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Current use of outcome measurements by physiotherapists working in Sri Lanka: An analytical cross-sectional study

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Abstract
In physical therapy, outcome measurements (OM) are essential for measuring patient's condition over time, quantifying observations, improving communication, and optimizing patient care efficiency. This study aimed to identify the current use of outcome measurements and to investigate the facilitators and barriers for the use of OM among physiotherapists working in Sri Lanka. A cross-sectional study was conducted among physiotherapists who were recruited from government and private hospitals through a validated survey questionnaire. Descriptive statistics and binary logistic regression were performed using SPSS. The sample comprised 77 participants (males=32.5%; females=67.5%). Ninety-seven percent of the respondents used OM in their clinical practice. Outcome measurements were mainly applied to identify the baseline health status, and diagnostic purpose by 59 (26%) and 58 (25.6%) of respondents, respectively. The three most frequently reported OM were "range of motion/goniometric value" (12.8%), "manual examination of muscle strength" (12.1%) and "visual analogue scale/numeric analogue scale" (10.9%).Physiotherapists' positive perspective towards OM was the main facilitator (95%). The other facilitators were sufficient knowledge to use OM (87%) and adequate training in the use of OM (80%). The main barrier to using OM was time constraint (58%) during the treatment. The working setting and the number of patients treated per day was independently associated with frequent use of OM ($P<0.05$). The relatively high use of OM, positive perspective, adequate knowledge and skills to administer OM as facilitators, as well as time constraint as a perceived barrier to use OM, were all significant findings in this study.

Keywords: outcome measurements, physiotherapy, barriers, facilitators, Sri Lanka

Introduction
Outcome measurements (OM) are tools for assessing a person's overall health, including impairments, activity limits, participation, and quality of life (Braun *et al*, 2018) [1]. Clinical diagnosis, evaluating the success of healthcare interventions, and predicting prognoses can all be done with OM. As a result, the use of OM is an integral aspect of evidence-based practice, and OM are regarded as instruments that aid in clinical decision-making. Regular monitoring of patients' health status using OM is part of a successful clinical practice pattern in physiotherapy. However, evidence from diverse research undertaken in countries such as New Zealand, Nigeria, Germany, Saudi Arabia, and the United States suggest that physiotherapists utilize OM infrequently (Braun *et al*, 2018; Copeland *et al*, 2015; Jette *et al*, 2015; Odole *et al*, 2018) [1, 2, 4].
Many of these devices/measurements have also been developed to be used by patients with the various illnesses that physiotherapists treat (Jette *et al*, 2015). In previous studies, goniometry, visual/numeric analog scale, and manual muscle strength were used by a large percentage of respondents, whereas measures like the Functional Independence Measure (FIM), 6-minute walk test, Disabilities of the Arm, Shoulder and Hand (DASH), and Barthel index, McMaster Osteoarthritis Index, Chedoke McMaster Stroke Assessment, and SF-36 Health survey were used by a small percentage of respondents (Braun *et al*, 2018; Odole *et al*, 2018) [1, 4].
The degree of knowledge and expertise of physiotherapists, insufficient additional financial compensations, and the need for extra time to document/time-consuming are the most significant barriers described in the previous studies. Facilitators include having a positive attitude toward OM, communicating with the patients, having access to better therapeutic knowledge and patient progression were reported in the literature (Al-Muqiren *et al*, 2017; Braun *et al*, 2018) [5, 1].
Information on the usage of OM and the facilitators and barriers to using OM among physiotherapists in middle and low income countries is limited. Also, there is no research available on the usage of OM among physiotherapists in Sri Lanka. Therefore, the aims of this cross-sectional study were to: i) document the current OM used by physiotherapists in Sri Lanka ii) determine the facilitators and barriers of using OM among physiotherapists.

Materials and Methods

Study Design

An analytical cross-sectional study was conducted with convenience sampling to recruit the participants. An online survey was done to identify the current use of OM by physiotherapists in Sri Lanka and related facilitators and barriers of application of OM. Ethical clearance was obtained from the ethical review committee, Faculty of Medicine, University of Colombo (No EC-21-084).

Participants

The study sample comprised of all the Sri Lanka Medical Council (SLMC) registered physiotherapists who were currently working in full-time in public and private hospitals and had more than 6 months (intern physiotherapists) working experience in Sri Lanka. Physiotherapists who were not willing to participate, working only in academic/universities and physiotherapists, who were on long-term leave were excluded from the study.

Survey Instruments

The questionnaire was developed based on previous studies (Braun *et al*, 2018; Copeland, Taylor and Dean, 2008; Swinkels *et al*, 2011) [1, 2]. The questionnaire was consisted of three main parts and included more than 30 items with all three languages (English, Sinhala and Tamil).

Part one of the questionnaire was captured socio-demographic characteristics of the physiotherapists including age, gender, level of education, work experience, type of facility/sector and quantity and quality of patients treated per day. Usage of OM by the physiotherapists was included in the second part of the questionnaire. The number of OM using, type of the OM and the purpose of the using such OM were assessed. In the final section of the questionnaire (part 3), information on facilitators and barriers for the usage of OM in physiotherapy were assessed. Here the participants expressed their opinions and attitudes on several statements on a 5-point Likert scale: "agree," "strongly agree," "neutral," "strongly disagree" and "disagree."

The questionnaire was pretested with five physiotherapy academic staff members who were not working in hospitals and pilot tested with five physiotherapists from public sector and private sector with similar characteristics as the participants of the study. The feedback received from the pretest and the pilot test were used to modify the wordings and structure of the questionnaire for better understanding.

Procedure

Prior to the data collection participants were contacted over the phone to inform about the study and the information sheet was emailed to all the potential participants. After obtaining the informed verbal consent the questionnaire was either emailed or sent via social media to the participants or administered through telephone according to their preference and convenience. Data was collected through online survey and via telephone interview for two and half months. A reminder was sent to the participants after two weeks if the completed questionnaire was not returned. The data were collected from August to November 2021.

Statistical Analysis

Data were analyzed using the statistical package for the social science software (SPSS) V.16. Descriptive statistics were performed and mean standard deviation and percentage were calculated. Descriptive statistics were used to analyze the prevalence of OM usage, socio-demographic data of the respondents and the OM used. The results on barriers and facilitators of OM usage in clinical practice were presented as frequencies of responses. The impact of gender, educational level, work experience, work setting (public/private), and the number of patients treated per day, and main type of patients treated on the use of OM in clinical care were estimated using binary logistic regression analyses. $P < 0.05$ was considered for significant level.

Results

A total of 81 responses were received out of 182 questionnaires giving the response rate of 44.5%. Seventy-seven completed questionnaires were used for the data analysis.

Table 1 presents demographic and work-related characteristics for all participants. Out of 77 participants responded, 52 (67.5%) were female and 25 (32.5%) were male. The majority of the participants were below 30 years of age (45.5%) and degree holders (63.6%). There were 43 (55.8%) participants who had 1-4 years of working experience and 59 (76.6%) working in government/public sector.

Table 1: Demographic and work-related characteristics of participants

Variable	Description	Frequency	Percentage
Gender	Male	25	32.5%
	Female	52	67.5%
Age	Below 30yrs	35	45.5%
	31-40 yrs.	28	36.4%
	41-50 yrs.	9	11.7%
	More than 50 yrs.	5	6.5%
Highest Academic Qualification	Diploma	17	22.1%

	Degree	49	63.6%
	Masters	6	7.8%
	Postgraduate	5	6.5%
Working experience	1-4 years	43	55.8%
	5-10 years	16	20.8%
	11-15 years	5	6.5%
	16-20 years	9	11.7%
	Above 20 years	4	5.2%
Type of facility/primary setting	Government/Public	59	76.6%
	Private	18	23.4%
No of patients per day	No patients	0	0
	1-5	9	11.7%
	6-10	23	29.9%
	11-15	24	31.2%
	16-20	10	13%
	21-25	7	9.1%
	> 25	4	5.2%
Main type of patients treating [a]	Musculoskeletal	63	16.9%
	Neurological	65	17.5%
	Pediatric	44	11.8%
	Cardio-respiratory	44	11.8%
	Sports	34	9.1%
	ICU	48	12.9%
	Gynecology and obstetrics	31	8.3%
	Medical and surgical conditions	43	11.6%
Age group of patients treating [a]	Infants (<6 years)	28	12.4%
	Children (6-13 years)	33	14.7%
	Adolescents (14-17 years)	38	16.9%
	Adults (18 - 65 years)	73	32.4%
	Older age (> 65 years)	53	23.6%

Values are the total numbers (percent) or indicated otherwise. Mean values are given with the standard deviation (range), and median values are given with the interquartile range. [a] Multiple answers possible.

Usage of Outcome Measurements

The usage of outcome measurements in general practice was found among 97% of respondents (75/77). Figure 1 is illustrates the usage of frequency of outcome measurements. In total 26 (33.8%) participants used OM in > 80% of patients, and 11 (14.2%) used OM in < 20% of patients.

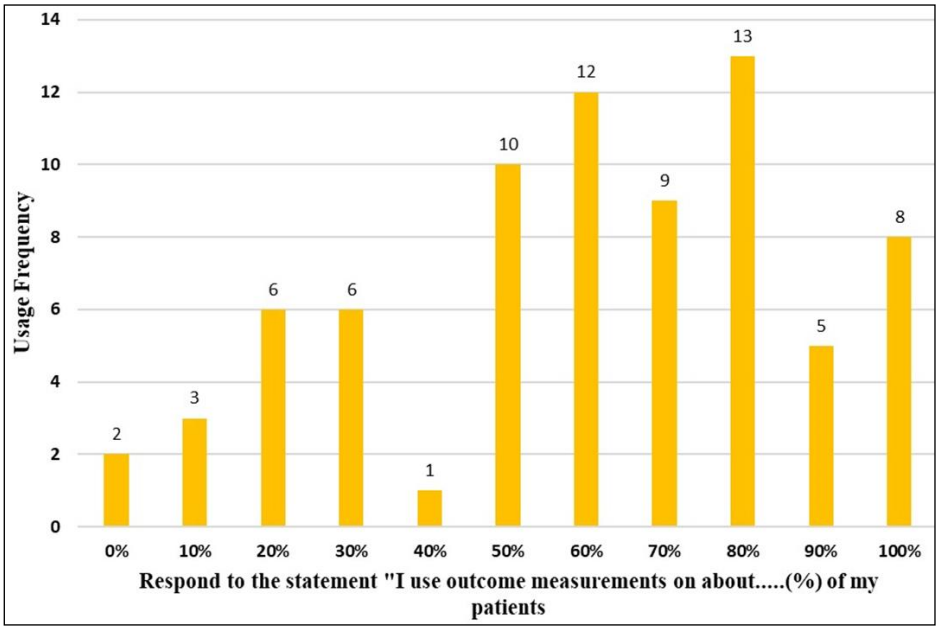

Fig 1: Frequency of using outcome measurements. A data set generated by responding to the statement "I use outcome measurements on about ….. (%) of my patients".

Outcome measurements were used for baseline health status, diagnostic, prognostic and evaluate effect of intervention by 59 (26%), 58 (25.6%), 55 (24.2%) and 55 (24.2%) respondents respectively. Majority of the physiotherapists (n=35, 45.5%) were used 3-5 OM during their clinical practice. Participants were asked to select the frequency of using OM from a given list of OM and they were allowed to report additional OM in addition to the list. The three most frequently reported OM were "range of motion/goniometric value" (12.8%), "manual examination of muscle strength/manual muscle testing (MMT) " (12.1%) and "visual analogue scale/numeric analogue scale" (10.9%). Table 2 shows frequency of outcome measurements used by the participants.

Table 2: Outcome measurements used by the participants

Current use of Outcome Measurements	Responses	
	n	Percent
Range of motion/Goniometric scale	72	12.8%
Visual analogue scale/Numeric analogue scale	61	10.9%
Manual muscle testing (MMT)	68	12.1%
Dynamometry	7	1.2%
Oswestry	9	1.6%
McGill	9	1.6%
American Spinal Cord Injury Association Impairment Scale (ASIA)	37	6.6%
Modified Ashworth scale	48	8.6%
Glasgow Coma Scale (GCS)	28	5.0%
Barthel index	24	4.3%
Berg balance scale	37	6.6%
Timed up and go test (TUG)	20	3.6%
Six minute walk test	31	5.5%
Ten meter walk test	3	.5%
Incentive meter	37	6.6%
Lung vital capacity	18	3.2%
Cobb's angle	28	5.0%
SF-36	3	.5%
Disabilities of the Arm, Shoulder and Hand (DASH)	10	1.8%
Y Balance	11	2.0%

Values are the total numbers (percent) or indicated otherwise. Multiple answers possible.
n=number of respondents

Facilitators and barriers

Relevant facilitators and barriers for implementation of OM were identified and ordered into six categories (therapist perspective, knowledge and skills, therapeutic setting, organizational structures, clinical reasoning, and interdisciplinary action/professional discipline). Physiotherapists' positive perspective towards OM was the main facilitator (95%). The other facilitators were, sufficient knowledge to use OM (87%) and well trained to use the OM (80%). The main barrier was time-consuming for therapist (58%) during the treatment.

Participants' Demographic and Work-Related Characteristics Influencing the use of Outcome Measurements

The variable gender (P=0.197), education level (P=0.289) and working experience (P=0.601) were not independently associated with frequent use of OM, while work setting and number of patients treated per day were independently associated (P<0.05). The odds of a frequent use of OM are listed in Table 3. Work setting of participants was related to the likehood of using OM frequently. Compared with physiotherapists who were working in government sector, private sector physiotherapists were nearly 11 times more like to use OM frequently.

Chi-square goodness-of-fit test (Hosmer-Lemeshow test: $chi^2 = 2.707$; $p = 0.911$) and Nagelkerke R^2 generalized coefficient of determination (R^2=0.434) indicate that these factors explained 43% of the variance in the regression model.

Table 3: Odds of frequent use of outcome measurements by participants characteristics (Results of the binary logistic regression analysis)

Variable/Factors		Odds ratio	P value	95% Cl	
				Lower	Upper
Gender	Male	Reference	0.2		
	Female	0.264		0.04	2.000
Education level	Diploma	Reference			
	Degree	0.3	.173	.05	1.721

	Masters	0.1	.182	.005	2.714
	Postgraduate	1.8	.732	.056	60.198
Working experience	1-4 years	Reference			
	5-10 years	0.2	0.1	0.01	1.615
	11-15 years	0.9	0.9	0.05	14.349
	16-20 years	0.5	0.5	0.05	4.918
	Above 20 years	0.3	0.5	0.01	8.298
Work setting	Government/Public	Reference			
	Private	11.154	0.006	2.009	61.945
Number of Patients treated per day	1-5	0.02	0.02	.001	0.591
	6-10	0.06	0.05	.004	1.074
	11-15	0.02	0.01	.002	0.559
	16-20	0.14	0.22	.006	3.327
	21-25	0.01	0.02	.000	0.574
	> 25	Reference			

Abbreviations: CI confidence interval
Goodness-of-fit statistics: chi2 = 2.707; p = 0.911; R2 = 0.434
Note that each factor is adjusted for the remaining variables in the model
Significant difference at p-value < 0.05

Discussion

The aims of the present study were to identify the current use of outcome measurements in physiotherapy and to determine the facilitators and barriers for the usage of outcome measurements among physiotherapists working in Sri Lanka.

According to the results of this study, 97% of participants were using outcome measures in their clinical practice. Among them 26 (33.8%) participants used OM frequently (>80% of patients), and 11 (14.2%) used OM very rarely (<20% of patients). This result is higher than the usage frequencies reported in most of the previous studies. In German, Braun *et al*. (2018) [1] reported that 86% of respondents used OM and 31% and 26% of the respondents were used OM frequently and rarely respectively. Al-Muqiren *et al*. (2017) [5] reported that 62% of physiotherapists in the Saudi Arabia were used standardized outcome measures (SOM) in their clinical practice. In contrast, a study done by Copeland *et al*. (2008) [2] in New Zealand showed that 40% of the respondents reported using back-related outcome measures. Another study found that 48% of physical therapists in the United States used outcome measures in their clinical practices (Jette *et al*, 2009) [3].

In the present study the majority were below 30 years of age (45.5%). Hence most of the participants were within few years of their studies, there is a high possibility of knowing relevant theories and practical guidelines related to usage of OM. Therefore, this might be the reason of higher usage of OM in the current study compared to the other studies done in various other countries.

The results of the current study indicate that OM were mainly applied to identify and quintile the baseline health status (impairment, activity limitation, participation, personal factors), and diagnostic purpose. A similar finding was observed in a study conducted in Germany by Braun *et al*. (2018) [1] OM were mainly applied for diagnostic purpose.

In the present study, three most frequently reported OM were "range of motion/goniometric value" (12.8%), "manual examination of muscle strength/MMT" (12.1%) and "visual analogue scale/numeric analogue scale" (10.9%). The findings of our study is in line with other studies (Blum *et al*, 2008; Braun *et al*, 2018; Douglas *et al*, 2005; Swinkels *et al*, 2011) [1]. The contrast with the study by Jette *et al*. (2009) [3], in which most frequently used OM were Oswestry Low Back Disability Index (ODI) (41.3%); Lower Extremity Functional Scale (LEFS) (18.8%); Disabilities of the Arm, Shoulder, and Hand (DASH) (18.3%); and Berg Balance Scale (BBS).

Positive perspective about OM, as well as sufficient knowledge and skills to administer OM, were found to be strong facilitators in the current study. The similar findings were observed in previous studies conducted by Braun *et al*. (2018) [1], Al-Muqiren *et al*. (2017) [5], Duncan and Murray (2012). In the present study, respondents generally agreed to the statement that the patient's individual treatments goals to be well integrated and patients are motivated by the use of outcome measurements. According to the Duncan and Murray (2012) study, those statements were included as managerial level facilitators. During treatments, the most significant barrier was observed to be time consuming for both patients and physiotherapists. Similarly, in prior studies, physiotherapists have cited a lack of time as the most common barrier to use OM (Al-Muqiren *et al*, 2017; Braun *et al*, 2018; Jette *et al*, 2009) [5, 1, 3]. In addition, Sri Lankan physiotherapists were believed that the OM could support patients' communication to increase the efficiency of examination and treatment, to attain better patients' outcome and to motivate patients, were similar to the results of previous studies (Al-Muqiren *et al*, 2017; Braun *et al*., 2018; Duncan and Murray 2012) [5, 1].

Regression analysis revealed that the work setting and the number of patients treated per day were both independently associated with the frequent use of OM. This result is contrast with the findings of previous studies (Al-Muqiren *et al*, 2017; Braun *et al*, 2018; Copeland *et al*, 2008; I. Kall *et al*, 2016; Jette *et al*., 2009,) [5,

[2, 1, 3]. For example, I. Kall *et al*. (2016) reported that there was no significant differences in use of outcome measures related to age, educational level or primary care work experience. The studies done by Copeland *et al*. (2008) [2] and Al-Muqiren *et al*. (2017) [5] found that having a master's degree/ educational level significantly impact on use of OM in clinical practices.

In the present research, participants who worked primarily in the private sector were eleven times more likely to use OM than those who worked in government hospitals. This contrast with the study by Braun *et al*. (2018) [1] in which participants working predominantly in an inpatient/hospital setting were approximately four times more likely to use OM than in the outpatient/privet practice setting. Another study done by Al-Muqiren *et al*. (2017) [5] in Saudi Arabia reported that the use of OM in private clinics was lower than other clinical settings.

In the present study higher usage of OM in the private clinics may be due to the facilities in private settings compared to the government sector and having adequate time for assessment of patients due to high quality of administration in private sector in Sri Lanka. The less usage of OM in the government sector may be due to lack of time with higher number of patients in government hospitals.

Limitations of the Study

This is the most recent study to examine the usage of OM by physiotherapists in Sri Lanka. There were some potential limitations. One limitation of this study was the relatively small sample size. The low response rate might be due to physiotherapists' tight work schedules and the fact that they were preoccupied with household duties in their spare time. Furthermore, it depends totally on convenience sampling which we could approach through our professional contacts only. Online data collection is another limitation which may limit the responses. This might have only increased the response rate of younger physiotherapists and who a familiar on online surveys.

We highly recommend to carry out a similar study with a large sample and with more standard outcome measures used by physiotherapists. Furthermore, it is suggested to carry out a comparative study on use of outcome measurements between government and private sector physiotherapists in Sri Lanka.

Implication for Physiotherapy Practice

Good knowledge and skills in using OM is considered as facilitators. Time-consuming for therapist was the main perceived barrier to use OM. Range of motion is the commonest OM used by Sri Lankan physiotherapists. However, there is need for variety of standard OM for getting better outcomes from the patients and sufficient time resource is required.

Conclusion

In conclusion, the results of our study revealed a high percentage of physiotherapists in Sri Lanka use outcome measurements during their treatments. Positive perspective toward OM, as well as adequate information and skills to administer it, were discovered to be powerful facilitators. The main perceived barrier to using OM was the time constraint during the treatment by physiotherapists. Work setting and the number of patients per day treated by physiotherapist had a high probability of using OM.

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