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RELATIONSHIP BETWEEN BALANCE CONFIDENCE AND BALANCE PERFORMANCE IN MIDDLE-AGED VERSUS OLDER ADULTS

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ABSTRACT

Background: Balance confidence reflects an individual's self-perceived ability to maintain balance during daily activities, while balance performance represents actual postural control and functional stability. In middle-aged and older adults, age-related sensory, neuromuscular, and cognitive changes can negatively affect both balance confidence and balance performance, increasing the risk of falls and functional dependence. Understanding the relationship between these two components and comparing the age factor is essential for effective assessment and rehabilitation planning.
Objective: To determine the relationship between balance confidence and balance performance in middle-aged and older adults. Methods: An observational cross-sectional study was carried out among 68 middle-aged adults and 61 older adults of both genders. Balance confidence was assessed using Activities-Specific Balance Confidence (ABC) scale and balance performance was assessed using Berg Balance Scale (BBS). Participants were assessed under standardized conditions.
Results: Pearson correlation analysis was performed for this study. A very strong positive correlation (r=0.8) was found between balance confidence and balance performance in middle-aged adults whereas a moderate to strong positive correlation (r=0.5) was found between balance confidence and balance performance in older adults. This means that balance confidence and performance increases simultaneously but the value of correlation between them reduces as age increases. The study was found to be highly significant with $p<0.001$.
Conclusion: The study concludes that both balance confidence and balance performance have significant positive correlation in middle-aged and older adults. As age increases balance confidence and performance reduces and this may negatively impact functional balance and increase fall risk. Therefore, comparing middle-aged and older adults is essential to identify early age-related changes in balance confidence and performance, enabling timely preventive strategies and age-specific rehabilitation planning.
Keywords: balance confidence, balance performance, middle-aged adults, older adults, fall risks

INTRODUCTION

Balance is a crucial aspect of human movement, and it encompasses the ability to change from stationary positions to movement transitions while maintaining postural stability.[1] Balance confidence is the perceived ability of an individual to maintain stability while performing various activities.[2] Balance control is recognized to be a function of the integration of various systems, such as visual, somatosensory, and vestibular inputs, as well as mechanical aspects such as the base of support (BOS), which is defined as the area bounded by the feet.[2] As the average life expectancy increases, the preservation and promotion of balance have become more important from a societal viewpoint, especially in the aging population.[2] As life expectancy

increases, balance maintenance has become crucial for functional independence and fall prevention. Balance confidence, a psychological aspect of balance, affects how people perceive and execute daily tasks, but it is commonly neglected during the course of regular assessment. Although the performance of balance has been extensively investigated in older people, few studies have explored the relationship between balance confidence and objective balance performance in different age groups, especially among middle-aged people.

Investigating balance confidence together with balance performance may help in developing age-specific assessment approaches and inform preventive and targeted physiotherapy interventions to prevent falls and functional impairment. In middle-aged and older people, the effects of aging can adversely influence balance confidence and balance performance, resulting in increased risks of falls and functional dependency. It is important to comprehend the relationship between the two aspects and compare the factor of age to ensure effective assessment and rehabilitation. The objective of this research is to establish the relationship between balance confidence and balance performance and compare the relationship between middle-aged and older people.

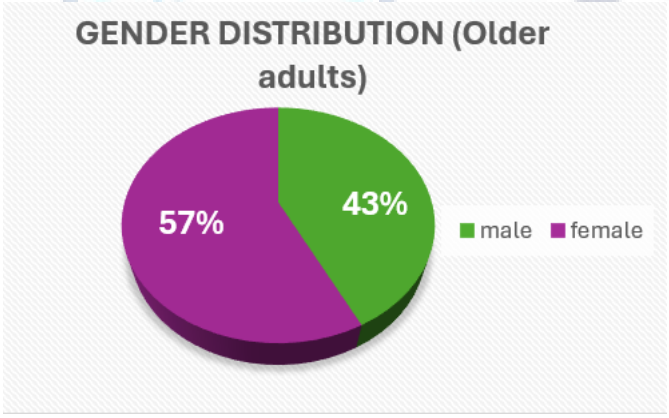
METHODOLOGY

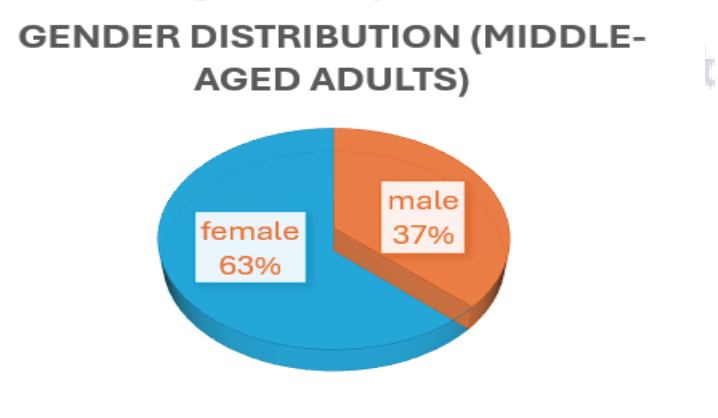
Study Design: It is an observational cross-sectional study.
Participants: Participants included middle-aged and older adults of both genders. 68 middle-aged adults [n=68]. 61 older adults [n=61]. The inclusion criteria included:

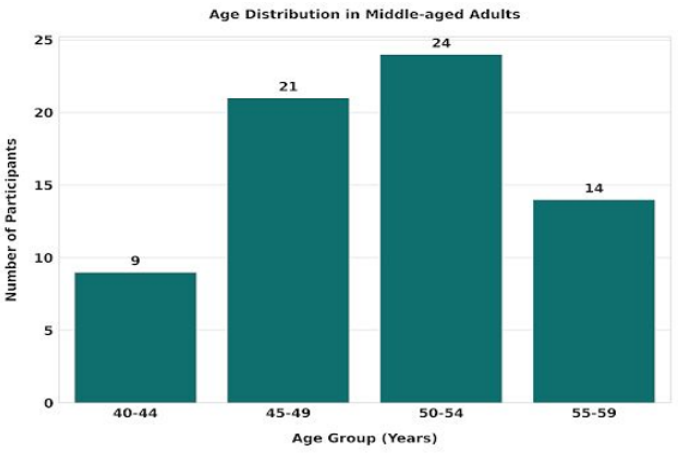
- Adults aged 40 years and above.[4]
- Independent ambulation.[4]
- Ability to follow verbal instructions.[5]

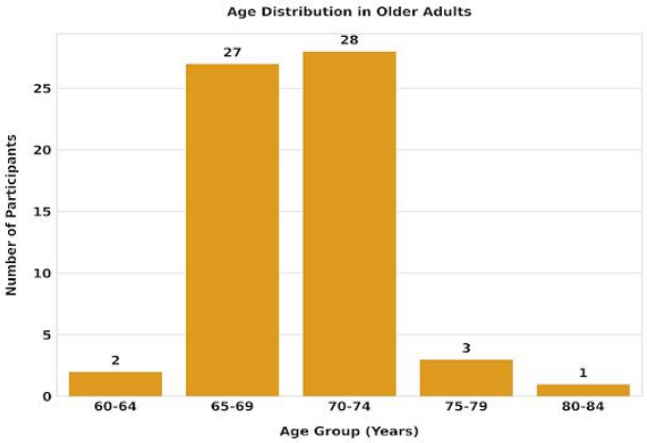
The exclusion criteria included:

- Any neurological disorders.[4]
- Cognitive dysfunction.[3]
- Vestibular dysfunction.[3]
- Recent surgery.[5]
- Severe musculoskeletal disorders.[5]









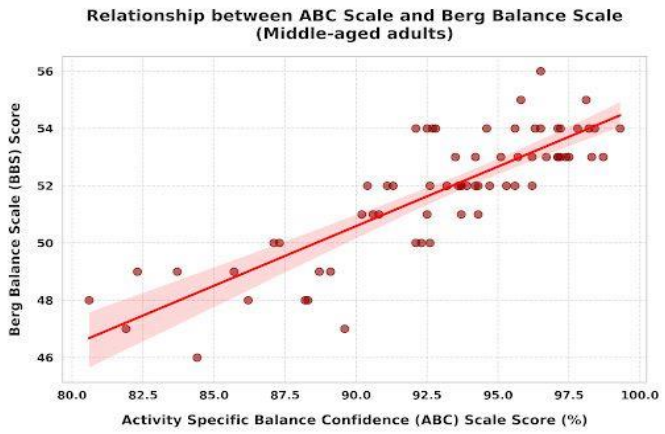
Intervention/Procedure: Participants fulfilling the inclusion and exclusion criteria and willing to participate were included in the study. Participants assessed under standardized conditions. Balance confidence was assessed using Activities-Specific Balance Confidence (ABC) scale and balance performance was assessed using Berg Balance Scale (BBS). [1][2]

Outcome Measures: Balance confidence was assessed using the **Activities-Specific Balance Confidence (ABC) Scale**, a self-reported questionnaire that measures an individual's perceived confidence. It includes asking the individuals to rate 16 common daily activities they perform without losing balance. Each activity is rated on a scale from 0% (no confidence) to 100% (complete confidence), with higher scores meaning greater balance confidence.[2] The ABC scale is widely used, reliable, and valid for assessing balance confidence in middle-aged and older adults.[2] Balance performance was measured using the **Berg Balance Scale (BBS)**, a performance-based outcome measure consisting of 14 functional balance tasks, including sitting, standing, transfers, reaching, and turning. Each item is scored from 0 to 4, with a maximum total score of 56.[1] Higher scores indicate better balance performance and lower risk of falls. The BBS is a well-established and standard tool commonly used in clinical and research settings to assess functional balance in adults and older populations.[1]

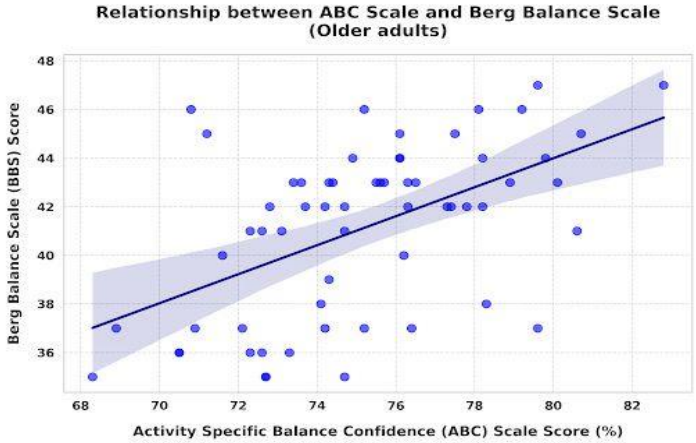
Statistical Analysis: Excel was used for the statistical analysis of this study. Pearson's correlation analysis was used to analyze the relationship between ABC Scale and Berg Balance Scale. Statistical significance was set at $p<0.05$.

RESULTS

Pearson correlation analysis was performed for this study. For Middle-aged Adults very strong positive correlation was seen between balance confidence and performance. Correlation coefficient for middle-aged adults was found to be $r = 0.8$. For Older Adults moderate to strong positive correlation seen between balance confidence and performance. Correlation coefficient for older adults was found to be $r = 0.5$. The study was found to be significant $p<0.001$. Significant positive correlation observed in both age groups. Correlation strength reduces with increasing age. The graph 1 shows a positive linear relationship between ABC scale scores and Berg Balance Scale scores in middle-aged adults. As balance confidence increases, balance performance also improves. This indicates that individuals with higher confidence in their balance tend to demonstrate better objective balance ability. The graph 2 shows a positive relationship between ABC scale scores and Berg Balance Scale scores in older adults. As balance confidence increases, balance performance improves. However, the wider spread of data points suggests greater variability in balance performance among older adults compared to middle-aged adults, indicating that factors other than confidence may also influence balance in this age group.



Graph 1: Correlation between ABC Scale and Berg Balance Scale (Middle-aged adults)



Graph 2: Correlation between ABC Scale and Berg Balance Scale (Older adults)

DISCUSSION

This study showed a significant positive relationship between balance confidence and balance performance in both middle-aged and older adults, with a stronger correlation seen in the middle-aged group as compared to the older group. This suggests that individuals with higher perceived balance confidence tend to show better objective balance ability, while the weakening of this relationship with increasing age may be due to age-related factors such as sensory, neuromuscular, and cognitive changes influencing balance beyond confidence alone. These findings are consistent with previous studies that have reported a positive association between balance confidence and balance performance in older adults, supporting the role of psychological factors in balance control.[6] However, the reduced correlation in older adults aligns with existing literature suggesting greater variability and the influence of additional factors such as comorbidities and physical decline.[7] The cross-sectional design and reliance on self-reported confidence measures limit causal interpretation, also the study did not account for other contributors such as fear of falling or physical activity levels. Clinically, the findings emphasize the importance of incorporating both subjective and objective balance assessments in routine evaluation and highlight the potential value of early, confidence-focused interventions in middle-aged adults to prevent future balance impairments and reduce fall risk.

CONCLUSION

This study found that balance confidence and balance performance are positively related in middle-aged and older adults, with a stronger positive relationship found in middle-aged adults and a progressive decline of this relationship with increasing age. The implications of these findings are that both the psychological and physical aspects of balance need to be taken into account when balance is assessed. In terms of practical application, the use of balance confidence measures in addition to performance-based measures could improve the early detection of those at risk of balance dysfunction and falling. The findings of this study support the inclusion of confidence-boosting strategies as part of physiotherapy-based rehabilitation programs to improve functional outcomes. Future studies should examine the use of longitudinal designs to establish causality and examine the role of other variables, including fear of falling, physical activity levels, and comorbidities, and assess the efficacy of interventions designed to boost balance confidence in different age groups.

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