources (UNICEF & Bhutan National Statistics Bureau, 2012).

In order to assess disability using the MGS, Nepal's definition of disability had to be operationalised in terms of degrees of severity used by the ICF. To correspond to the lowest level of difficulty scored by the ICF's "Mild" or "Minimal" levels of difficulty (see Table 1), a person with a disability was defined as "someone who has physical, mental, intellectual or sensory impairments which, in interaction with various barriers, causes at least a 5% difficulty in some meaningful area of participation in society on an equal basis with others."

Table 1: ICF (2001) vs Nepal Disability ID Card (Act Relating to Rights of Persons with Disabilities, 2074 [2017], 2017) Severity Categories

ICF Category	ICF Category Definition	Nepal ARRPD Category	ID Card Colour	Nepal ARRPD Category Definition, "A person who is in such a condition that he or she":
Mild	5-24% difficulty	Mild	White	Can regularly participate in his or her daily activities and social activities if there exists no physical and environmental barrier.
Moderate	25-49% difficulty	Moderate	Yellow	Can regularly participate in his or her daily activities and in social activities if physical facility is available, environmental barrier is ended or education or training provided.

Severe	50-95% difficulty	Severe	Blue	Needs support of others continuously to perform personal activities and involve in social activities.
Complete	96%+ difficulty	Profound	Red	Has difficulty in performing his or her day-to-day activities even with continuous support of others.

Study Population

Participants were recruited from a convenience sample of individuals admitted to the DHS between August 11, 2019 and March 23, 2020. Six days per week (excluding Saturdays) hospital census records were reviewed by research assistants and all newly-admitted individuals who had not yet been contacted were approached to discuss the study. Informed consent was solicited from potential participants as soon after hospital admission as possible, within 72 hours or less.

All admitted persons with non-maternity-related diagnoses, aged eighteen years and above, were eligible to participate in the study, unless they were discharged or referred to a higher centre of care before assessors could make contact.

Data Collection Procedures: Adaptation and Use of the MGS

The ICF is a complex but flexible instrument, and must be adapted before deployment for any purpose. As Madden, Hartley, Mpofu and Baguwemu (2013) stated, "It is a challenge but also an advantage that the ICF does not provide a formula or strict set of rules for its use. Its use requires thought and selection. But this also means that it provides flexibility – it can be used freely to suit different uses and circumstances – as a tool, not a master".

The ICF Minimal Generic Set (MGS) was intended to broadly describe functioning in adults using the fewest ICF codes. Consisting of only seven categories (three from 'Body Functions' and four from 'Activities & Participation'), it is purposefully brief and direct (Cieza, Oberhauser, Bickenbach, Chatterji & Stucki, 2014). Although the 'Activity & Participation' items on the MGS presume that two qualifiers for each item will be scored—both Performance (what the individual actually does), and Capacity (what the individual would be capable of in a "neutral" or "uniform" environment)—the authors of the current study are of the view that the Capacity qualifier is too nuanced and complex (Bostan, Oberhauser, Stucki, Bickenbach & Cieza, 2014) to be scored by a non-professional, and accordingly Capacity qualifier scoring was excluded from data collection.

Scoring for the single qualifier for the 'Body Functions' items and Performance qualifier for the 'Activities & Participation' items on the MGS was conducted on a 0-4 scale according to the standard instructions in the ICF (2001).

Paper packets were used during Stage 1 screening; these consisted of the informed consent forms, form for basic demographic information, interview questions and functional assessment guide (see Supplementary Material 1), as well as a scoring sheet for the 7 items of the MGS. Assessors took notes during screening and referred to those when scoring the MGS while at the participant's bedside. While still on-site, assessors discussed each positive screening case with the participant's physician or the study's lead author, to determine whether disability should be classified as temporary or long-term according to the above criteria. After screening newly-enrolled participants, assessors transported screening packets to an off-site, locked, private office where they transcribed collected data into a spreadsheet programme with files encrypted after each use. Screening packets were then stored in a locked cabinet in the office, to which only the principal investigator and assessors had access.

Screening with the MGS was considered positive for disability if any one item was scored 2 or above, or at least two items were scored 1. This threshold was set to identify a person with a disability according to the working definition developed for this study.

As screening data was transcribed, custom algorithms copied relevant screening and demographic data of participants with positive screening for long-term disability into a separate file to create a register of participants to be scheduled for Stage 2 evaluation. When team schedules and weather/rural road conditions allowed, and between one and six months after Stage 1 screening, research assistants called participants to agree on a time the following day for the study's Principal Investigator and assistant to complete Stage 2 assessment. Researchers navigated to participants' homes by off-road motorcycle and on foot, depending on road access and conditions.

Data Collection Procedures: Stage 2 Enrollment Process and Assessment

Participants with positive Stage 1 screening were considered to have a temporary disability if all difficulties identified on the screening tool:

1. Developed not more than one month prior to hospital admission; and,

2. Were related to a medical condition which was expected to fully resolve, with no residual effects, not more than one month after discharge from the local hospital. This determination was a clinical judgment made collaboratively by an experienced physiotherapist (author PW) and/or the individual's attending physician during the hospital stay.

All other participants with positive Stage 1 screenings were considered to have a long-term disability, and enrolled in Stage 2.

Between one and six months after hospital discharge, eligible participants were visited at their home, throughout Sankhuwasabha and adjoining Bhojpur District, to complete a detailed Stage 2 assessment based on the ICF checklist (World Health Organisation, 2003) but adapted for the local context. A form of free listing (Bolton & Tang, 2002) was used in community interviews to identify important activities in the local area, with key categories mapped to the corresponding ICF code (see Appendix 1 for a complete list).

A physiotherapist (author PW) completed assessments in the Nepali language, with linguistic support as needed by a local Nepali assistant. These assessments provided data on the 'Activity & Participation' levels of participants through review of relevant medical records, detailed interviews and physical assessment, and analysis of the impact of the barriers and facilitators in their specific physical and social environments. Stage 2 assessments typically lasted 45-60 minutes.

Data Collection Procedures: Stage 2 Assessment Scoring and Disability Categorisation

Though disability is a complex and multidimensional phenomenon (UN General Assembly, 2007; World Health Organisation and World Bank, 2011), and a single score cannot adequately describe an individual's disability experience, assessed individuals were grouped into severity categories for the purpose of concise description and comparison with the rankings described by the National Disability ID card programme (see Table 1). The disability severity categories were based on the ICF coding convention for 'Activity & Participation' (A&P) - Performance, where a score of '0' indicates no difficulty, '1' of mild difficulty, '2' of moderate difficulty, '3' of severe difficulty, and '4' of complete difficulty. The highest score recorded from among all relevant A&P items for an individual was used to determine that individual's level of disability severity. Irrelevant items (i.e., d6506-"Caring for animals'' - for a participant whose family raises no animals) were scored as 'Not Applicable' and disregarded from analysis. This

method of disability severity categorisation presents disability on a continuum of more or less (rather than a dichotomous Yes or No), consistent with the ICF's model (2001).

Data Analysis

Data was de-identified, entered into a spreadsheet, and analysed with descriptive statistics.

Ethical Considerations

Applicable regulations from the Nepal Ministry of Health and District Hospital Sankhuwasabha concerning the ethical use of human volunteers were followed. The Nepal Health Research Council approved the study prior to the initiation of data collection [Ref # 3519, received 9 July 2019]. Study assistants solicited written informed consent in Nepali from all potential participants. Consent forms were read out to those unable to read comfortably, along with discussion to ensure understanding throughout the process. Thumbprints and witness signatures were collected if the participant was unable to pen a sign. No compensation or incentive was given to study participants.

RESULTS

Though it was planned to continue data collection for one full year, due to the COVID-19-related lockdown in Nepal the study was truncated on March 23, 2020, after 32 weeks. Within the data collection period, 210 individuals admitted to the District Hospital Sankhuwasabha were eligible for inclusion (see Figure 1 and Table 2 for details).

Figure 1: Participant Inclusion and Evaluation Flowchart

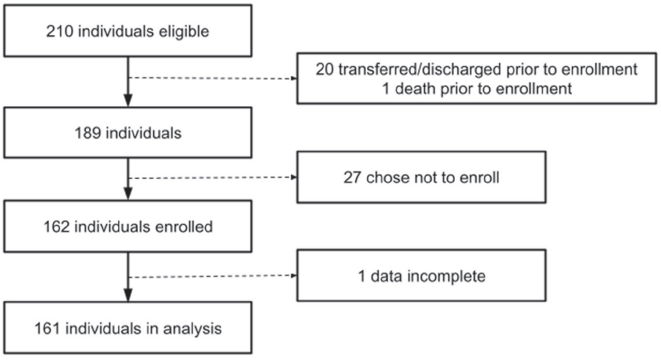

Table 2: Participant Demographics

Participant Age by decade (n=161 total)	
18-29	33
30-39	22
40-49	22
50-59	20
60-69	28
70-79	25
80+	11
Median Age (IQR)	50 years (32 - 68)
Gender Ratio	42.0% male, 58.0% female

Of the 161 participants, 40 (24.8%) were not able to make a distinguishing mark on the consent form and used their inked thumbprints instead, and an additional 33 participants (20.5%) only made an 'X' on the signature line because of inability to write their name or initial. Among the 13 participants assessed in Stage 2, only 1 participant had any amount of formal education (four years).

Stage 1- Screening Process Findings

The screening process typically took 10 minutes to complete, including scoring of the MGS tool after assessors had been fully trained. Bi-weekly quality checks revealed acceptable agreement with assessors on scoring, and particularly with the screening result. However, as the hospitalised population in this study generally had a high level of various impairments and the MGS assesses very high-level skills, there were few opportunities to check for agreement with negative screening results.

Stage 1- Screening Results

Among 161 participants included in the analysis, 159 (98.8%) had a positive screening for disability. While 124 of the total 161 (77.0%) were categorised as having a temporary disability, 35 (21.7%) had a long-term disability. Those with temporary disability were affected by various levels of reversible impairments due to the effects of their acute illness or injury, which is known to be common in hospitalised populations (Hajjioui, Fourtassi & Nejjari, 2015; Loyd et al, 2020).

Stage 2- Detailed Assessment Results

Due to weather-related adverse rural road conditions, data collection for Stage 2 could not begin until study week 12 (November 2019). Stage 2 assessments were completed on only 13 of the 35 (37.1%) scheduled participants (see Table 3) as premature termination of the study prevented assessment of 18 participants. Four additional participants could not be assessed - due to death (2), not being at home at the time of scheduled appointment (1), and inability to locate the participant's home (1).

Table 3: Stage 2 Assessed Participant Demographics

Assessed # Stage 2 participants (M / F)	13 (7 / 6)
Median Age (IQR)	65 years (52.5-77.5)

Eighteen participants were assessed in Stage 2; among them 10 (55.6% or 6.2% of the study population) presented with "complete difficulty" in at least one assessed 'Activity & Participation' item on the ICF. Mobility was the most common domain of disability for participants assessed in Stage 2 (see Tables 4 and 5).

Table 4: Disability Category per Stage 2 Assessment Results

Severity Category	**Adult**
No identified disability	0 (0.0%)
Mild disability	1 (7.7%)
Moderate disability	3 (23.1%)
Severe disability	2 (15.4%)
Complete disability	7 (53.8%)

Table 5: Primary Domain (and Secondary, if applicable) of Disability among Participants Assessed in Stage 2

Disability Category	**Adult**
Mobility	11 (84.6%)
Self-care	4 (30.8%)
Communication	0 (0.0%)
Vision	3 (23.1%)
Hearing	1 (7.7%)
Cognition	0 (0.0%)

*Percentages do not add up to 100% due to some participants having a disability

in multiple domains. Percentages are equal to the prevalence of each disability category in each group of participants.

DISCUSSION

Use of Non-professional Assessors to conduct Clinical Assessments

The study researchers set out to develop a disability assessment methodology which is both capable of producing reliable internationally-comparable data, as well as being suitable to the local context. In the context of this study, the investigators needed to consider the lack of physiotherapists in the region. To ensure this method could be maintained after the study was completed and to reproduce it in other low-resourced communities, the methodology had to be such that a trained professional could efficiently and effectively identify and train someone in the local community. Although there is limited research on the abilities of non-professionals and paraprofessionals to conduct accurate clinical assessments outside of mental health and counselling (Durlak, 1979; Armstrong, 2010), there is a long history of relying on such workers to conduct a wide array of disability-related assessments and interventions related to Community-based rehabilitation (Werner, 1987; ILO, UNESCO, WHO, 2004; IDDC, 2012; Iemmi, Blanchet, Gibson & Kumar, 2016). According to this well-established precedent and the results of this study, the researchers have no reservations about relying on trained non-professionals to effectively complete this important work, and indeed can see no superior alternative.

Feasibility in Low-literacy and Linguistic Minority Groups

Another important contextual consideration was the low-literacy rates and linguistic minority groups that are prevalent in this region and similar regions around the world. In this study, although the literacy level was not formally assessed, some information about writing competency was gained on the basis of the high number of participants who were unable to sign the consent form. Given the difficulty of individuals with low literacy in providing reliable responses to self-report questionnaires involving more than 3 response items (Flaskerud, 2012; Chaves, Reis, Pagano & Torres, 2017; Pathak et al, 2020), tools relying on clinical assessment for disability assessment may be more suitable. However, areas with lower literacy also tend to have a paucity of available clinical professionals to administer such assessments (Wilson et al, 2009). Using local, non-professional

trained assessors (who are multilingual when necessary) to administer a clinical assessment to score the MGS eliminates the barriers related to self-report response errors and the need to translate and validate a questionnaire into every spoken language. Based on the good agreement in Stage 1 screening results during quality checks by the lead author, as well as confirmation of disability in all assessed participants in Stage 2, this study demonstrated the feasibility of this potentially powerful approach.

The MGS as a Disability Screening Tool: Experience with Adaptation, Limitations, Future Needs

The MGS, released in 2014, is being used as a generic measure of functioning in hospitals throughout China (Ehrmann et al, 2018). During adaptation, 'remunerative employment' (d850) was removed from scoring because clinicians were "unable to appraise this category in the inpatient setting". The authors of the current study are of the view that all MGS codes should be scored when used as a screening tool for disability according to a CRPD-based definition of disability, even if this results in a high rate of positive screenings in some settings. What is needed is some filtering and management of the resultant data, not elimination of relevant categories.

Although the CRPD considers disability only to be as a result of long-term impairments, the ICF makes no such distinction. The MGS, like any of the common ICF-based self-report screening tools (World Health Organisation, 2010; Module on Child Functioning: Questionnaires, 2016; Washington Group on Disability Statistics, n.d.), is not capable of discriminating between those individuals with temporary and chronic impairments and participation restrictions. As a screening tool, this is an acceptable and unavoidable weakness. However, if the MGS or any screening tool is being used as part of an effort to support and enable people with impairments, limitations and disabilities, it is incomplete to identify problems and not activate a successor process to identify appropriate next steps. In this study, there was reliance on assessors' consultation with a physiotherapist or the participant's physician in order to determine whether the difficulties identified during screening were temporary and resolvable, or part of a long-term condition. In most typical community-based rehabilitation (CBR) type applications, such resources would not be readily available. In order for screening with the MGS or any other tool to be efficacious as part of a community empowerment effort, appropriate successor processes should be designed according to goals

and locally-available resources to ensure the health and social service needs of participants are attended to appropriately (Cieza et al, 2020; Mont & Cote, 2020).

Overall the researchers were very pleased with the MGS and the quality of information, as Stage 2 assessments confirmed disability of varying degrees in all assessed participants. This indicates effective assessment and scoring by trained non-professional assessors and appropriate positive/negative screening thresholds. It is recommended that the MGS be further studied as a disability screening tool to ensure validity. If found to be valid, this tool may be of special use to Community-based Rehabilitation workers and others who provide essential care and support services to individuals with low literacy levels or speakers of minority languages in resource-limited settings. In light of the potential utility of the MGS for functional assessment and possibly disability screening, the current researchers recommend training in use of this tool to be part of any standardised CBR curriculum which may be developed (Gindorfer & Cornielje, 2020).

Limitations

Due to a high positive screening rate in this hospitalised population, it was difficult to provide blinded independent assessments of a sample of participants to determine inter-rater reliability. However, during selected independent Stage 1 assessments, there were no discrepancies between positive and negative screens performed by the physiotherapist and the study assessors.

Stage 2 assessments were only completed on those with positive screening for long-term disability, and all assessed participants did demonstrate disability of varying degrees. Although this shows the screening process correctly identified people with long-term disabilities, it does not reveal how often participants were misclassified by the study criteria as having no or temporary disabilities. Furthermore, the sample size of those assessed in Stage 2 was limited due to early termination of the study, potentially limiting the validity of these Stage 2 results.

This study showed feasibility, but did not investigate the validity of this screening approach.

CONCLUSION

Nepal's 2017 Disability Rights provided the impetus for the development of updated methods to make disability visible. Approaches based on clinical assessments have advantages over self-report tools for disability assessment,

especially among populations with low literacy levels or minority language use. This study has demonstrated the feasibility of training non-professional assessors using clinical assessment of participants to score the MGS. If future investigations further establish the validity of this method, it may provide a powerful tool for use, particularly in CBR settings, to increase the visibility of persons living with disability.

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Supplementary Material 1: Stage 1 Clinical Assessment Screening Procedure

Interview Guide (rephrasing or asking clarifying questions is acceptable)

- When did you arrive here at the hospital?
- What problem were you having when you came?
- Are you still having that problem?
- Are you having any pain, either right now, or over the last day?
- Where do you live, and with whom?
- What sorts of things did you do before you got sick with the problem that brought you to the hospital? What was your daily routine like?
- Before you got sick with the problem that brought you to the hospital, was anything in your daily life or routine difficult for you? Were you able to do everything people your age are typically able to do?

Functional Assessment

Instruct the individual to do the following, and note if they are able to do it, how well, how quickly, and how comfortably. Note anything that seems to be worse than normal for someone their age.

- Lift arms up over your head

- Bend up and down at elbows
- Open and close both hands quickly 5 times
- Look up/down/left/right
- Seated marching
- Seated kicks
- Seated ankle pumps
- Stand and march in place
- Repeated stand up and sit down
- Walk back and forth across the room
- Pick something up off the floor

*Based on this information, complete the GDS screening form according to the instructions

Supplementary Material 2: Data Collection Items for Stage 2 Assessment

Basic Demographics
Age
Gender
Currently a student?
Total years of education
Marital status
Occupation
Medical diagnosis - 1
Medical diagnosis - 2
Home location
Body Functions
b110 - Consciousness functions
b114 - Orientation functions
b117 - Intellectual functions
b130 - Energy and drive functions
b134 - Sleep functions
b140 - Attention functions
b144 - Memory functions
b152 - Emotional functions
b156 - Perceptual functions
b164 - Higher level cognitive functions
b167 - Mental functions of language
b210 - Seeing functions
b230 - Hearing functions
b280 - Sensations of pain
b310 - Voice functions
b410 - Heart functions
b430 - Hematological system functions
b435 - Immunological system functions
b440 - Respiration functions
b515 - Digestive functions

b525 - Defecation functions
b530 - Weight maintenance functions
b555 - Endocrine gland functions
b620 - Urination functions
b710 - Mobility of joint functions
b730 - Muscle power functions
b765 - Involuntary movement functions
b770 - Gait pattern functions
Body Structures (both extent of impairment and nature of change assessed)
s110 - Structure of brain
s120 - Spinal cord and related structures
Chapter 2 - Eye, ear, and related structures
Chapter 3 - Structures involved in voice and speech
s410 - Cardiovascular system and related structures
s430 - Respiratory system and related structures
Chapter 5 - Digestive, metabolic, and endocrine structures
s710 - Structure of head and neck region
s720 - Structure of shoulder region
s730 - Structure of upper extremity
s740 - Structure of pelvic region
s750 - Structure of lower extremity
s760 - Structure of the trunk
Chapter 8 - Structure of skin
Activity & Participation (both performance and capacity assessed)
d110 - Watching
d115 - Listening
d130 - Copying
d131 - Learning through actions with objects
d132 - Acquiring information

d133 - Acquiring language
d135 - Rehearsing
d140 - Learning to read
d145 - Learning to write
d150 - Learning to calculate
d155 - Acquiring skills
d160 - Focusing attention
d166 - Reading
d170 - Writing
d172 - Calculating
d175 - Solving problems
d210 - Undertaking a single task
d220 - Undertaking multiple tasks
d310 - Communicating with/receiving spoken messages
d315 - Communicating with/receiving nonverbal messages
d330 - Speaking
d335 - Producing nonverbal messages
d340 - Producing messages in formal sign language
d350 - Conversation
d410 - Changing basic body position
d415 - Maintaining a body position
d420 - Transferring self
d430 - Lifting and carrying objects
d440 - Fine hand use
d450 - Walking
d470 - Using transportation
d510 - Washing oneself
d520 - Caring for body parts
d530 - Toileting
d540 - Dressing
d550 - Eating
d560 - Drinking
d570 - Looking after one's own health
d620 - Shopping

d630 - Cooking
d640 - Doing housework
d6506 - Caring for animals
d660 - Assisting others
d710 - Greetings and "small talk"
d750 - Informal social relationships
d760 - Family relationships
d810 - Informal education
d815 - Preschool education
d820 - School education
d825 - Vocational training
d850 - Remunerative employment
d859 - Agricultural work
d860 - Basic economic transactions
d870 - Economic self-sufficiency
d880 - Engagement in play
d910 - Ceremony participation
d920 - Recreation and leisure
d930 - Religion and spirituality
d950 - Political life
Environmental Factors
Products and technology for:
e110 - Personal consumption
e115 - Completion of activities of daily living (ADLs)
e120 - Personal indoor/outdoor mobility and transport
e1551 - Design, construction and building products and technology for gaining access to facilities in buildings for private use
e1552 - Design, construction and building products and technology for way finding, path routing and designation of locations in buildings for private use, indoor and outdoor products
Natural environment and human-made changes to environment:

e210 - Physical geography
e225 - Climate
e298 - Local paths and roads
Support and relationships:
e310 - Immediate family
e315 - Extended family
e320 - Friends
e330 - People in positions of authority
e355 - Health professionals
Attitudes of:
e410 - Immediate family members
e415 - Extended family members
e425 - Acquaintances, peers, and neighbours
e430 – People in positions of authority
e460 – Societal attitudes
Services, systems, and policies:
e540 - Transportation
e560 - Medial
e570 - Social security
e580 - Health systems
e585 - Education and training systems