



Investigation of wheelchair skills performance, confidence and frequency using wheelchair skill test questionnaire among wheelchair bounded individuals residing in community: An observational study

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Abstract:

Background: - Wheelchair has become an important part of people with disability. Most of the people with locomotor disability depend on manual wheelchair for community mobility and participate in daily living activities. However manual wheelchair users need wheelchair skills performance, confidence and frequency for better performance in the community mobility and daily living activities. For this reason, valid and reliable instrument to assess wheelchair skills performance, confidence and frequency is necessary.

Purpose: - To analyze the wheelchair skills performance, confidence and frequency among wheelchair bounded individuals.

Methodology: - This study was carried out among 37 community dwelling wheelchair bounded individuals. Wheelchair skills performance, confidence and frequency were assessed by using Wheelchair Skill Test Questionnaire (version 5.3)

Result: - The descriptive results however revealed that the basic level wheelchair skills such as rolling forward, backward, turning, folding and unfolding wheelchair have good performance, confidence, and frequency scores than community level skills.

Conclusion: - The study indicates less scores for wheelchair skills performance, confidence and frequency in skills (performs ground transfer, ascend and descend incline, ascend and descend steep incline) and good performance, confidence and frequency scores in skills (rolling forward, backward, turning, folding and unfolding wheelchair)

Keywords: Wheelchair bound, performance, confidence, frequency, locomotor disability.

1. INTRODUCTION:

15% of the world's population, or more than one billion individuals, have a disability. As the population ages and those with chronic illnesses live longer, the numbers of persons with disabilities will rise¹. According to the International Classification of Functioning, Disability, and Health model, a disability is multifactorial and incorporates impairments, activity limitations, and participation restrictions².

Mobility and movement around rural and urban environments, as well as attempting to negotiate and frequently overcoming environmental and sociocultural barriers that make it challenging for them to fully participate in society and have an impact on their quality of life, all play a significant role in the lives of disabled people³. One percent of the world's population, or 15% of the total, requires wheelchairs for better mobility⁴. Access to assistive technology, such as wheelchairs, has been identified as a facilitator to the full enjoyment of human rights for many people with disabilities⁵.



In a manual wheelchair, the capacity to move around reflects an important component of independence and quality of life. A thorough evaluation with accurate measures that elicit the client's viewpoints can also lead to improved technology use and, as a result, lower abandonment rates of assistive technology⁶. In order to examine wheelchair skills and training programs for use in the rehabilitation of clients with limited mobility, valid and reliable wheelchair skill assessment tools are required⁷.

For use with users or caretakers, the Wheelchair Skill Test Questionnaire comprises separate versions for powered and manual wheelchairs. To test the knowledge of particular wheelchair skills, these forms include both simple and sophisticated wheelchair maneuvers, such as rolling forward or climbing an incline. Access to wheelchairs is an essential part of rehabilitation and a deciding factor in successful involvement in society and employment, according to numerous studies⁸.

Properly prescribed wheelchairs allow people with impaired mobility to gain an increased ability to perform ADLs, participate in communities, and reduce secondary medical complications such as upper limb repetitive strain injuries, pain, and/or pressure sores⁹. However, having a wheelchair does not automatically mean that it serves the individual needs. Both training and awareness about wheelchair skills are important aspects for wheelchair users to increase their societal participation¹⁰.

International organizations are encouraging improved accessibility to suitable technology to satisfy this need and enhance the quality of life for people in wheelchairs and other impairments. Assistive technology is crucial for people to be independent, participate in all facets of life, and exercise their rights, according to the United Nations Convention on the Rights of Persons with Disabilities¹¹.

The goal of the International Society of Wheelchair Professionals is to professionalize the wheelchair industry through the standardization of wheelchair services, the coordination of wheelchair events, and the promotion of the importance of quality wheelchair services globally¹². Although there are numerous international initiatives underway, it has been noted that it is difficult to provide high-quality products due to a lack of controls (regulations), adoption of product and service provision standards, funding, and trained personnel. Other challenges include limited funding, limited expertise, limited awareness of and training for instructors, and limited physical resources¹¹. There is less literature available on the topic of assessment of wheelchair skills performance, confidence, and frequency among bounded wheelchair individuals.

Hence this study aimed to analyze the wheelchair skills performance, confidence, and frequency among wheelchair bounded individuals.

2. MATERIALS and METHOD:

The study commenced after obtaining approval from the institutional ethical committee. A total 37 male and female wheelchair bounded individuals aged 18-75 yrs, residing in community and who were able to propel their wheelchair independently were included through a simple random sampling technique. Participants were excluded if they had any unstable medical condition. Informed consent of participants was obtained after ensuring that they met the eligibility criteria. Then demographic and clinical characteristics of individuals were assessed (age, gender, diagnosis). After that level of awareness of wheelchair skills performance, confidence and frequency were assessed using Wheelchair Skill Test Questionnaire (version 5.3). It has 3 domains that are performance, confidence and frequency. Scoring for each domain is given from 0 to 3.

Statistical Analysis: Data were statistically described in terms of mean \pm SD. Statistical analysis was done using descriptive statistics.

3. RESULT:

Table No. 1 shows the mean age of 37 participants and was found to be 50 ± 18.9 years. From 37 participants 22 were males and 15 were females having most of the male participants. We have included the wheelchair bounded individuals with different diagnosis with most of the participants were of SCI and PPRP. Table No. 2 shows mean \pm SD of wheelchair skills performance, confidence and frequency for various indoor and community level wheelchair skills. The participants have shown good performance, confidence and frequency scores among indoor level skills than community level skills.

4. DISCUSSION:

This study is the first to our knowledge to investigate the wheelchair skills performance, confidence, and frequency among wheelchair bounded individuals residing in the community using validated wheelchair skill test questionnaire version 5.3. The wheelchair skill test questionnaire quantifies the performance, confidence, and frequency of wheelchair skills.



However, we have included only 17 wheelchair skills since the rural population performs these wheelchair skills in their activities of daily living which meets their needs.

However, our study revealed that performance scores were lowest in the skills such as ascending and descending steep inclines as well as ground transfers. As well as moderately reduced performance scores were found in the skills such as maneuvering sideways, and getting through hinged doors.

The reason for less score in these skills is due to a lack of opportunities to try these skills. The highest performance scores were found in the skills (rolls forward, backward, and turning in place). The reason behind this may be more of using these skills in performing activities of daily living which is similar to the study conducted by Hosseini et al¹³.

The study also showed reduced confidence scores in the skills (ascends and descend steep and slight incline, rolls on a soft surface). This may be due to reduced performance and hence are not as confident to perform these skills.

While good confidence scores were found in the skills (rolls forward, backward, and turning in place). The present study also revealed lower frequency scores in the skills such as shifting of weight, reaching for objects, ascending and descending steep inclines, and ground transfer. Less scores in these skills are due to infrequent need or some users perform these skills rarely or never or less often than once a year. While the study also showed good frequency scores such as rolling forward and backward, turning in place as well as turning while moving forward and backward showing that they are more aware of these skills.

The descriptive results however revealed that the basic level wheelchair skills such as rolling forward, backward, turning, folding and unfolding wheelchair have good performance, confidence, and frequency scores than community and advanced skills which is similar to the study conducted by Saddam Hossain¹⁴.

The lower performance, confidence, and frequency scores for items such as performing ground transfers, and ascending and descending steep inclines were seen in our study which is similar to the study conducted by W. Ben Mortenson et. al.¹⁵. This suggests the need for training in these skills. The main limitation of our study was the small sample size. Future studies need to address this limitation. Also need to add wheelchair skill training programme as a component along with assessment.

5. CONCLUSION: -

The results of the current study indicate less WST-Q performance scores in skills (ascending and descending steep inclines and ground transfers) and highest performance scores in skills (rolls forward, backward, and turning in place) while less WST-Q confidence scores were found in the skills (ascends and descend steep and slight incline, rolls on a soft surface) and good confidence scores in the skills (rolls forward, backward, and turning in place). Similarly, less WST-Q frequency scores in the skills such as shifting of weight, reaching for objects, ascending and descending steep inclines, and ground transfer and good frequency scores in the skills (rolling forward and backward, turning in place as well as turning while moving forward and backward)

FUNDING: - Nil

CONFLICTS OF INTEREST: - None

Table no. 1: - Baseline characteristics of individuals

Age (mean ± SD)		50 ± 18.9	
Gender (n)	Male	22	
	Female	15	
Diagnosis (n)	SCI	Cervical	2
		Thoracic	5
		Lumbar	4
	Amputation	BKA	1
		Chopart's	1
	PPRP		11
	Hemiparesis		4
	Congenital deformity	b/l LL	3
		Lt. LL	1
Pott's spine		1	



	Rt. femur fracture	1
	OA knee	2
	Kyphoscoliosis	1

Table no: - 2 Scores for performance, confidence and frequency of wheelchair skill test questionnaire

Sr. No.	Wheelchair skills	Level	Mean ± SD		
			Performance	Confidence	Frequency
1.	Rolls forward	Indoor	2.62±0.49	2.64 ± 0.48	2.64 ± 0.48
2.	Rolls backward	Indoor	2.56 ± 0.5	2.59 ± 0.59	2.70 ± 0.46
3.	Turns in place	Indoor	2.54 ± 0.5	2.45 ± 0.6	2.10 ± 0.3
4.	Turns while moving forward	Indoor	2.4 ± 0.49	2.43 ± 0.5	2.05 ± 2.22
5.	Turns while moving backward	Indoor	2.45 ± 0.5	2.48 ± 0.5	2.05 ± 0.22
6.	Maneuvers sideways	Indoor	1.70 ± 0.57	1.86 ± 0.53	1.16 ± 0.55
7.	Reaches objects	Indoor	2.11 ± 1.03	2 ± 1.15	1.37 ± 0.99
8.	Shifts weight	Indoor	2.62 ± 0.49	2.43 ± 0.64	1.91 ± 0.43
9.	Performs level transfers	Indoor	2.27 ± 0.43	2.13 ± 0.94	2.21 ± 0.41
10.	Folds and unfolds wheelchair	Community	1.94 ± 0.81	2 ± 0.88	2.08 ± 1.06
11.	Performs ground transfers	Community	0.16 ± 0.68	0.16 ± 0.68	0.10 ± 0.51
12.	Gets through hinged door	Indoor	1.40 ± 0.68	1.32 ± 0.88	1.32 ± 0.81
13.	Ascends slight incline	Community	1.29 ± 0.84	1.29± 0.84	1 ± 0.66
14.	Descends slight incline	Community	1.29 ± 0.86	1.29 ± 0.84	1 ± 0.66
15.	Ascends steep incline	Community	0.32 ± 0.52	0.32 ± 0.52	0.37 ± 0.54
16.	Descends steep incline	Community	0.32 ± 0.52	0.32 ± 0.52	0.37 ± 0.54
17.	Rolls on soft surface	Community	1.35 ± 0.67	1.24 ± 0.72	0.86 ± 0.53

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