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Awareness of Standardized Outcome Measures for Balance: A Survey among Physical Therapists in Karachi

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ABSTRACT

Background of the study: Balance impairments affect approximately 75% of individuals aged 70 and above. Due to their high prevalence and impact on function, physiotherapists prioritize balance assessments to aid diagnosis, treatment planning, and fall risk management. Standardized outcome measures help identify the type and cause of balance disorders and guide effective interventions. This study aims to assess physiotherapists' awareness of such tools.

Methodology: A cross-sectional study was conducted in major hospitals across Karachi, including IPM&R, Civil Hospital Karachi, JPMC, and others. A purposive sample of 246 physiotherapists participated through a self-designed questionnaire. Ethical approval was obtained (IRB No. FMRL-IRB/2025/010), and informed consent was secured before data collection.

Results: About 72.31% of physiotherapists reported sufficient awareness of outcome measures for balance assessment, while 27.69% did not. No significant association was found between gender, qualification, and work experience with knowledge of balance components. However, professional experience was significantly associated with awareness of balance assessment.

Conclusion: Most physiotherapists demonstrated good awareness of standardized balance assessment tools. Nonetheless, a considerable number would benefit from additional training and education to enhance clinical competence in this area.

Keywords: *Balance, Core Stability, Cognition, Outcome Measures, Posture, Vertigo.*

INTRODUCTION

Human balance is a multifaceted concept, related to the maintenance of posture, transitioning between positions, and not falling when something unexpected happens[1]. Balance is necessary to stand upright and walk[2]. The vestibular system is a sensory system that offers the main contribution to the sense of balance and spatial orientation[3]. The capacity to keep the center of mass of the body inside the base of support is necessary for postural equilibrium and maintaining balance; failing to do so will result in a fall[4]. With the global increase in the geriatric population, disorders related to aging are also rising. Falls are one of the most common problem in the geriatric population. Global prevalence of fall is 26.5% (95% CI 23.4–29.8%), with the highest rate of fall in Oceania, 34.4% (95% CI 29.2–40%), and the USA, 27.9% (95% CI 22.4–34.2%)[5]. Prevalence of fall in Pakistan is 42.6% among elderly population[6]. Assessing balance problems

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is crucial for older adults because falls are the major cause of accidental death in this age group. Falls can lead to serious injuries, limit movement, and increase hospitalization. Identification of risk factors is a necessary part of rehabilitation, achieved through functional clinical testing involving the motor, visual system, vestibular system, and proprioception[7]. The vestibular system detects and encodes head and body movements, relaying this information to the central nervous system. It works in conjunction with other sensory systems to maintain balance and stable vision[8]. Age-related changes or pathologies affecting these systems often present with balance complaints[9]. Balance encompasses static stability, symmetry, and dynamic stability[10]. Normal stance relies on sensory inputs from 3 different systems: visual system, proprioception, and vestibular system[11]. Several tools have been developed to assess and predict balance issues, such as the Balance Evaluation Systems Test (BES Test) evaluates six balance domains. Including biomechanical constraints, stability limits, uprightness, Predictive postural adjustments, involuntary postural responses, sensory organization, and gait stability[12-13]. Berg Balance Scale (BBS) consists of 14 different tasks designed to evaluate a person's ability to maintain balance safely. The Timed "UP & GO" Test (TUG) involves standing, walking 3 meters, turning around, and then sitting back down. Performance-Oriented Mobility Assessment (POMA) is a balance assessment focused on specific tasks (SOT). The Single-leg stance test evaluates balance while standing on one leg.13 Clinical Test of Sensory Interaction and Balance (CTSIB) is an effective tool for assessing postural sway while standing still. 14 The Fear Avoidance Scale (FAS) and Romberg test are the most commonly used and validated tools for proprioception[15]. Valid and reliable outcome measures for clinical assessment are required for evidence-based practice.[16] Most clinical practice guidelines for fall prevention consider balance assessment a crucial part of evaluating fall risk. Healthcare professionals, particularly physical therapists, are essential in evaluating and implementing strategies to minimize the risk of falls in older adults[17]. Individuals identified as high risk should receive a thorough multifactorial falls risk assessment to develop and implement tailored, multi-domain interventions[18]. Balance assessment is required for diagnosis, treatment plan reassessment, pinpointing the risk of falls, and changes that occur over time. Balance assessment tools that distinguish between the types and causes of the problem of balance can help guide the types of interventions, more effective management, or treatment of balance disorders[19]. In elderly patients prevalence of falls due to loss of balance and coordination from various pathologies is very common, which can be improved from proper rehabilitation[20]. But often goes undiagnosed. Awareness of assessment and measurement tools is a crucial component of the rehabilitation of patients[21]. According to the authors' knowledge, there is limited data regarding physiotherapists' awareness and their use of balance assessment tools in Karachi. There is also a lack of published surveys regarding knowledge and practices. This survey identifies the awareness among physical therapists regarding the use of standardized outcome measures to assess balance, as it aims to fill the gap by providing baseline information regarding awareness and use. This study will guide future practitioners to strengthen evidence-based practice.

METHODOLOGY

Data for this cross-sectional survey design were collected using a (self-administered) questionnaire. Physiotherapists from IPM&R, Civil Hospital Karachi, JPMC, NICH, Acelp, Dow University hospital, Dr. Ziauddin Hospital, BIDE, Liaquat National Hospital, Aiwan-e-Sanat-o-Tijarat Hospital, Al-Mustafa Hospital, Agha Khan Hospital, NICVD, Sindh government Hospital, IOS, Al-Mumtaz Medical Complex, and Services Hospital were included in this study. Sample size of 246 calculated through Open Epi version 3.0 with a hypothesized frequency of 80% (physiotherapists using standardized questionnaire), confidence limits of 5%, data effect of 1% and confidence level 95%[22]. Purposive sampling technique was used to collect the data from the qualified Physiotherapists holding a professional degree. Physical therapists who were actively engaged in clinical practice and academic activities were considered eligible for this study.

Physical therapy Technicians, assistants, and diploma holders were excluded. This study adheres to established ethical principles and international guidelines for human research, including the Declaration of Helsinki and Good Clinical Practice standards. Prior to participant recruitment, ethical approval was obtained from the Institutional Review Board under Protocol Number FMRL-IRB/2025/010. A total of 246 physiotherapists were included in the study. Permission was obtained from the department heads, and a list of physiotherapists currently working in their clinical settings was provided. After receiving the necessary permissions, the questionnaires were distributed to those who met the inclusion criteria, and the purpose of the study was explained while consent was obtained. Data was entered and analyzed using SPSS 16.0. The counts and percentages were reported for categorical variables. Pearson chi-square test was used to see the association of gender, qualification, and work experience with the component of balance to assess. P-values less than 0.05 were considered significant. Pie chart was used to give a graphical representation of data. A self-administered questionnaire was adopted from a previously published study, in which a pilot study was conducted to assess the validity of the questionnaire,[22] and it is used to assess the awareness of standardized balance outcome measures and to collect data from practicing settings. It included 12 closed-ended questions derived from the literature and was divided into 2 parts, one assessing the demographic details and the other assessing the awareness of physiotherapists. A consent form was provided along with the questionnaire. The questionnaire covers all components in five categories that are sensorimotor control system (vision, proprioception, vestibular system), cognition (Fear), posture (Alignment), stability (Static, Dynamic), and reactive control (ankle strategies, Hip strategies, stepping). Physical therapists state the frequency of the five components. 22.

RESULTS

In data received from 246 physiotherapists, 72.31% of the physiotherapists reported being sufficiently aware to use an outcome measure tool to assess components of balance in patients, while the remaining 27.69% did not assess balance components. Baseline information of the participants including age, gender, qualifications and work experience is given below (Table-1, Figure-1).

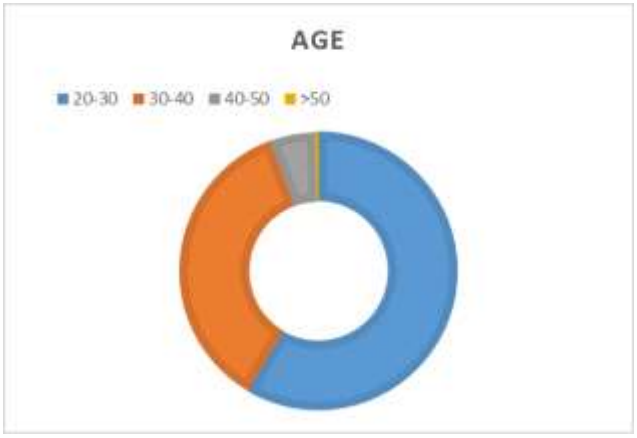

Figure-1 Age of the participants

Table 1: Demographics and practice characteristics of participants		
	Frequency	*Percent*
Gender		
Male	134	54.5
Female	112	45.5
Total	246	100.0
Qualification		
BSPT	81	32.9
DPT	38	15.4
MSAPT	51	20.7
MSCPT	30	12.2
PPDPT	35	14.2
MPHIL	4	1.6
PHD	7	2.8
Total	246	100.0
Work experience		
1-5	129	52.4
5-10	74	30.1
10-20	37	15.0
>20	6	2.4
Total	246	100.0

There was no significant association found between gender, qualification, and work experience with the component of balance for assessment. There was only a significant association present between the work experience and the scale used to assess patients with balance problems, having a p-value <0.001 (Table-2).

Table-2: Association of baseline characteristics with patients' assessment			
		Chi-square value	**P-value**
Assessment of patients with balance problems by therapists	Gender	4.313	0.743
	Qualification	39.297	0.59
	Work experience	52.77	<0.001
Components of the balance assessment	Gender	4.071	0.396
	Qualification	20.166	0.687
	Work experience	15.703	0.205

While assessing the Components of balance, it was found that most physical therapist focuses on posture and stability as the most commonly assessed components. And physical therapists had given less attention to the sensory motor control, reaction control, and cognition (Table-3).

Table-3: Frequency of balance assessment component most commonly assessed by physiotherapist		
		Frequency (%)
Balance Assessment Components	Posture	141 (57.3)
	Sensory Motor Control	25 (10.2)
	Stability	55 (22.4)
	Reaction Control	9 (3.7)
	Cognition	7 (2.8)
	Total	237 (96.3)

For the assessment of postural alignment, most of the physiotherapists rely on objective assessment rather than the postural grid (Table-4).

Table-4: Scale used for the assessment of postural alignment.

		Frequency (%)
Posture Alignment Components	Objective Assessment	163 (66.3)
	Postural Grid	61 (24.8)
	Total	224 (91.1)

To assess static stability most frequently used outcome measure was the Romberg test. Borg balance test and single leg stance test were the second most common outcome measures. While CTSIB, POMA BES test, TUG, SOT, and FAS are rarely used assessment tools (Table-5).

Table-5: Scale used by physiotherapists to assess static stability

		Frequency (%)
Scales	BBS	43 (17.5)
	CTSIB	9 (3.7)
	POMA	3 (1.2)
	SINGLE LEG STANCE	44 (17.9)
	BES test	5 (2.0)
	TUG	9 (3.7)
	ROMBERG TEST	111 (45.1)
	SOT	4 (1.6)
	FAS	5 (2.0)
	Total	233 (97.7)

For the assessment of dynamic stability most frequently used outcome measures are the Romberg test and Borg balance test, while the single-leg stance test was the second most common outcome measure (Table-6).

Table-6: Scale used by physiotherapists to assess dynamic stability

		Frequency (%)
Scales	BBS	69 (28.0)
	CTSIB	4 (1.6)
	POMA	9 (3.7)
	SINGLE LEG STANCE	46 (18.7)
	BES test	7 (2.8)
	TUG	20 (8.1)
	ROMBERG TSET	63 (25.6)
	SOT	4 (1.6)
	FAS	3 (1.2)
	Total	225 (91.5)

To assess static balance, 39.8% physiotherapists are using Romberg test, 10.6% BBS, 1.2% CTSIB, 5.3% POMA, 19.5% Single leg stance, 4.5% BES test, 7.3% TUG, 1.6% SOT, 2.4% FAS, while 7.7% are not using any scale. In assessing dynamic balance, 31.3% physiotherapists are using the Romberg test, 13.0% BBS, 4.5% CTSIB, 4.1% POMA, 20.3% Single leg stance, 2.0% BEST test, 11.4% TUG, 2.4% SOT, 2.4% FAS, while 8.5% are not using any scale. To assess reaction control, 26.0% physiotherapists are using TUG, 8.5% BBS, 4.9% CTSIB, 6.9% POMA, 14.6% Single leg stance, 6.9% BES test, 13.4% Romberg test, 3.3% SOT and FAS, while 12.2% are not using any scale. Cognition assessment was done by 14.2% physiotherapists by using TUG, 7.3% BBS, 8.5% CTSIB, 14.9% POMA, 7.3% Single leg stance, 3.7% BES test, 11.0% Romberg test, 9.3% SOT, 5.7% FAS, while 28% are not using any scale.

DISCUSSION

The study findings revealed some important aspects of balance assessment in an extensive sample of physiotherapists practicing in different clinical settings of Karachi. In this study recruited participants were more male therapist as compared to females. Which is similar in accordance with studies conducted on physical therapist in Pakistan. 23 more than 70 % of the physiotherapist were aware and used standardized outcome tool to assess balance for fall prevention which is similar to study conducted in USA where 89% of therapist conducted fall screening[24]. According to physiotherapists, majority of the patients seen with balance problems were aged around 60 years which is the most common age for frequent accidental fall and deaths. 25 More than 2/3rd of the physiotherapists assessed more than one component of balance that was important for functional activities, such as static and dynamic stability, postural alignment, sensory motor control, cognition, reactive control. This was similar in accordance with the study done in Ontario[22], however, some physiotherapists did not assess these aspects. Since the risk of falling involves multiple component, no single outcome tool can be sufficient to assess all component. Hence, using more than one outcome measure by the physiotherapist is strongly recommended[26].

Component of balance mostly assessed by more than half of the physiotherapists was posture while cognition and reaction control were assessed by very few physiotherapists in Karachi, similar results were found in the study in Ontario[22]. More than 1/4th of the physiotherapists used BBS to assess balance problems, some used single leg stance while fewer used POMA, CTSIB, Romberg test, SOT, FAS and TUG. More than half of the physiotherapists used objective assessment while 1/4th used postural grid to assess postural alignment. Up to half of the physiotherapists used Romberg test to assess static stability, Dynamic stability was assessed by 1/4th by using BBS, For static and dynamic balance most of the physiotherapists used Romberg test, Less than 1/3rd physiotherapists used TUG to assess reaction control, while cognition was also assessed by TUG by majority of physiotherapists. This study was conducted to identify awareness among physical therapists in Karachi. The results of this study will led to inform educational initiative, which will lead to Evidence based balance assessment. Which will help patients achieve better rehabilitation outcomes.

Study Limitations

The study only delivers quantitative data about what is done to assess balance, but does not explain the underlying factors influencing current practice. The study relies on self-reported awareness of respondent, which can introduce bias as they can overstate their knowledge or use of outcome measures tools.

CONCLUSION

The results of this study showed that the Majority of the physiotherapists have a good level of awareness; however, there is a significant number of therapists who were still not practicing balance assessment. Also, it is also found out that there is no significant association between gender, qualification, work experience, with the components of balance assessment; however, experience was significantly associated with the assessment of balance. To the best of our knowledge, there is limited data regarding physiotherapists' awareness and use of balance assessment tools in Karachi. This survey identified the physical therapists awareness of using standardized outcome measures to assess balance, this study aims to bridge the gap by providing baseline information on awareness which will in turn help future practitioners enhance evidence-based practice.

AUTHORS' CONTRIBUTION:
The following authors have made substantial contributions to the manuscript as under:
Conception or Design: Asma Batool, Aisha Batool
Acquisition, Analysis or Interpretation of Data: Asma Batool, Aisha Batool
Manuscript Writing & Approval: Aisha Batool, Asma Batool.

All authors acknowledge their accountability for all facets of the research, ensuring that any concerns regarding the accuracy or integrity of the work are duly investigated and resolved.

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