"It was probably because of lockdown that I fell": Older adults' experiences of independent living in relation to stair falls

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Introduction

In the United Kingdom (UK), stair falls in older adults home's result in over 57,000 attending Accident and Emergency departments annually and nearly 1,000 deaths as a consequence [1]. These falls cost the NHS £435 million due to unaddressed hazards [2]. Such hazards may include poorly designed/absent handrails, too steep/narrow staircases, poor step surface (e.g., loose carpets), and poor lighting. Additionally, previous findings from a survey we conducted discovered an increase in home stair falls during COVID-19 lockdowns. Given the UK's aging population increasing and outdated housing stock, understanding staircase conditions and stair-related accidents during the pandemic is crucial for enhancing older adults' independence and quality of life [3,4].

Research Question

The study aimed to understand older adults' experiences of independent living and falls on their domestic staircases during COVID-19, and shed light on older adults' physical staircase dimensions that influence stair fall risks in relation to UK government guidelines.

Methods

A mixed-methods approach was employed, conducting inductive thematic analysis of qualitative semi-structured interviews with 22 participants aged ≥ 60 years alongside quantitative assessments of stair safety features within the participants homes. The home stair assessment captured the physical dimensions (i.e. measurements of pitch, rise and going) of their home staircase, and if they perceived their stairs safe to negotiate.

Results

We identified four overarching themes common across older people living independently: Effects of Lockdown on Daily Living during the COVID-19 Pandemic; Stair-related accidents and perceived causes; Fall preventative measures and safety awareness; and Attitudes towards ageing and care Services. Experiencing a stair fall in their homes during COVID-19 had considerable impact on participants well-being, with consequences such as broken bones, discomfort, social isolation, and feeling fearful navigating their home stairs. However, participants revealed strong emotional attachments to their homes and preference for ageing in place. Despite that 100% of the participants perceived their stairs to be safe to negotiate, many lacked safety measures, with nearly half of participants' staircases (40%) not meeting the UK government guidelines. This poses a challenge to the desire for prolonged independent living and preventing stair falls.

Discussion

The study informs the connection between older adults' independent living experiences, staircase conditions, and the risk of stair falls during COVID-19. Despite participants' emotional attachment to their homes, many lacked staircases that meet UK government guidelines, highlighting a need for targeted interventions to mitigate environmental hazards and promote safety awareness. Additionally, financial constraints further complicate efforts to enhance home safety. Discrepancies between perceived and objective safety assessments highlight the need for comprehensive care approaches and evidence-based home design guidelines, allowing for collaborative support for ageing in place. Bridging this gap is essential for fostering safe environment's and reducing home stair falls among older adults.

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Execution types and correlates of frontal knee angle in healthy adults performing split lunges

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Introduction

Split lunge (SL) is a common functional exercise. To date, SL has been studied primarily in the context of the observational Functional Movement Screening Test [1]. Only two studies have used 3D motion capture to assess this highly demanding task: one in conditions of ankle instability [2], and a second focused on the effects of weight positioning during training [3]. However, knowledge on performance characteristics is missing. Previous studies on partially similar tasks differ from ours in terms of smaller sample size [4, 5], non-consideration of the role of gender [6], or the role of health status and exercise proficiency on execution quality [4].

Research Question

What are SL execution types and their correlates of frontal knee angle (fKA) in healthy adults?

Methods

Thirty-nine (19 female / 20 male) healthy exercise proficient (n = 19) and non-proficient (n = 20) participants aged 19 to 62 (32 ± 10.5) years with BMI 18.5 to 30.39 (23.7 ± 2.6) kg/m2 performed five SL with their dominant leg in front position. Data were captured using a 3D-markerbased movement analysis system with the modified Cleveland Clinical Markerset and one force plate. Processed trials were time-normalized for the down-phase. Difference in fKA at maximum knee flexion was tested between exercise proficient and non-proficient participants using Mann-Whitney-U-Test, due to violated normality assumption. Further, hierarchical cluster analysis was used to identify fKA execution types concerning functional leg alignment. Associations of these cluster allocations with sex, BMI, proficiency, and age were assessed by cross-tabulation and Spearman's correlation.

Results

fKA ranges from -10.2 to 7.3° (median 0.3) for exercise proficient and from -7.6 to 7.0 (median 2.9) for non-proficient (r = 0.31, p = 0.057) participants (Figure 1a). In the total sample, two main clusters and one cluster based on one person were identified. Cluster 1 (13 proficient and 16 non-proficient) is characterised by a median fKA of 2.68° (min -1.56; max 7.33), Cluster 2 (5 proficient and 4 non-proficient) by -6.35° (-7.63; -3.04), and Cluster 3 (1 proficient) by -10.23° (Figure 1 c,d). Thus, cluster 1 represents a neutral to varus SL execution, whereas clusters 2 and 3 represent a valgus SL execution type. Cluster allocation was significantly associated with sex (Cramer´s V = 0.46, p = 0.02) and BMI (Rho = -0.32, p = 0.04), but not with proficiency (Cramer´s V = 0.19, p = 0.50) and age (Rho = 0.10, p = 0.53).

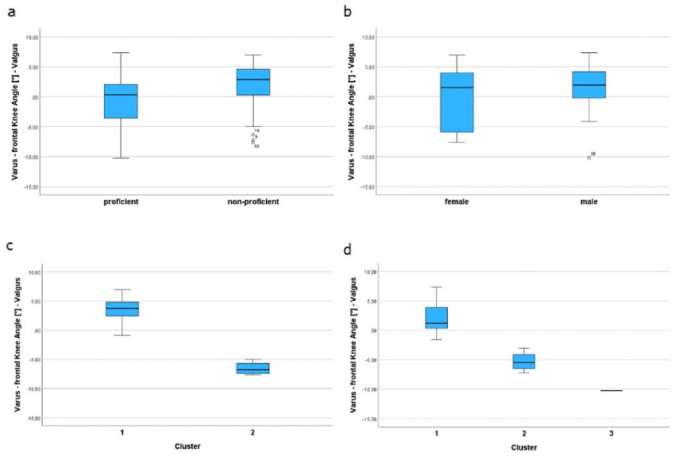

Figure 1: Median with 95% CI and outliers of frontal knee angle [degree]
a...proficiency; b...sex; c...non-proficient by clusters; d...proficient by clusters

Discussion

These results suggest that exercise proficiency and age may not be associated with SL execution types. Additional factors such as physical activity level or neuromuscular control could be considered in this context. Our findings are consistent with the existing research, that women are at higher risk for dynamic leg alignment valgus (Figure 1b) [7]. Clustering revealed a clear distinction between fKA types. Parameters other than fKA, which are not yet established, may be more sensitive to characterize functional leg alignment.

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Selective dorsal rhizotomy reduces stretch hyperreflexia and possibly muscle tone in children with spastic cerebral palsy

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Introduction

Selective dorsal rhizotomy (SDR) is applied in ambulant children with spastic cerebral palsy (CP) in order to normalize the neural response to stretch[1]. SDR is a neurosurgical procedure where dorsal nerves of the spine are selectively cut to decrease sensory excitation