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Functional Health Status of Adults with Locomotor Disabilities: A Descriptive Survey in West Bengal

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Abstract: ***This study assessed the functional health status of adults with locomotor disabilities using a descriptive survey approach. Conducted in two organizations within the North 24 Parganas district of West Bengal, the study included 90 individuals aged 18–60 years with ≥40% certified disability, selected via non-probability consecutive sampling. Functional health was measured using the standardized Health Assessment Questionnaire Disability Index. Results revealed that 67% of the participants had better functional health scores (0–1), with significant limitations observed in mobility-related activities. Most respondents required assistance, particularly for hygiene, reach, and grip functions. While self-care and upper-limb functions were relatively preserved, lower-limb strength and postural stability posed greater challenges. The findings emphasize the need for individualized care planning, early rehabilitative interventions, and policy-level strategies to support independent living among persons with locomotor disabilities.***

Keywords: locomotor disability, functional health, disability index, rehabilitation, assistive devices

1. Introduction

Functional health is a significant indicator of general health as well as quality of life of an individual. The level of functional health needed can vary from person to person, depending on their life aspirations and capabilities. According to Census 2011, there are 20,17,406 Person with Disabilities who constitute 2.21% of total population of West Bengal and in district North 24 Parganas total PwDs are 219853 among them 28751 are locomotor (movement) disabled which constitute 13% of total PwDs of the concerned district (1). Functional health refers to the ability to move body parts, walk, grasp, and perform essential daily tasks with outcomes measured by improvements in functional limitations and overall well-being. Health is a positive concept emphasizing social and personal resources, as well as physical capacities." According to the World Health Organization, mental health is "a state of wellbeing in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community" (2). However, for a lot of individuals it is not often disability itself, which can have the most negative impact on an individual. intensive rehabilitative measures should be implemented urgently to make them self-reliant (3). The study was undertaken for a comprehensive understanding of disability-related challenges faced by locomotor disabled people by assessing functional health status. This study provides essential baseline data on functional limitations among individuals with locomotor disabilities in West Bengal, highlighting critical areas for intervention, resource allocation, and rehabilitation planning.

Objectives:
The objective of the study was to assess functional health status among persons with locomotor disabilities.

2. Methodology

Research design: A quantitative research approach and a descriptive survey design were adopted to assess the functional health status of persons with locomotor disabilities.

Study variables: Functional health status is the rating score of individual's self-reported functional difficulty level which is measured by Health Assessment Questionnaire Disability Index (HAQ-DI). Higher the scores denote the lower the functional health status.

Study location: According to the Census of India, 2011 North 24 Paragana is one of the district with higher PWD population among West Bengal. The study was conducted in two selected organizations of North 24 Paraganas district of West Bengal. Study was conducted on June - August, 2024 in OPD of selected organizations.

Sample and Sample Size: Study sample was adult person aged between 18 to 60 years having the benchmark criteria of disability (40% disability), the same was checked by the investigator through medical record analysis during the period of data collection. Person with locomotor disabilities with other disabilities, pregnant woman and having high support needs were excluded from the study. As the study was conducted on a pilot basis to test the feasibility of the main study, 30% of the calculated sample size was considered, resulting in a total of 90 participants.

Sampling technique: The Non-Probability Consecutive Sampling method was applied to choose the sample. The client attending OPD was recruited until the desired sample size was achieved. Informed consent from each respondent was obtained after explaining the purpose and method of study.

Study tools and technique: Baseline data were obtained by using a predesigned, pretested schedule translated in the local language. Functional health status was measured by the standardized tool named Health Assessment Questionnaire (HAQ) consists of eight groups' i.e. 1) dressing, 2) rising up, 3) eating, 4) walking, 5) hygiene, 6) reach, 7) grip, and 8) activities.(4) For each of these groups, patients inform the depth of difficulty they had in executing two or three particulars' activities. There were either 2 or 3 questions for each section. The responses were scored using using a 4-point Likert scale. A global score was calculated by summing the scores for each of the question and then dividing the summed score by the number of questions. More score is indicative of more disability, hence poor functional health status. Some items of the HAQ-DI questionnaire were culturally adapted based on validators' suggestions, and reliability was retested ($\alpha = 0.82$).

HAQ items also included an aids/devices variable (0–3), pain was assessed using VAS (0–3), and overall health status on a 0–100 scale.

Ethical aspects: Ethics committee clearance was taken from the ethical committee of NILD, Kolkata and Faculty Research Committee of Manipur International Institute, Manipur before the study. Interview of the study subjects was done after taking informed consent.

3. Result

Table 1: Distribution of the respondents across type of disability, n= 90

Variables	Total	
	F	%
Type of locomotor disability		
Neurodevelopmental problem	27	30
SCI / Paraplegia	**29**	**32.2**
CVA/ Hemiplegia/ Hemiparesis	7	7.7
Amputation	10	11.1
Others	17	18.9
Percentage of disability		
Moderate (41%-75%)	**59**	**65.56**
Severe (75%-90%)	30	33.33
Profound (91%- 100%)	1	1.11

As presented in Table 1, spinal cord injury/paraplegia was the most frequently reported condition, accounting for 29 respondents (32.2%), while the remaining participants were distributed across other types of locomotor disabilities in lower proportions. Regarding disability severity, 59 respondents (65.56%) were classified as having a moderate level of disability, followed by 30 respondents (33.33%) with severe disability and 1 respondents (1.11%) with profound disability. These findings indicate that moderate disability constituted the dominant category within the study population, with nearly two-thirds of the respondents falling into this range. This distribution highlights that moderate functional limitation constituted the dominant pattern within the study population.

Table 2: Distribution of respondents according to functional health status, **n**=90

Health status (Disability index)	Total	
	F	%
Better functional health (0-1)	**60**	**67**
Moderate functional health (1-2)	23	25
Least functional health (2-3)	7	8

* Lower the score, better the functional health
Minimum score-0
Maximum score-3

As presented in Table 3, the majority of respondents, 60 out of 90 (67%), were categorized as having better functional health (Disability Index score: 0–1). A smaller proportion, 23 respondents (25%), demonstrated moderate functional health (score: 1–2), while only 7 respondents (8%) fell into the least functional health category (score: 2–3). These findings suggest that approximately two-thirds of the study population exhibited comparatively better functional health, whereas only about one-third experienced moderate to poor functional health. Notably, the distribution reflects a skew toward lower disability index scores, indicating that better functional health predominated within the sample.

Table 3: Distribution of respondents according to functional health score of dressing and personal care, rising up, eating, walking, n=90

Domain		Total	
		F	%
Dressing & personal care	Without any difficulty (0)	**67**	**74.4**
	With some difficulty (1)	15	16.7
	With much difficulty (2)	0	0
	Unable to do (3)	8	8.9
Rising up	Without any difficulty (0)	32	35.6
	With some difficulty (1)	**37**	**41.1**
	With much difficulty (2)	16	17.7
	Unable to do (3)	5	5.5
Eating	Without any difficulty (0)	**66**	**73.3**
	With some difficulty (1)	17	18.8
	With much difficulty (2)	7	7.7
	Unable to do (3)	0	0
Walking	Without any difficulty (0)	**33**	**36.7**
	With some difficulty (1)	27	30
	With much difficulty (2)	16	17.8
	Unable to do (3)	14	15.6

As shown in Table 3, most respondents reported no difficulty with self-care activities such as dressing and personal hygiene. In contrast, functional limitations were more evident in mobility-related tasks, with 37 respondents (41.1%) experiencing difficulty in rising from a chair without arm support and in getting in and out of bed. Fine motor and upper-limb activities were largely preserved, as the majority (66, 73.3%) reported no difficulty in eating independently, lifting a cup or glass, or opening a new carton or box. Similarly, 33 respondents (36.7%) indicated no difficulty in walking on flat ground or climbing five steps. Taken together, these findings suggest that while self-care and upper-limb functions remain relatively intact, tasks involving lower-limb strength and postural control pose

greater challenges for individuals with locomotor disabilities.

Table 4: Distribution of respondents according to functional health score of hygiene, reach, grip, activities, n=90

Domain		Total	
		f	%
Hygiene	Without any difficulty (0)	**53**	**58.9**
	With some difficulty (1)	28	31.1
	With much difficulty (2)	5	5.5
	Unable to do (3)	4	4.4
Reach	Without any difficulty (0)	29	32.2
	With some difficulty (1)	**33**	**36.7**
	With much difficulty (2)	6	6.7
	Unable to do (3)	22	24.4
Grip	Without any difficulty (0)	**48**	**53.3**
	With some difficulty (1)	29	32.2
	With much difficulty (2)	9	10
	Unable to do (3)	4	4.4
Activities	Without any difficulty (0)	**43**	**47.8**
	With some difficulty (1)	36	40
	With much difficulty (2)	8	8.8
	Unable to do (3)	3	3.3

As presented in Table 4, the majority of respondents (53, 58.9%) reported no difficulty with personal hygiene tasks, including washing and drying the body, bathing while sitting on a 'patta' or the floor, and sitting on or rising from the toilet. In the domain of reach, 33 respondents (36.7%) experienced some difficulty in lifting or retrieving objects, such as a 2 kg bag from above the head, bending to pick up items from the floor, or picking up a newspaper. For grip-related activities, most respondents (48, 53.3%) reported no difficulty in opening door latches or bottles and in turning taps on and off. In the domain of daily activities, 43 respondents (47.8%) were able to perform tasks such as shopping, getting in and out of a car or auto rickshaw, and household chores like sweeping or gardening. These findings indicate that while hygiene and grip functions were relatively preserved, limitations were more evident in reaching and mobility-dependent activities.

Table 5: Distribution of respondents according to type of assistance needed, n=90

Category	Type of assistance	Total	
		F	%
Dressing and personal care, rising up, eating, walking.	No assistance needed	20	22.2
	Special device used	34	37.8
	Help from another person	**42**	**46.7**
	Needs both (special device and help from another person)	6	6.6
Hygiene, reach, grip, activities.	No assistance needed	12	13.3
	Special device used	34	37.8
	Help from another person	**61**	**67.8**
	Needs both (special device and help from another person)	17	18.9

*Data showed in this table is not mutually exclusive

Table 5 reveals varying assistance needs across domains, with most participants requiring help in personal care and hygiene. In the domain of dressing, personal care, rising, eating, and walking, 46.7% relied on help from another person, while 37.8% used a special device. For hygiene, reach, grip, and other activities, 67.8% needed assistance from another person, with additional respondents using devices or both support methods, highlighting the need for targeted nursing interventions and rehabilitative support to enhance functional independence.

Table 6: Distribution of pain status of persons with locomotor disabilities, n=90

Pain status	Total	
	f	(%)
Mild to moderate (0-1)	46	51.1
Moderate to severe pain (1-2)	16	17.7
Severe to very severe pain (2-3)	28	31.1

Minimum score-0
Maximum score-3

As shown in Table 6, 51.1% of respondents reported mild to moderate pain, while 31.1% experienced severe to very severe pain. In the rural subgroup, 20% reported moderate to severe pain, compared to 17.7% overall, indicating that pain is a significant concern across the study population and warrants targeted assessment and management.

Table 7: Mean and Standard Deviation of overall health status of persons with locomotor disabilities, n=90

	Mean	SD
Overall health status	59.11	18.39

Minimum score-0 Maximum score-100

As presented in Table 7, the mean health status score among respondents was 59.11, with a standard deviation of 18.39, indicating moderate variability in overall health within the study population. These findings provide a baseline measure of functional health,

4. Discussion

Prevalence of Locomotor Disabilities

Krishnan (2021) (5) and Suganthi et al. (6) indicated that spinal cord injuries (SCI) like paraplegia and quadriplegia were the most common forms of locomotor disability. Similarly, Major Findings: The fact that spinal cord injuries (SCI) are the most common type (32.2%) in the major findings is in line with the patterns observed across the studies, such as Jain et al. (7), which identified higher rates of SCI in their sample.

Severity of Disabilities:

The studies suggest that a significant portion of individuals with locomotor disabilities experience moderate disabilities. Mishra K et al. (2019) (5) highlighted high levels of

functional limitations in individuals with disabilities. In present study the finding that 65.56% of respondents had moderate disabilities (40%-75%) aligns with these studies, emphasizing the functional limitations that many individuals face.

Discussion with other studies related to health status in terms of functional ability among persons with locomotor disability

The rehabilitation studies, demonstrate that functional independence post-injury or illness is achievable, particularly when guided by structured rehabilitation programs and psychosocial factors. Some studies emphasized the importance of discharge FIM scores in predicting successful community reintegration (8), while others found that 24% of patients with severe post-stroke hemiplegia achieved independence following rehabilitation (9). Some further underscored the role of self-control and emotional regulation in accelerating recovery, showing significant improvements in physical abilities over an eight-week rehabilitation period (10).

In contrast, the present study paints a less optimistic picture. Among individuals with lifelong or permanent disabilities such as SCI and congenital disorders, 67% had the better level of functional health, with substantial percentages unable to perform basic activities such as dressing (74.4%), eating (73.3%), rising (41.1%) and walking independently (36.7%). Unlike the stroke and rehabilitation studies where recovery is actively pursued and often partially attained, the participants in the disability study appear to face enduring limitations with minimal evidence of improvement or rehabilitative intervention. This may be attributed to the inherently permanent nature of such disabilities —often congenital or irreversible—as well as the systemic lack of tailored rehabilitation resources or adaptive technologies.

Several studies further illustrate the potential for physical function improvement through targeted interventions. They have identified muscle strength and range of motion (ROM) as key factors in locomotion disability among older adults, suggesting that exercise programs can mitigate mobility issues (11). Additionally, these studies demonstrated how advanced technologies (e.g., myoelectric prostheses) and early, intensive rehabilitation can lead to notable functional gains even in patients with complex amputations (12). These findings stand in sharp contrast with the high levels of dependency found in the present study, where 67.8% of respondents needed assistance with daily living tasks, and functional outcomes were not linked to any rehabilitative factors.

Overall, while the stroke and mobility-focused studies suggest a degree of plasticity and improvement with appropriate intervention, the present study highlights the persistent nature of functional impairments in certain populations. This contrast underscores the critical need for early, targeted, and continuous rehabilitation strategies—even for those with long-term disabilities—to potentially improve quality of life and independence.

The quantitative well-being gap observed between individulas with congenital disabilities and SCI/CVA is similarly reflected in some study findings on young adults with cerebral palsy. It was noted that pain, fatigue, and depression began early in life and that emotional support significantly improved health status and life satisfaction (13). These factors may contribute to why those with congenital conditions, despite physical limitations, reported higher subjective wellbeing, possibly due to longer periods of psychosocial adaptation. The present study also found that mean self-reported health status was 59.11 and 51.1% respondents reported experiencing mild to moderate pain.

From a broader musculoskeletal perspective, Péntek et al. (4) demonstrated that physical (14) limitations, such as those measured by HAQ-DI, were moderately correlated with lower wellbeing using ICECAP-A and -O tools. This aligns with the findings of present study that indicates disability type—particularly those with greater functional impairments like SCI and CVA—significantly influences wellbeing ($p = 0.002$).

Lastly, Canha et al. (2016) found that adolescents with disabilities who perceived their health positively also reported greater life satisfaction (15), a theme consistent with current study's outcome where self-perceived wellbeing varied significantly across disability types, highlighting the role of subjective experiences and health perception in shaping overall wellbeing.

5. Conclusion

This study highlights the variability in functional health status among adults with locomotor disabilities and underscores the high dependence on others for daily activities. Findings call for individualized, multidisciplinary rehabilitation approaches and stronger community-level and policy responses to promote autonomy and quality of life in this population.

6. Recommendation

The study highlights the need for continuous assessment of functional abilities, individualized care planning, and health education to promote self-care of persons with locomotor disabilities. Nurses and community health workers play a pivotal role in multidisciplinary rehabilitation, caregiver training, psychosocial support, and regular follow-up. Clinically, early interventions—including physiotherapy, occupational therapy, and use of assistive devices—are essential to prevent decline and sustain functional independence. From a community perspective, supportive environments, accessibility measures, and awareness programs are critical to reduce barriers. Policy-level strategies should prioritize capacity-building of community health workers and integration of rehabilitation services into primary health care. Further, longitudinal study to evaluate the effectiveness of targeted interventions may be planned for same group in different setting.

Strength: A validated and standardized tool was employed for data collection, ensuring reliability and accuracy. The study offers a comprehensive understanding of disability-

related challenges by assessing not only functional health but also activities of daily living. Findings provide actionable insights for multidisciplinary rehabilitation, community-level interventions, and policy formulation to improve quality of life for individuals with locomotor disabilities.

Limitation: Study findings rely on self-reported functional abilities and wellbeing, which are subject to response bias and may not fully capture objective health conditions.

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Conflicts of interest: There is no conflict of interest.

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