ORIGINAL RESEARCH

Barriers and Facilitators of Using Standardized Outcome Measures in Stroke Rehabilitation in Saudi Arabia: A Cross-Sectional Study of Practice Among Neurophysiotherapists

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Background: Clinical guidelines emphasize the use of standardized outcome measures (SOMs) in post-stroke rehabilitation. However, the extent of SOM utilization among physiotherapists in this context in Saudi Arabia remains unclear.

Aim: 1) assess the current use of SOMs by physiotherapists involved in stroke rehabilitation in Saudi Arabia and 2) identify facilitators and barriers influencing the use of SOMs.

Methods: An online survey was administered using a three-section questionnaire designed for this study. The first section collected demographic data, the second evaluated the use of SOMs recommended by the American Physical Therapy Association, and the third explored factors facilitating or hindering SOM use in clinical practice. Only highly recommended outcome measures capturing the three levels of the International Classification of Functioning, and Disability (ICF) model were considered: body structure and function, activities, and participation. Poisson regression analysis was used to investigate the association between SOMs utilization and educational level, work experience, type of work facility, and the number of patients treated per week.

Results: A total of 138 physiotherapists responded. Most participants (98.5%) used at least one outcome measure in clinical practice. Regression analysis showed that number of strokes treated per week and facility type were associated with the likelihood of using higher number of SOMs. Physiotherapists managing more than 10 stroke patients per week and working in private sector had significantly higher odds of using a greater number of SOMs. The most pronounced barriers were time restrictions and limited resources.

Conclusion: Physiotherapists working with stroke patients in Saudi Arabia demonstrate a high awareness and positive attitude toward SOM utilization. Addressing barriers such as time management and resource allocation is crucial to enhancing SOM integration in clinical practice.

Clinical Rehabilitation Impact: Organizational support in terms of adequate time and resources is needed to enhance the use of SOMs among physiotherapists.

Keywords: outcome measure, outcome assessment, neurorehabilitation, rehabilitation, neurophysiotherapy

Introduction

Stroke is a global healthcare problem and has been described as the second-leading cause of death (11.6% of total deaths) and the third-leading cause of death and disability combined in 2019.[1] In Saudi Arabia, there are 32 adult stroke cases per every 100,000 persons annually.[2] Individuals with stroke can suffer several impairments, including motor, sensory, and cognitive impairments, as well as reduced ability to perform self-care and participate in social and community activities.[3] Therefore, stroke patients require intensive rehabilitation to improve their activity level and participation.

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Evidence-based practice (EBP) in stroke rehabilitation emphasizes the integration of standardized outcome measures (SOMs) to assess treatment effectiveness across various domains such as physical function and psychological well-being.[4] SOMs enable therapists to systematically evaluate patient progress, tailor interventions, and improve clinical decision-making based on objective data. Clinical guidelines have focused on the use of standardized outcome measures (SOMs) in rehabilitation after stroke.[5] The Canadian Stroke Best Practice Recommendations (CSBPR) provide guidance for the assessment and management of stroke and recommend that "Assessments of impairment, functional activity limitations, role participation restrictions, and environmental factors should be conducted using standardized, valid assessment tools.[6]

In addition, a systematic review of 38 papers to establish a published international evidence base regarding intervention design and evaluation delivered by occupational therapists highlighted that intervention and evaluation designs should include careful selection of outcome measures.[7]

In post-stroke rehabilitation, SOMs are assessment tools used to measure changes in patient function, performance, and participation over time.[8] The routine use of SOMs demonstrates a better quality of care and supports clinical decision-making.[9] With the advent of the International Classification of Functioning and Disability (ICF) by the World Health Organization (WHO), clinical practitioners have been encouraged to assess each individual comprehensively, including body function/structure, activities, participation, and environmental and personal factors.[10]

For stroke patients, the use of SOMs can enhance patient care, as it is attributed to a more comprehensive examination, aids in the development of a care plan, and assists physical therapists in setting up realistic treatment goals by comparing patient status between examination periods.[5] Additionally, the selection of an appropriate outcome measure increases the efficiency of clinical practice by improving communication between the clinicians involved in stroke management.[11]

Although the known value of using SOMs abounds, multiple studies have reported that the routine use of SOMs in daily practice has been neglected.[12–14] Barriers to regular SOMs use include time constraints; inadequate equipment; therapists' perception that patients may have difficulty in understanding the outcome measures; therapist's attitude, knowledge, or skill; and lack of training.[8,15–19] A recent study in Ghana assessed the use of SOMs for stroke rehabilitation among physiotherapists and found that 52.4% (n = 55) of physiotherapists did not use outcome measures in their clinical practice.[12] In Saudi Arabia, one study reported that 62% (n = 180) of physiotherapists use SOMs in general in their clinical practice.[8] However, this study was performed among physiotherapists with different specialties (orthopedics, neurology, pediatrics, cardiovascular, etc). Only ten neurological physiotherapists participated in this study. Furthermore, the majority of participants worked in Riyadh City, which could affect the generalizability of the results. Therefore, there is limited literature on the use of SOMs by physiotherapists for stroke rehabilitation in Saudi Arabia. The primary aim of this study was to explore the use of SOMs by physical therapists in stroke rehabilitation in Saudi Arabia. The secondary aim was to investigate the facilitators and barriers influencing the use of SOMs in individuals with stroke in routine clinical practice.

Methods
Study Design
This cross-sectional observational study used an online survey to explore the use of SOMs by physiotherapists in Saudi Arabia. This study was approved by the Ethics Committee of Prince Sattam bin Abdulaziz University (ethical approval number: RHPT/021/013). After completing the survey, participants provided informed consent for data analysis and publication. The Strengthening Reporting of Observational Studies in Epidemiology statement was used to ensure rigor of reporting.[20]

Participants and Recruitment
There are over 7,000 qualified physical therapists in Saudi Arabia. The role of physiotherapists in stroke care includes the assessment of patients, diagnosis, treatment (interventions, advice, and evaluation of outcome), and referring patients to other specialists/services if needed.[21]

Certified physiotherapists managing adult stroke patients in both the government and private sectors were included in the study. Physiotherapists working in countries other than Saudi Arabia, student interns, and physiotherapists who did not manage stroke patients were excluded from the study. To recruit potential participants, an anonymous online survey invitation was sent to randomly selected certified physiotherapists by the Saudi Commission for Health Specialties (SCFHS) to participate in the study. The survey began with the question "Did you treat stroke survivors in your daily practice?" to include only physiotherapists working with stroke patients. If they answer "No", the survey will be closed and the participants will not be included in the study.

Outcome Measure

A questionnaire with 27 items was designed to achieve the aim of this study. Google Forms was used to create the online survey. The survey questions were designed based on a pre-existing questionnaire and SOMs recommended by the American Physical Therapy Association (APTA) neurology section task force.[8,15–19] The questionnaire consisted of three sections. The first section was designed to collect demographic information about the participants, such as age, sex, level of education, years of work experience, work city in Saudi Arabia, type of facility, and the number of stroke patients managed per week. The second section assessed the use of a list of standardized outcome measures recommended by the APTA. The responses were as follows: does not know the scale, does not use the scale, uses the scale in the acute stage, uses the scale in the chronic stage, and uses the scale in all stroke stages. SOMs were selected according to the latest recommendations from the APTA neurology section task force.[5] Only the highly recommended outcome measures, namely, 20 scales, were considered. The scales measure different aspects of activity and body function according to the ICF. The last section of the questionnaire aimed to explore the factors that could facilitate or hinder the use of standardized outcome measures in clinical practice. It lists 15 sentences measured using a Likert scale ranging from "strongly agree" to "strongly disagree". Appendix 1 provides a copy of the questionnaire.

The questionnaire was pre-tested for face and content validity by five expert neurophysiotherapists with characteristics similar to those of the participants in the study. Feedback from the pre-test was used to modify the wording and structure of the questionnaire before its implementation in the main study.

Data Analysis

Data from the online survey were exported as an Excel file for analysis using the Statistical Package for the Social Sciences (SPSS) (IBM Corp, Armonk, NY, USA, version 26). Data were descriptively analyzed and reported using absolute and relative frequencies.

Poisson regression was used to explore the association between the number of scales used by therapists (dependent variable) and the four independent variables of participant characteristics (educational level, work experience, type of work facility, and number of patients managed per week). In addition, the association between the number of scales not known by the therapist (dependent variable) and the same four independent variables. Categorical variables (eg, education, work experience, work facility, number of patients managed per week) were recorded as dichotomous (eg, education level (Diploma and Bachelor's = 0, Master's and Doctorate = 1), work experience (1 to 10 years = 0, more than 10 years = 1), type of work facility (government = 0, private = 1), and number of stroke patients managed per week (1–10 patients = 0, more than 10 patients = 1). Beta estimates, confidence interval of B, standard error, and p-values are presented for each independent variable. Missing data were not possible in the current study because all the questions were mandatory to complete the survey.

The sample size calculation was based on the number of variables using the following formula: $n > 50 + 8 \, m$, where m is the number of independent contributing factors, and n is the number of participants needed.[22,23] According to this formula, the required estimated sample size was 82 (with four independent variables per analysis).

Data Availability

The data associated with the paper are not publicly available but are available from the corresponding author upon reasonable request.

Results

Participant's Characteristics

A total of 742 certified physiotherapists were invited to participate and 497 volunteered (recruitment rate: 67%). Only 138 physiotherapists who met the inclusion criteria completed the study. A flowchart of study enrolment is presented in Appendix 2. The age of the respondents ranged from 23 to 70 years. The sample comprised of approximately 57% male and 43% female participants. In terms of educational level, 3% of the participants had a diploma, 76% had a Bachelor's degree, 18% had a Master's degree, and 3% held a Doctoral degree, as shown in Table 1. Most participants had 1–5 years' experience (45%). Only 5% had more than 20 years of clinical experience. The participants mainly worked in Riyadh (37%) or Mecca (24%). Over half of the participants (54%) worked in the private sector.

Usage of SOMs

The results of using SOM showed that most participants (n = 136, 98.5%) used at least one outcome measure in their clinical practice. Of these, 66 participants (47.8%) used ≥ 10 outcome measures in their daily practice. The participants'

Table 1 Participant's Characteristics

Variable	Frequency (n= 138)	Percentage (%)
Age		
20–29	53	38.41
30–39	55	39.86
40–49	23	16.67
50–59	5	3.62
≥60	2	1.44
Gender		
Male	79	57.25
Female	59	42.75
Professional degree		
Diploma	4	2.90
Bachelor's	105	76.09
Master's	25	18.12
Doctorate	4	2.90
Years of experience		
1–5 years	62	44.93
6–10 years	25	18.12
11–15 years	13	9.42
16–20 years	31	22.46
>20 years	7	5.07
Region		
Riyadh	51	36.96
Mecca	33	23.91
Eastern province	16	11.59
Jizan	8	5.80
Asir	7	5.07
Al-Jawf	6	4.35
Medina	6	4.35
Al-Qassim	4	2.90
Hail	4	2.90
Al-Bahah	1	0.72
Najran	1	0.72
Tabuk	1	0.72

(*Continued*)

Table 1 (Continued).

Variable	Frequency (n= 138)	Percentage (%)
Type of work facility		
Government	63	45.65
Private	75	54.35
Number of stroke patients managed per week		
1–10 patients	113	81.88
11–20 patients	13	9.42
21–30 patients	4	2.90
31–40 patients	4	2.90
41–50 patients	1	0.72
>50 patients	3	2.17

use of the standardized outcome measures indicated that the least-known scale was the Wolf Motor Function Test (WMFT) (40%) and the least-used scale was the Fugl–Meyer Assessment of Motor Performance–Upper Extremity Subscale (FMA-UE) (37%) (see Table 2). The scales they most used in the acute stage were the Ashworth Scale (AS) and Five Times Sit-to-Stand Test (5XSST) (22% each), as shown in Table 2. Their most-used scale in the chronic stage was the Six-Minute Walk Test (6MWT) (31%). The most-used scales across all stroke stages were AS, Berg Balance Scale (BBS), and Functional Independence Measure (FIM) (43%).

Respondents were asked to list the names of other standardized outcome measures used in clinical practice that were not included in the questionnaire. They reported a list of the outcome measures (see Appendix 3).

Table 2 Percentage of Participants Using Each Standardized Outcome Measure

Scales	Does not know the scale (%)	Does not use the scale (%)	Uses the scale in the acute stage (%)	Uses the scale in the chronic stage (%)	Uses the scale in all stroke stages (%)
Five Times Sit-to-Stand Test	5.1	21.0	22.5	17.4	34.0
Six-Minute-Walk Test	1.4	29.7	16.7	31.2	21.0
9-Hole Peg Test	34.8	34.8	10.1	8.0	12.3
10-Meter Walk Test	10.9	36.2	10.9	21.0	21.0
Ashworth Scale	8.0	14.5	21.7	12.3	43.5
Berg Balance Scale	3.6	18.8	18.8	15.9	42.8
Box & Blocks Test	34.8	34.8	10.9	8.7	10.9
Dynamic Gait Index	17.4	35.5	13.8	13.8	19.6
Fugl–Meyer Assessment of Motor Performance–Upper Extremity Subscale	23.2	31.2	17.4	8.7	19.6
Fugl–Meyer Assessment of Motor Performance–Lower Extremity Subscale	23.9	37.0	13.8	5.8	19.6
Functional Independence Measure	5.8	15.9	19.6	15.2	43.5

(*Continued*)

Table 2 (Continued).

Scales	Does not know the scale (%)	Does not use the scale (%)	Uses the scale in the acute stage (%)	Uses the scale in the chronic stage (%)	Uses the scale in all stroke stages (%)
Functional Reach Test	10.1	22.5	18.1	12.3	37.0
Motor Activity Log	23.2	31.9	18.8	5.8	20.3
Postural Assessment Scale	13.0	26.1	19.6	10.1	31.2
Stroke Rehabilitation Assessment of Movement–Mobility Subscale	26.1	29.0	15.9	8.7	20.3
Stroke Rehabilitation Assessment of Movement–Limb Subscale	31.2	29.0	13.0	4.3	22.5
Tardieu Scale	34.1	31.9	8.7	8.0	17.4
Timed "Up & Go" Test	8.7	28.3	11.6	18.8	32.6
Trunk Impairment Scale	23.9	31.2	17.4	7.2	20.3
Wolf Motor Function Test	39.9	31.2	7.2	8.0	13.8

The coefficients from the Poisson regression analysis predicting the use of SOM are presented in Table 3. For the number of scales utilized by physiotherapists, the odds of using SOM were significantly higher among those working in the private sector compared to those in government facilities (OR: 1.35; 95% CI: 1.21–1.50, $p < 0.001$). Additionally, physiotherapists who managed more than 10 stroke patients per week had significantly higher odds of using a greater number of SOMs compared to those managing 1–10 stroke patients per week (OR: 1.21; 95% CI: 1.07–1.38, $p = 0.003$).

Table 3 Poisson Regression Analyses of Using SOM and Participant's Characteristics

Dependent variable and predictors	B	SE	Exp(B)	95% CI for Exp(B)	P
Number of scales used in acute and/or chronic stages by participant					
Education	−0.06	0.06	0.93	0.82 to 1.07	0.343
Work experience	−0.03	0.05	0.96	0.86 to 1.08	0.359
Type of work facility	0.30	0.05	1.35	1.21 to 1.50	<0.001*
Number of stroke patient managed per week	0.19	0.06	1.21	1.07 to 1.38	0.003*
Number of unknown scales by participant					
Education	0.27	0.10	1.32	1.07 to 1.62	0.008*
Work experience	−0.48	0.11	0.61	0.49 to 0.76	<0.001*
Type of work facility	−0.71	0.09	0.48	0.40 to 0.58	<0.001*
Number of stroke patient managed per week	−0.41	0.14	0.65	0.49 to 0.87	0.003*

Note:* Predictors significantly influenced the dependent variable ($p < 0.05$).
Abbreviation: B = standardized coefficient Beta, Exp(B) the exponentiation of the Beta coefficient (odds ratio), CI = confidence interval.

However, the level of education and work experience were not associated with the number of SOM used by physiotherapists.

Regarding the number of scales unknown to physiotherapists, the odds of not knowing a scale were significantly higher among those with master's and doctorate degrees compared to those with diplomas and bachelor's degrees (OR: 1.32; 95% CI: 1.07–1.62, $p = 0.008$). Furthermore, physiotherapists with 1 to 10 years of experience had significantly higher odds of not knowing a scale compared to those with more than 10 years of experience (OR: 0.61; 95% CI: 0.49–0.76, $p < 0.001$). The odds of not knowing a scale were significantly higher among physiotherapists working in government facilities compared to those in private facilities (OR: 0.48; 95% CI: 0.40–0.58, $p < 0.001$). Lastly, physiotherapists managing 1–10 stroke patients per week had significantly higher odds of not knowing a scale compared to those managing more than 10 stroke patients per week (OR: 0.65; 95% CI: 0.49–0.87, $p = 0.003$).

Facilitators and Barriers to Use the SOMs

Participants generally reported a positive attitude toward the use of SOMs (79%) and found it helpful in clinical decision making (82.7%), as shown in Table 4. In addition, 74% of participants knew the SOMs recommended by the clinical practice guidelines. Furthermore, most participants reported having sufficient knowledge (73.9%) and training (71.1%) on the use SOMs.

Approximately 57.3% of participants reported that their fellow physiotherapists were cooperative in applying the SOMs. Only half of the participants (50.8%) reported a cooperation from their supervisors in applying the SOMs.The use of SOMs was shown to improve communication between patients and therapists by 78.3% of participants. On the other hand, 55.8% of participants reported that the use of SOMs is a waste of patients' time.

The most common barriers to using SOMs were limited resources (ie, availability of equipment) (53.6%), excessive time consumption (50%), and putting physiotherapists at risk of disciplinary actions (32.6%).

Table 4 Factors Influencing the Use of Standardized Outcome Measures for Stroke Rehabilitation

Factors	Strongly agree N (%)	Agree N (%)	Neutral N (%)	Disagree N (%)	Strongly disagree N (%)
1. I know the standardized outcome measures recommended by the clinical practice guidelines (such as APTA) for individuals with stroke	47 (34.1)	55 (39.9)	21 (15.2)	10 (7.2)	5 (3.6)
2. I have sufficient knowledge of how to use the standardized outcome measures	42 (30.4)	60 (43.5)	18 (13)	13 (9.4)	5 (3.6)
3. I have a positive attitude toward the use of standardized outcome measures	50 (36.2)	59 (42.8)	22 (15.9)	4 (2.9)	3 (2.2)
4. The use of standardized outcome measures is too time consuming	25 (18.1)	44 (31.9)	31 (22.5)	27 (19.6)	11 (8.0)
5. The use of standardized outcome measures is a waste of patient time	14 (10.1)	27 (19.6)	20 (14.5)	37 (26.8)	40 (29.0)
6. I am trained to use outcome measures correctly	43 (31.2)	55 (39.9)	22 (15.9)	14 (10.1)	4 (2.9)
7. I have experience with outcome measures	44 (31.9)	59 (42.8)	20 (14.5)	5 (3.6)	10 (7.2)
8. My fellow physiotherapists cooperate in applying the outcome measures	27 (19.6)	43 (31.2)	42 (30.4)	17 (12.3)	9 (6.5)
9. My supervisor/manager(s) cooperate(s) in applying the outcome measures	35 (25.4)	44 (31.9)	33 (23.9)	17 (12.3)	9 (6.5)
10. The standardized outcome measures have helped me in clinical decision-making	51 (37.0)	63 (45.7)	16 (11.6)	3 (2.2)	5 (3.6)
11. There is a risk that the use of outcome measures will be used for disciplinary actions against physiotherapists	14 (10.1)	31 (22.5)	34 (24.6)	30 (21.7)	29 (21.0)
12. The limited resources (ie, availability of equipment) hinder me from using standardized outcome measures	25 (18.1)	49 (35.5)	41 (29.7)	15 (10.9)	8 (5.8)
13. The outcome measures fit in with my daily practice routine	28 (20.3)	51 (37.0)	42 (30.4)	11 (8.0)	6 (4.3)
14. I am willing to use the standardized outcome measures in my daily practice routine	40 (29.0)	64 (46.4)	22 (15.9)	7 (5.1)	5 (3.6)
15. he use of standardized outcome measures improve communication between patients and therapists	55 (39.9)	53 (38.4)	23 (16.7)	3 (2.2)	4 (2.9)

Discussion

This study assessed the use of SOMs by physical therapists in a stroke rehabilitation setting. A total of 138 physiotherapists working in Saudi Arabia participated in the survey. Almost half of the participants worked in private facilities and had 1–5 years of experience. The results of the current study showed that the majority of participants used at least one SOM and almost half of the included participants used ≥ 10 outcome measures in their daily practice.

Use of SOM

The results of the current study showed higher rates of SOM use than international data. For instance, a study in the UK explored the use of outcome measures in stroke rehabilitation and reported that only 33% of physiotherapists used at least one measure, with a mean of 3.6 number of measures reported.[24] A more recent study in Ghana showed that only 47.6% of physiotherapists used the recommended outcome measures, and 29.5% did not use any outcome measure for any of the stroke patients.[12]

The most commonly used outcome measures in the current study were the AS, BBS, and FIM which agrees with the findings of Ntsiea et al findings in a mixed-method study that identified the commonly used SOM in the rehabilitation of individuals with stroke in South Africa.[25] They reported that Modified AS (84%) and BBS (96%) were the most commonly used outcome measures by physiotherapists.[25] In Ghana, the BBS was reported as one of the top five commonly used outcome measures in stroke rehabilitation, with only 12% of physiotherapists using BBS.[12] Furthermore, BBS has been reported as the most frequent outcome measure used by the health professionals working in stroke rehabilitation in UK by 23%.[24]

On the other hand, the least-used scale in the current study was the FMA-UE, as only 37% of respondents used it. Similarly, only 28% of physiotherapists in South Africa used FMA.[25] This finding could be justified by the time taken to complete this outcome measure in its original version, as it takes approximately 30 minutes to administer.[26]

More specifically, the current study showed that the AS and 5XSST were used mainly in the acute stage of stroke, whereas the Six-Minute Walk Test was mainly used in the chronic stage. This is in line with the recommendations of the APTA, which recommend the use of these scales in both acute and chronic stages post-stroke.[5] The use of the 6MWT, mainly in the chronic stage, could be justified by the lack of space to administer the test in the setting of inpatient rehabilitation during the acute stage.[25]

Participant Characteristics Influencing the Use of SOM

Poisson regression analysis showed that working in private facilities and managing more than 10 strokes per week were associated with a higher odds of using more SOM in clinical practice. This result disagrees with the results reported by Braun et al, who showed that physiotherapists who work in outpatient and private practice are less likely to use SOM frequently than physiotherapists working in an inpatient hospital or rehabilitation clinic.[13] In the other hand, our findings regarding the number of stroke patients managed per week was agreed with the results of two studies that reported the number of patients managed per week was associated with the use of outcome measures among physiotherapists in Ghana ($p = 0.013$) and Germany ($p = 0.008$).[12,13]

Education level, and work experience were not associated with the use of a higher number of SOM in clinical practice in the current study. Our results agree with those reported by Braun et al, who showed that work experience is not independently associated with the frequent use of SOM.[13] Furthermore, a recent study that assessed the use of SOM for stroke rehabilitation among physiotherapists in Ghana found that educational level was not associated with SOM use.

In terms of the number of scales unknown to physiotherapists, regression analysis showed that physiotherapists with higher degrees of education, less work experience, who work in the government sector, and who manage fewer than 10 stroke patients per week are more likely to have a higher number of unknown scales. There may be a link between having a master's or doctorate degree, less work experience, and knowing fewer outcome measures. The education system in Saudi Arabia mandates full-time study, and those engaged in postgraduate programs must take educational leave, resulting in less work experience and less clinical practice, thereby limiting

their familiarity with these scales and their usage. In Austria, a survey of members of the Austrian physical therapy Association with 588 participants (26% have postgraduate degree and 68% have more than 10 years' experience) showed that more than 17% of participants disagreed with the statement, "I know of standardised assessment tools in my area".[27]

Facilitators and Barriers to Use the SOMs

Facilitators and barriers to SOM use exist at the individual and organizational level. At the individual level, a positive attitude toward the use of SOMs and the perceived benefit of the use of SOMs in clinical decision-making were strongly pronounced facilitators in the current cohort of neurorehabilitation physiotherapists in Saudi Arabia. The positive attitude toward using SOMs could be justified by the sufficient knowledge and training that the participants had, as more than 70% of them reported to have sufficient knowledge and training to use the SOMs. Furthermore, cooperation from fellow physiotherapists and supervisors in applying SOMs was reported by more than half of the participants and was shown to facilitate the use of SOMs.

According to participants, the SOMs optimize the communication between therapists and patients, which is similar to the results of previous studies.[8,15,28,29]

At the organizational level, time restrictions and limited resources (ie, availability of equipment) were the most pronounced barriers in the current study. These findings are similar to those of a study by Ntsiea et al, who found that lack of time and unavailability of instruments in practice were the most important barriers to the use of SOM for physiotherapists.[25]

Limitations

One of the limitations of the current study is the use of a SOM questionnaire, although previous studies used a similar questionnaire.[8,13,18,25,29] The questionnaire did not capture the frequency of the use of SOMs in clinical practice. For example, therapists did not comprehensively report the SOMs usage times per week, number of patients, or time period. Therefore, it is recommended that the scale be revised and modified to add the frequency of usage to comprehensively measure the usage of SOMs among physiotherapists. Another limitation is the small sample size, as this study included only 138 physiotherapists and the majority of participants were from the Riyadh region. While the power calculation suggested a sufficient sample size, the actual number of responders fell short for controlling for more extraneous variables. Furthermore, the most respondents treated ≤ 10 stroke patients per week which could affect their familiarity with the SOMs used in stroke rehabilitation. Thus, the results are not generalizable to other neurological physiotherapists in Saudi Arabia. In addition, the results of the present study were dependent on participants' self-reported data which sometimes differed from reality. Future work should utilize quality assurance data and reports to extract the use of SOM among therapists working with stroke patients.

Implications for Clinical Practice and Research

There was a positive attitude toward using SOM for decision-making (Table 4, items 10–15). At the organizational level, sufficient time and resources are needed to enhance the use of SOMs among physiotherapists. There is a need for a toolkit that includes recommended standardized outcome measures and the use of electronic health systems to enable all physiotherapists to access them easily.

Conclusion

The use of standardized outcome measures is an integral part of clinical practice that can help physiotherapists in clinical decision making and optimize communication with patients. Neurological physiotherapists in Saudi Arabia are aware of the importance of using SOMs and have a positive attitude toward using SOMs. The most commonly used outcome measures among neurological physiotherapists in Saudi Arabia are the Ashworth scale, Berg balance scale, and functional independence measures. A lack of time and resources is the most common barrier to the use of SOMs. There was an association between therapist characteristics, type of facility, and likelihood of using SOMs.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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The authors declare that they have no competing interests.

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