Development of a Questionnaire for Assessing the Facilitators and Barriers Perceived by Stroke Patients Receiving Physiotherapy Treatment

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Abstract

Background: *Physiotherapy benefits stroke patients by reducing pain, preventing complications, and enhancing quality of life. Adherence is crucial for successful treatment, yet many struggles. Addressing nonadherence causes is vital. Adherent patients have better outcomes, but poor adherence is common in physiotherapy. This study aims to develop and validate a questionnaire to analyse the challenges and facilitators that should be considered when giving physiotherapy treatment.*

Objective: *To develop and validate the questionnaire for identifying facilitators and barriers among the stroke patients receiving physiotherapy treatment, between the relatives, medical management and stroke rehabilitation team and those that promote and inhibit stroke patients from receiving physiotherapy treatment.*

Methods: *The questionnaire was developed in three phases: literature search, content validation and psychometric testing. The questionnaire items were derived from a thorough literature review suggesting all the facilitators and barriers perceived by stroke patients receiving physiotherapy. Face to face validation was done for the items of the questionnaire. The final version of the questionnaire contained two main and twelve sub domains. A total of 41 patients receiving physiotherapy or any other treatment were recruited from the tertiary care hospital and outpatient rehabilitation centre in Chhatrapati Sambhaji Nagar. Psychometric testing of the scale included content validation and reliability and validity testing.*

Results: *The questionnaire, on reliability and validity test signifies good consistency-(Cronbach's Alpha= 0.74. The KMO measure of sampling adequacy is 0.712 and Barlett's test of Sphericity with approximate chi-square value is 96.085. These results are statistically significant at 5% level (p-value < 0.001). Hence all the statements are distributed normally. With reference to "initial Eigen values it is realized that 2 factors meet the cut-off criterion-Component 1 accounts for 38.586% the highest variability among components. The 2 components indicate cumulative % of 59.838% which is satisfactory for the overall variance explained which is assumed to be a standard.*

Conclusions: *This study revealed key factors of adherence and nonadherence to the exercises among the stroke survivors receiving Physiotherapy treatment. The questionnaire has the possible potential to identify the contextual factors affecting the patients with stroke to access to the physiotherapy treatment.*

Keyword: *Stroke, facilitators, barriers, questionnaire, physiotherapy.*

Introduction

Stroke, a widespread brain disorder with sudden neurological symptoms like paralysis or loss of sensation, arises from brain tissue damage, haemorrhage, emboli, or cerebral artery issues

[1]. It's the second leading global cause of death, projected to rise due to aging populations [2,3]. Without interventions, it's estimated stroke deaths could reach 7.8 million by 2030 [4], with developing nations bearing the highest mortality rates [2].Physiotherapy benefits patients by reducing pain, preventing complications, and enhancing quality of life [5]. Rehabilitation programs also improve functional status beyond natural recovery [6]. Factors like patient involvement, facility quality, staff expertise, and medication availability influence stroke treatment outcomes, but their specific impact on physiotherapy for stroke patients remains unclear [7].In India's low-resource settings, government-run stroke units and rehab facilities are scarce, and private options are inaccessible to rural areas [8,9]. This study aims to guide hospital management in overcoming these challenges, improving physiotherapy adherence, and enhancing stroke patient outcomes efficiently [8,9]. It assesses barriers and facilitators to physiotherapy services for stroke patients. Adherence to treatment is crucial for successful interventions [10], yet many stroke survivors struggle with exercise adherence [11,12]. Identifying and addressing reasons for non-adherence is essential to improve exercise adherence in this population. Post-stroke/TIA patients have increased risks of recurrent stroke or death [13-17], with over 12% experiencing another stroke within a year. Managing modifiable risk factors and lifestyle changes can reduce these risks, but many patients struggle with risk control [18-20]. Promoting exercise aids in lowering recurrent stroke risk [21] and is commonly recommended during stroke rehabilitation, potentially enhancing functional ability [22,23]. However, stroke-related impairments can limit exercise participation [24]. Treatment adherence significantly impacts treatment outcomes [25], with adherent patients often experiencing better results [26,27]. Poor adherence is prevalent across healthcare disciplines, including physiotherapy [28,29,30], but specific rates of non-adherence in physiotherapy remain unclear. Adherence refers to aligning with healthcare recommendations [31], with various factors influencing patient adherence in physiotherapy [32].Identifying adherence barriers aids clinicians in supporting at-risk stroke patients, whose improvement may occur within one year, but many experiences increased disability after 3-5 years. [33]. A therapeutic relationship, focusing on patient needs, is crucial for physical therapists [34]. This study highlights the importance of therapists and administrators assessing and implementing necessary changes.Using Western outcome measures in non-Western contexts presents challenges [35,36,37], mainly due to the lack of relevance to the target population [40]. Studies show that commonly used participation measures in stroke rehab are ineffective for non-Western patients like those in India [36,38,39].Contextual differences in customs, lifestyle, and architecture are key reasons for this disconnect [40]. Various studies suggest that the patients with stroke experience facilitators and barriers under the two main domains i.e.-

A. Health system facilitators and barriers which consists of subdivisions- 1. Physiotherapist's attitude towards stroke patients, 2. Time constraints, 3. Physiotherapy modalities, 4. Distance to the Physiotherapy centre, 5. Materials/Equipment;

B. Personal and Individual facilitators and barriers with the subdivisions as- 1. Socio- cultural facilitator or barrier, 2. Economic facilitator or barrier, 3. Motivational barrier or facilitator, 4. Collaborations with other healthcare professionals, 5. Lack of understanding and Awareness, 6. Barriers to choosing Physiotherapy. Stroke survivors encounter various unaddressed barriers during treatment due to a lack of effective outcome measures, affecting the assessment of patient-physiotherapist relationships. Insights from caregivers and healthcare providers emphasize the importance of considering culturally specific factors that lead to non-adherence in rehabilitation. A new questionnaire will help pinpoint these obstacles, improving treatment delivery in neuro physiotherapy for stroke patients. This study aims to identify recovery barriers and extend therapy during the acute phase to enhance physiotherapy results.

Methodology

Questionnaire Development

Item generation- To enhance content validity and ensure relevance, we developed the items for the questionnaire following a thorough literature review. Based on the literature study results, a conceptual framework of the questionnaire was developed. Two major domains (Health-system and Personal/ individual) of facilitators and barriers were identified as relevant and important. The quantitative survey identified outcomes that are relevant to patients with stroke within Indian context. We selected the items based on the following criteria-

(a.) Primarily effect indicators of adherence or non-adherence to physiotherapy;

(b.) indicators leading to the speedy or delayed recovery. The questionnaire consists of two domains which are subdivided into 5 and 6 sub domains respectively. The questionnaire prepared was then sent to the faculties of MGM Neuro-physiotherapy department, Chhatrapati Sambhajinagar, Maharashtra and asked for content validation in face to face media. The suggestions by the faculties were considered and changes were made accordingly.

The final version of the questionnaire was then sent for Copyrights and has been achieved from the Copyrights Office, Government of India. Registration Number- L- 146591/2024.

Psychometric evaluation of the questionnaire-

The psychometric evaluation for the questionnaire (final version) included- 1- Content validation, 2- reliability and validity test and 3- one sample statistics and one sample test.

Study Setting and Participation

Convenient sampling method was opted for the participation recruitment. The patients who has been taking physiotherapy from the tertiary care hospitals and outpatient neurorehabilitation departments post stroke were recruited. All the patients diagnosed with stroke, both genders were included for the study. Exclusion criteria were (1.) patients with transient ischemic attack; (2.) severe disability caused by a previous neurologic disorder, and (3.) concomitant severe systemic illness. Data were collected from October 2023 to February 2024. Prior to the enrolment, the study method was thoroughly explained to the participants and the informed consent was obtained.

Ethics statement-

The study protocol was reviewed and approved by the institutional review board of MGM Institute of Physiotherapy, Chh. Sambhajinagar. IEC approval no. - MGM/IOP/IEC/UG/2023/219

Scale Administration

The questionnaire was developed on the google docs software and the link of the same was obtained. The questionnaire was in English and could be self-reported but to avoid the proxy responses, all interviews were carried out face-to-face, directly with patients or their relative or care-giver in the bedside or in the outpatient physiotherapy departments depending upon the phase of their rehabilitation. The questionnaire was administered over the sample size of 41. Minimum time required per patient to administer the questionnaire was 10-15 minutes.

Sample Size Calculation

The sample size calculation was done by the formula- Lwanga SK, Lameshaw S.
Sample size determination in health studies WHO, Geneva, 1991

Analyses

Reliability and validity-

To assess the respondents' reliability and validity, Item-Total Correlation and Cronbach's Alpha values were calculated. To improve consistency, a scale item elimination method was used, and after the fourth iteration, five assertions were removed, which improved overall reliability.

Content validation using Exploratory factor analysis (EFA)-

KMO Test is a measure of suitability of data for Factor Analysis. The test measures sampling adequacy for each variable in the model and for the complete model. Bartlett’s test for

homogeneity of variances is used to test that variances are equal for all samples. It checks that the assumption of equal variances is true before running certain statistical tests.

Results

Reliability and Validity

In order to assess the reliability and validity of the respondents; Item-Total Correlation and Cronbach's Alpha values were analysed and it was observed that total Cronbach's Alpha was scored at 0.764 that is statistically good. Further, scale item elimination procedure was carried out to achieve greater level of consistency. After 4th iteration the results revealed that removal of five statements improve overall reliability.

Using item-total correlation, the validity study was conducted, and all statements showed medium to high correlation, with each statement recording a correlation value above 0.30, a validation standard.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.712
Bartlett's Test of Sphericity	Approx. Chi-Square	96.085
	df	28
	p-value	0.001

Content Validation using Exploratory Factor Analysis [EFA]-

The KMO measure of sampling adequacy is 0.712 and Barlett's test of Sphericity with approximate chi-square value is 96.085. These results are statistically significant at 5% level (p-value < 0.001). Hence all the statements are distributed normally.

Overall Cronbach's Alpha 0.764				
Particular	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q1	23.12	18.76	0.490	0.734
Q3	23.63	19.44	0.390	0.751
Q10	23.54	20.35	0.359	0.755
Q17	23.27	17.30	0.520	0.728
Q18	23.10	18.34	0.459	0.740
Q19	24.15	18.43	0.398	0.753
Q21	23.59	17.55	0.663	0.705
Q24	23.59	18.80	0.447	0.742

Total Variance Explained

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.087	38.586	38.586	2.399	29.990	29.990
2	1.700	21.252	59.838	2.388	29.848	59.838
3	.993	12.412	72.249			
4	.629	7.863	80.112			
5	.548	6.847	86.959			
6	.437	5.468	92.427			
7	.318	3.969	96.396			
8	.288	3.604	100.000			

Referencing the "initial Eigen values," two components meet the cut-off criteria. The table reveals two components with Eigen values exceeding one. The "% of variance" reflects the overall variability explained, with Component 1 accounting for 38.586%. Together, the two components explain a cumulative 59.838% of the variance, considered standard.

One-Sample Statistics-

Questions	Mean	SD
Q1	3.73	0.92
Q3	3.22	0.94
Q10	3.32	0.79
Q17	3.59	1.14
Q18	3.76	1.04
Q19	2.71	1.12
Q21	3.27	0.92
Q24	3.27	0.98

The SD is close to one, indicating that the respondent's opinions are consistent, and the mean value is greater than three, which is on the positive side of the scale and falls inside the upper and lower confidence intervals, as determined by the descriptive statistics. The lower and upper values of the 95% confidence interval (CI) indicate that the outcome will be the same as shown in the table above for the entire research population. The agreement of 95% of the respondents in the study population is likely to have the same opinion as the full respondents in the sample on all specified claims.

Discussion

The study identified health system barriers like communication, therapist contact, transportation, and session duration, while health system facilitators include schedule convenience and therapist communication. Personal/ individual barriers include perception by others, lack of awareness, and effectiveness concerns, while personal/ individual facilitators encompass motivation, therapist involvement, and economic factors, influencing stroke patients' access to physiotherapy.

Communication (51.2% good) and comfortable goal discussions with therapists (78%) enhance patient recovery (46.3% moderately). Barriers include transportation (55%) and session timing (45% neutral). Personal factors involve public perception (35%), motivation, therapist collaboration, and economic issues. These align with Damsuh et al.'s [42] study, highlighting the importance of social support and stroke-specific exercise programs for survivors.

Peter O. Ibikunle et al. (2020) found that Nigerian physiotherapists face barriers in implementing evidence-based practice in stroke management, including time constraints, limited information resources, organizational mandates, research skill gaps, and difficulty in critically appraising literature [43].

Around one-third of stroke patients faced social perception issues, impacting physiotherapy adherence due to negative societal attitudes. Payne et al. [44] emphasized the need to consider cultural perspectives in stroke care. Interestingly, 30% reported no socio-cultural barriers, possibly linked to higher education improving their perceptions and beliefs about treatment.

Patients reported that financial factors moderately affected their access to physiotherapy, with transportation costs (32.5%) as the primary barrier, followed by financial dependence from not working (27.5%).

Patients faced several financial barriers in accessing physiotherapy services, including costs for transportation, medication, service fees, and caregiver charges, which hindered access. Some suggested including physiotherapy in Mediclaim, while others felt the treatment costs did not match the duration of the therapy. A study by Mercy Nketia-Kyere et al. (2017) [45] indicated that economic hurdles were the main personal barrier to accessing these services. Additionally, patients opted for alternative treatments for relief, highlighting a reliance on physiotherapy.

Traditional obstacles to exercise adherence included medication reliance, awareness gaps, long recovery, and societal attitudes. However, increased stroke recovery awareness, self-efficacy, family support, and ongoing healthcare facilitated adherence. Financial stability and education, along with job demands, restricted access to physiotherapy and alternative remedies.

Physiotherapists' attitudes weren't a barrier to accessing physiotherapy; they were seen as friendly and supportive, encouraging patients to use services [46]. Patients received assistance during therapy sessions, reflecting skilled staff [47]. Contrastingly, some studies highlighted issues of disrespect by healthcare staff [48]. Adherence interventions should focus on improving self-efficacy, disease knowledge, treatment emphasis, and patient involvement. Individualized treatment, family involvement, and societal support can strengthen exercise behavior.

Our study found that patients were comfortable discussing goals (78%) and satisfied with physiotherapy session timing (72.5%), though they were neutral about the overall timing. Patients and relatives believed that physiotherapy moderately impacted stroke recovery (46.3%) Jaume Morer-Balaguer et al., 2018, [49]. This study highlighted that therapeutic patient-centered relationships in outpatient rehabilitation depend not only on professional qualities but also on patient attitudes and contextual factors like organization and team coordination.

Conclusion

This study revealed key factors of adherence and nonadherence to the exercises among the stroke survivors receiving Physiotherapy treatment. To assess the barriers and facilitators found individual barriers and facilitators divided into two main domains a.) Health system and b.) individual/ personal; depending on the extent of perseverance by the patients receiving Physiotherapy treatment. The questionnaire has the possible potential to identify the contextual factors affecting the patients with stroke to access to the physiotherapy treatment.

Limitations

There are few limitations of this study. The sample size was small. There was certain language barrier faced while administering the questionnaire among the stroke patients. The study does not precisely specify the communication gap faced between the patient and the therapist. The study did not separately classify the facilitators and barriers individually under a particular domain.

Future Scope

This study can be done over large sample size. Future work should consider examining questionnaire items' ability to change over time (responsiveness) and establishing minimal clinically important different outcomes. Evaluation of the exercise adherence on the basis of patient point of view and their relative can be done. Communication barrier or facilitator can be added in the next study. Future work might also consider additional assessments of reliability and relationships to similar and diverging constructs of interest. The barriers and facilitators portrayed by the patients and their relatives suggests to work in that direction and consider while proving the treatment.

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