Original Article

Translation and Psychometric Analysis of Activities Specific Balance Confidence Scale (Abc-U) and Fall Efficacy Scale International (Fes-I-U) in Elderly

Rahila Suleman[1]*, Rida Razaq Janjua[1], Ayesha Shaukat[1], Aiman Raza[2], Anees Arshad[3], Arshad Nawaz Malik[4]

[1]Lecturer Physiotherapy, Islamabad College of Physiotherapy, Margalla Institute of Health Sciences, Rawalpindi, Pakistan.
[2]Physical Therapist, Islamabad College of Physiotherapy, Margalla Institute of Health Sciences, Rawalpindi, Pakistan.
[3]Islamabad College of Physiotherapy, Margalla Institute of Health Sciences, Rawalpindi, Pakistan.
[4]Principal, Faculty of Rehabilitation and Allied Health Sciences, Riphah International University Islamabad, Pakistan.
Corresponding Author: Rahila Suleman, Lecturer Physiotherapy; Email: rahilasuleman59@gmail.com
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ABSTRACT

Background: With the increasing elderly population globally, understanding and managing fear of falling and balance issues have become paramount, especially in countries like Pakistan. The Activities-specific Balance Confidence (ABC) scale is a widely recognized tool for assessing these concerns in older adults. However, there was a need for a version adapted to the Urdu-speaking population.

Objective: The study aimed to translate the ABC scale into Urdu and assess its psychometric properties to provide a reliable tool for evaluating fear of falling and balance confidence in Pakistani older adults.

Methods: This analytical study involved a sample of 120 elderly individuals, selected through non-probability convenience sampling from PAF Hospital Islamabad and local communities. Inclusion criteria were individuals aged 60 years or above, capable of walking with or without aid, and proficient in Urdu. Those with known pathologies affecting balance, psychological issues, vision impairments, or a history of fractures were excluded. The English version of the ABC scale was translated into Urdu following the COSMIN guidelines. Psychometric testing included evaluating internal consistency, test-retest reliability, and concurrent validity. Data analysis was performed using SPSS version 25.

Results: The Urdu version of the ABC scale showed high internal consistency (Cronbach's alpha > 0.90). The Standard Error of Measurement (SEM) for the complete tool was 2.40, with individual components ranging from 3.55 to 11.2. The Minimal Detectable Change (MDC95) for the full scale score was 6.4. Concurrent validity, assessed through correlation with the Fall Efficacy Scale International Urdu version (FES-I-U), revealed a strong negative relationship ($r = -0.80$, $p < 0.0001$). The mean normative value of self-perceived balance confidence among participants was 70.5.

Conclusion: The study successfully translated and validated the ABC scale into Urdu, providing a reliable and valid tool for assessing fear of falling and balance confidence among Urdu-speaking older adults in Pakistan. This adaptation is crucial for culturally sensitive geriatric care and fall prevention strategies.

Keywords: Activities-specific Balance Confidence scale, Urdu translation, psychometric properties, older adults, fear of falling, balance confidence, geriatric care.

INTRODUCTION

The global demographic shift towards an aging population has significant implications for healthcare systems, particularly in terms of fall prevention and management. The World Health Organization defines those aged 60 years and above as elderly, and it is projected that by 2050, the number of older adults worldwide may reach two billion, with the majority residing in developing countries, including a substantial proportion in Asia. In Pakistan, the elderly population, which constituted 5.6% of the total in 2012, is expected to double by 2025. Falls are a prevalent issue among this demographic, with 30 to 50% of individuals in nursing homes experiencing at least one fall annually, and 40% encountering multiple falls. The psychological impact of these falls, notably the Fear of Fall (FOF), is a critical concern, affecting 29 to 76% of the elderly. FOF can lead to a decline in self-confidence, increased feelings

of despair, restrictions in daily activities, and reduced mobility. Addressing these early warning signs is crucial for preventing recurrent falls and maintaining functional independence (1-5).

As individuals age, the risk of falls and their associated societal and personal consequences increase. Identifying and understanding the multifactorial causes of falls is essential. Among these factors, FOF stands out due to its propensity to create a detrimental cycle of inactivity and further fear, leading to physical and mental health decline (6-8). In response to this issue, Powell and Myers developed the Activities-specific Balance Confidence (ABC) scale in 1995. This tool, initially in English for a Canadian population, measures FOF by assessing confidence in performing various ambulatory activities without falling or feeling unstable. It is a 16-item, self-assessment instrument that gauges the confidence level (0 to 100%) of individuals in maintaining balance during different activities. The ABC scale was developed through consultations with physical and occupational therapists and their elderly clients, focusing on activities deemed essential for independent living but posing a risk of instability (9-13).

In 2019, an adaptation of the ABC scale was translated into Arabic, incorporating psychometric testing for older adults. This adaptation demonstrated high internal consistency (Cronbach α = 0.97), good structural coherence, excellent test-retest reliability (ICC = 0.98), and small standard error of measurement (SEM). Additionally, the scale showed significant differentiation between men and women and between fallers and non-fallers, with no floor or ceiling effects observed. The study also included a Rasch analysis for post-stroke individuals, affirming the scale's one-dimensional structure and reliability (0.93) (14-17). Another study in Iran focused on the Persian version of the ABC scale and the Fall Efficacy Scale International (FES-I) among people with multiple sclerosis. This study reported high intra-class correlation coefficients (0.96 and 0.93) and Cronbach alpha values (0.96 and 0.99), demonstrating the scales' reliability and significant correlations with other balance and mobility measures, without any significant floor or ceiling effects (18-20). A similar study in Arak city involving Persian-speaking older adults confirmed the reliability and validity of the Persian ABC scale, with high test-retest reliability (0.82), internal reliability (0.98), and correlation coefficients (21, 22).

The primary objective of the current study is to translate the Activities-specific Balance Confidence scale into Urdu, aiming to provide a culturally and linguistically appropriate tool for assessing FOF in the elderly population of Pakistan. The secondary objective is to evaluate the psychometric properties, namely the validity and reliability, of the Urdu version of the ABC scale in an elderly cohort. This endeavor is pivotal in enhancing fall risk assessment and implementing effective fall prevention strategies in a region with a rapidly aging population.

MATERIAL AND METHODS

This research followed an analytical design, focusing on a cohort of 120 older adults. The sampling method employed was non-probability convenience sampling, with the study conducted at the PAF Hospital Islamabad and within local communities. The participants comprised both male and female individuals aged 60 years and above, who were able to ambulate independently or with the aid of assistive devices and were proficient in Urdu. Excluded from the study were individuals with dizziness attributable to known balance-affecting pathologies, psychological disorders, vision impairments, or a history of fractures.

The methodology was structured into two phases. The initial phase involved the translation of the original English version of the Activities-specific Balance Confidence (ABC) scale into Urdu, adhering to standardized translation procedures to ensure linguistic and conceptual equivalence. This process was crucial to maintain the integrity of the tool in the context of cultural and linguistic differences. The second phase encompassed the psychometric evaluation of the Urdu version of the ABC scale within the elderly population. This assessment was vital to establish the tool's validity and reliability in measuring fear of falling and balance confidence among the targeted demographic.

Data collection was conducted through structured interviews and self-administered questionnaires. Participants were briefed about the study's purpose and procedures, and informed consent was obtained. The ethical dimensions of the study were rigorously adhered to, with approval secured from the appropriate ethics committees, ensuring compliance with standards of research integrity and participant confidentiality.

In terms of data analysis, the study employed the Statistical Package for the Social Sciences (SPSS) version 25. This analysis aimed to quantify the psychometric properties of the translated scale, including its internal consistency, test-retest reliability, and construct validity. Correlations with other established measures were also explored to provide a comprehensive understanding of the scale's effectiveness in the local context.

The study's approach was thorough and multi-faceted, allowing for an in-depth exploration of the translated ABC scale's applicability and relevance in assessing the psychological well-being of older adults in Pakistan. The selection of the sample size, the translation process, and the psychometric testing were all integral to achieving this goal.

RESULTS

Mean range of age and Body Mass Index of contestants in the chief study were 70.4 (60- 89) years, 23.65 ± 2.91 kg/m2 and in the psychometric study, mean range of age and Body Mass Index of contestants were 70.16 (59- 83) years, 23.63 ± 3.48 kg/m2, respectively. There demographics characteristics are briefly presented in Table 1.

Table 1: Demographic Characteristics

Variables	Main study(n=120)%	Psychometric study(n=60)%
Gender		
Male	80	43(86)
Female	40	17(34)
Age of subjects in years		
60-69(years)	48	28(56)
70-79(years)	54	25(50)
80-89(years)	18	7(14)
Occupationally active		
Yes	24	12(24)
No	66	38(76)
Retired	30	10(20)
Educational level		
Primary	46	21(42)
Matric	28	18(36)
Intermediate	33	14(28)
Graduate	13	7(14)
Use of Walking Aids		
Yes	26	11
No	94	49

Bland-Altman plot for Activities specific Balance Confidence Urdu version tool presented in Figure 1, this showed that whole data points were inside the 95 percent LOA. One out of 60 data points of the Activities specific Balance Confidence Urdu version tool whole score lay exterior. Scatter plot was designed for the preliminary and retest ABC-U total score. Perfect linear correlation was detected between them and value of r was 0.93.
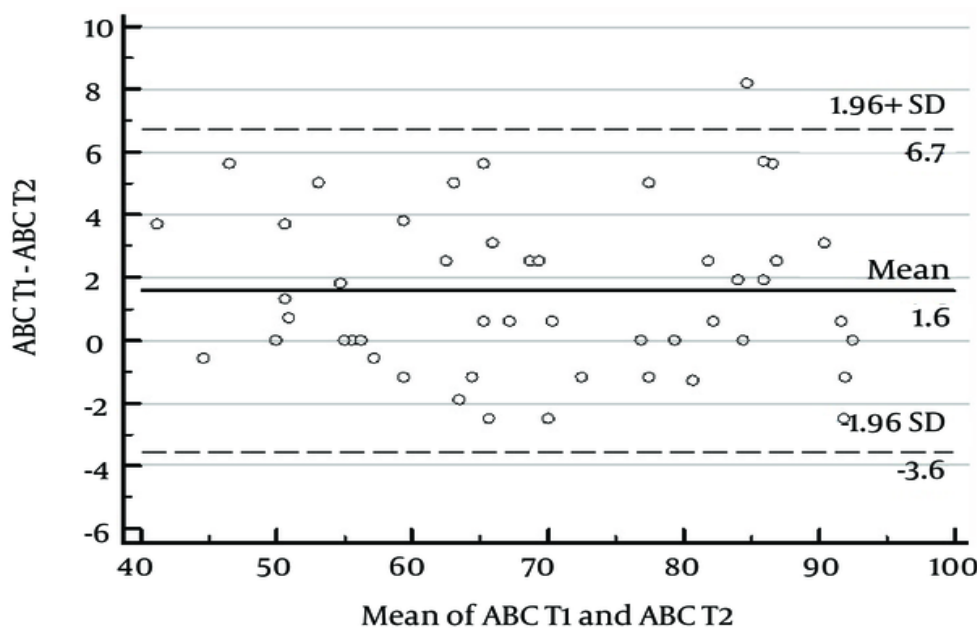
LOA Plot for Urdu Version of Activities-Specific Balance Confidence Scale (ABC-U) Variances among test scores on test and are designed in contradiction of separate entity's average for 2 tests. 95percemt LOA are showed by dotted lines. (± 1.96 standard deviations Along X and Y axis% of scores are mentioned.

Figure 1 LOA Plot for Urdu Version

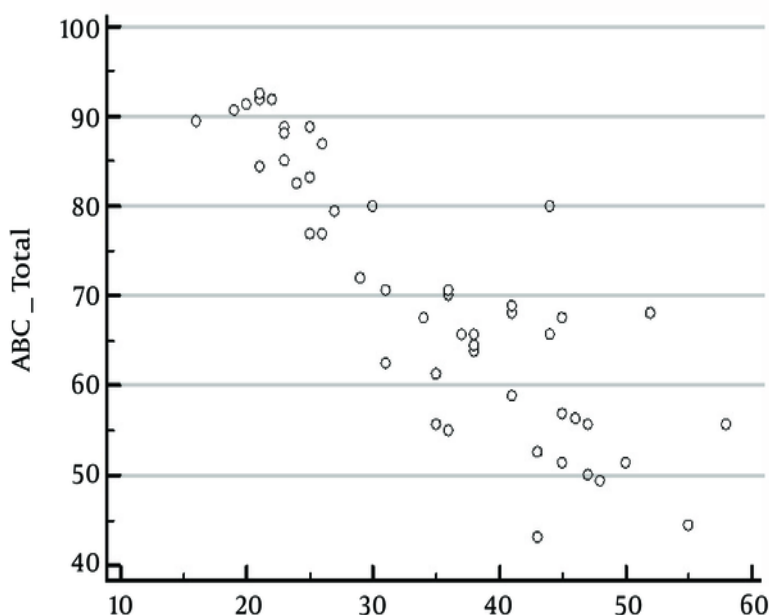*Figure 2 Scatter Plot Drawn Amid of ABC T1 and ABC T2 Full Scores*
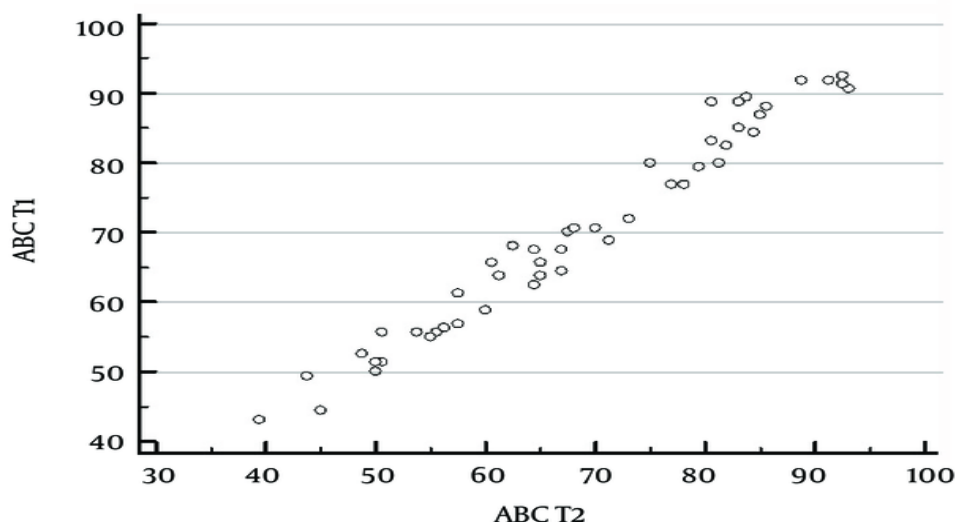
Flawless linear correlation between the initial and final score was shown by plot. Value of r is 0.93 and p value is less than 0.0001.

Validity

Pearson's correlation coefficient is used to determine concurrent validity. Negative correlation between Activities specific Balance Confidence Urdu and Fall Efficacy Scale international Urdu was present .Value of r was-0.80 and p value is less than 0.0001).

Figure 3 Scatter Plot Drawn Between total scores ABC-U and FES-I-U

Outstanding concurrent validity comes when negative relationship was shown by plot. Value of r is-0.80 and p value is less than 0.0001.

DISCUSSION

The Activities-specific Balance Confidence (ABC) scale, widely recognized for assessing fear of fall and balance issues in the elderly, has been successfully translated into Urdu in the current study. This adaptation also involved evaluating the psychometric properties of the Urdu version, providing normative data for self-perceived balance confidence scores in the Pakistani elderly population. The Urdu version of the ABC scale was deemed user-friendly and practical for application in clinical, academic, and hospital settings. The translation process adhered to the COSMIN guidelines, involving modifications to eight items primarily to align with common language use in Pakistan and to address cultural differences from Canada, where the original scale was developed (22-24).

In terms of reliability, the study focused on absolute reliability measured by the Standard Error of Measurement (SEM), essential for understanding day-to-day clinical applicability. The SEM value for the complete tool was 2.40, with individual components ranging from 3.55 to 11.2. This indicates a slightly higher SEM compared to a study by Nemmer et al. on older adults (SEM = 1.19) but lower than studies conducted on Parkinson's disease (SEM = 4.01) and stroke patients (SEM = 6.81) (25, 26, 35). These findings suggest that measurement error increases with the severity of the disease, aligning with studies on older adults and differing from those on diseased populations.

The Minimal Detectable Change (MDC), a measure of the smallest change in score perceptible by a person, was also calculated. The MDC95 for the full scale score was 6.4, with each component score ranging from 9.6 to 19. This was significantly lower than the MDC of 21.7 reported in the original Canadian study (5), and may be attributed to demographic differences or alterations in the targeted community (27, 28).

Concurrent validity, the degree to which a test corresponds to an external criterion, was strong. A notable negative relationship was observed between the Urdu versions of the ABC and the Fall Efficacy Scale International (FES-I), with a correlation coefficient of-0.80 (p < 0.0001). This inverse relationship between ABC-U and FES-I-U scores, where higher ABC-U scores indicate better confidence and higher FES-I-U scores suggest lower confidence, confirms excellent concurrent validity (29, 30).

The mean normative value of self-perceived balance confidence among participants was 70.5. This finding aligns with a previous Indian study (ABC score = 71) but shows variance from the Canadian (ABC score = 59.6 ± 17.7) and Brazilian (ABC score = 81.7 ± 10.1) populations (12, 24, 31). These differences could be attributed to variations in physical activity levels and the prevalence of walking aid use among these populations.

In conclusion, the Urdu version of the ABC scale has demonstrated reliability and validity in measuring fear of fall and assessing balance confidence among Urdu-speaking older adults. However, the study's reliance on convenience sampling and its limited geographical scope may affect the generalizability of the findings. Future research should aim to include a more diverse and representative sample and explore longitudinal data to better understand the scale's applicability over time. Additionally, the cultural nuances in the perception and reporting of balance confidence and fear of fall warrant further exploration to enhance the scale's cultural sensitivity and applicability in different regions.

CONCLUSION

In conclusion, the successful translation and validation of the Activities-specific Balance Confidence (ABC) scale into Urdu mark a significant advancement in geriatric care in Pakistan. This study demonstrates that the Urdu version of the ABC scale is a reliable and valid tool for assessing fear of falling and balance confidence among Urdu-speaking older adults. Its practical applicability in clinical, academic, and hospital settings makes it a valuable resource for healthcare professionals. The findings have important implications for fall prevention strategies, facilitating targeted interventions and enhancing the quality of life for the elderly population. However, the study's methodology, particularly its reliance on convenience sampling, suggests caution in generalizing the findings broadly. Future research should focus on diversifying the participant pool and examining longitudinal outcomes to further solidify the scale's utility and adaptability across different settings and populations. This research underscores the necessity of culturally and linguistically tailored assessment tools in addressing the unique healthcare needs of diverse aging populations.

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