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PREVALENCE OF KINESIOPHOBIA IN COMMUNITY-DWELLING OLDER ADULTS

An Observational Cross-Sectional Study from Pune, India

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Abstract : *Background: Later life is marked by declining strength, balance and mobility, and many older people become anxious about moving. Kinesiophobia, an exaggerated fear of movement driven by the expectation of pain or injury, can lead to inactivity and deconditioning, yet it has seldom been studied in independently living older people in India. This study estimated its prevalence in community-dwelling older adults and tested whether it is associated with fear of falling. Methods: A cross-sectional observational study was carried out on 174 community-dwelling adults aged 65 years and above, recruited by purposive sampling from housing societies, senior citizen groups and community centres in Pune. Kinesiophobia was measured with the Tampa Scale for Kinesiophobia (TSK; score above 37 = high) and fear of falling with the Falls Efficacy Scale–International (FES-I). Data were analysed in SPSS version 26.0 at a significance level of $p < 0.05$. Results: The sample had 87 men and 87 women (mean age 75.16 ± 6.37 years). Mean TSK and FES-I scores were 43.00 ± 9.98 and 40.77 ± 9.68. High kinesiophobia was present in 123 participants (70.7%; 95% CI 63.5–76.9%) and high concern about falling in 157 (90.2%; 95% CI 84.9–93.8%). TSK and FES-I scores were moderately and positively correlated (Spearman $\rho = 0.542$, $p < 0.001$), and participants with high kinesiophobia had 7.26 times the odds of high concern about falling (95% CI 2.41–21.91). Neither gender nor age group differed significantly in either score. Conclusion: Fear of movement and fear of falling are both widespread among community-dwelling older adults and are significantly associated, although the two are not interchangeable. Both should be screened for during geriatric physiotherapy assessment and addressed through education, graded exposure, strengthening and balance training.*

IndexTerms *- Kinesiophobia, community-dwelling older adults, fear of falling, Tampa Scale for Kinesiophobia, Falls Efficacy Scale–International, physiotherapy, ageing.*

I. INTRODUCTION

Later life brings a gradual loss of muscle strength, joint mobility, sensation and postural control, together with changes in social roles, finances and emotional wellbeing. One of the concerns older people voice most often is uncertainty about moving around safely. When that uncertainty makes a person do less, the resulting weakness and poorer balance can raise, rather than lower, the chance of falling [1, 2].

Kinesiophobia is an exaggerated and irrational fear of physical movement that arises from a feeling of being vulnerable to painful injury or re-injury [3]. The fear-avoidance model describes how it develops: a catastrophic interpretation of pain produces fear, fear leads to hypervigilance and avoidance, and avoidance results in disuse, disability and further pain [4, 5]. The concept was built around chronic musculoskeletal pain, but recent work suggests that it is also common in old age; in a survey of 302 adults over 65 years in Türkiye, high kinesiophobia was found in 92.7% [6].

Fear of falling has been investigated far more extensively. Published estimates for community-dwelling older persons range from 3% to 85%, depending on how the fear is measured [2]. By comparison, little is known about how common kinesiophobia is among older people who live independently in the community, or how it relates to fear of falling, and Indian data are especially scarce. If fear of movement leads to restricted activity, a cycle of deconditioning, poorer balance and greater fall risk may follow, threatening independence and quality of life. Knowing the size of the problem can support early screening and targeted physiotherapy aimed at safe mobility and confidence in movement.

This study therefore aimed to determine the prevalence of kinesiophobia in community-dwelling older adults and to examine its association with fear of falling. The objectives were to assess kinesiophobia with the Tampa Scale for Kinesiophobia (TSK), to assess fear of falling with the Falls Efficacy Scale–International (FES-I), to estimate the prevalence of high kinesiophobia, and to test the association between the two. The null hypothesis stated that there is no significant association between kinesiophobia and fear of falling; the alternative hypothesis stated that a significant association exists.

II. REVIEW OF LITERATURE

Evidence on kinesiophobia in older people comes mostly from clinical or institutional groups. Genç and Bilgili reported that 92.7% of 302 adults aged over 65 had high levels of kinesiophobic attitude; most attributed it to psychological causes, and it was positively related to frailty [6]. In a Swedish sample of 433 older adults with chronic pain, Larsson et al. observed a low mean score on the 11-item version of the scale, with roughly one in ten participants above the threshold; pain intensity and poor self-perceived health were the strongest correlates [7]. In older patients with chronic low back pain and osteoporosis, higher kinesiophobia was linked to weaker functional balance, narrower limits of stability and slower Timed Up and Go performance [8].

Research on fear of falling is broader. A systematic review found that the fear is common even in older people who have not fallen and that it can lead to activity restriction, lower quality of life and institutionalisation [2]. In 867 older residents of care facilities in Hyderabad, 56.1% reported fear of falling on the short FES-I, and depression was among its strongest correlates [9]. In

a prospective cohort, activity restriction caused by fear of falling was followed by a decline in physical function [1]. Only a few studies have set the two fears side by side: among 163 nursing-home residents with chronic pain, kinesiophobia and fear of falling were weakly correlated (r = 0.259) [10]. To our knowledge, no study has examined this relationship in community-dwelling older adults in India, which is the gap addressed here.

III. RESEARCH METHODOLOGY

3.1 Study design and setting

An observational cross-sectional design was used. Data were collected over six months in community settings within Pune city, namely residential housing societies, senior citizen groups, community centres and local public areas.

3.2 Participants

A total of 174 older adults were recruited by purposive sampling. Men and women aged 65 years or above who lived in the community, were mentally alert, could follow instructions and gave informed consent were eligible. People with cognitive impairment, severe neurological or psychiatric disorders, or an acute illness or injury restricting physical activity were excluded, as were those unwilling to take part.

3.3 Outcome measures

Kinesiophobia was measured with the 17-item Tampa Scale for Kinesiophobia (TSK), whose total score ranges from 17 to 68; a score above 37 denoted high kinesiophobia [3]. Fear of falling was measured with the 16-item Falls Efficacy Scale–International (FES-I), with totals from 16 to 64, interpreted as low (16–19), moderate (20–27) or high (28–64) concern about falling [11, 12]. Reliability and validity coefficients adopted for the instruments were 0.646 and 0.75 for the TSK and 0.94 and 0.78 for the FES-I.

3.4 Procedure

Permission to conduct the study was obtained from TMV's Jayantrao Tilak College of Physiotherapy. Eligible older adults were approached at the study sites, the purpose of the study was explained, and written informed consent was obtained. Demographic details were recorded on a data collection sheet, after which each participant completed the TSK and FES-I.

3.5 Statistical analysis

Data were entered in Microsoft Excel and analysed with SPSS version 26.0. Age, TSK and FES-I scores were summarised as mean, standard deviation, 95% confidence interval, median, interquartile range and range, and categorical variables as frequencies and percentages. Prevalence was reported with 95% confidence intervals using the Wilson score method. The Shapiro–Wilk test checked normality. Because TSK scores were not normally distributed ($p = 0.014$) while FES-I scores were ($p = 0.104$), Spearman's rank correlation was used to relate the two scales. The chi-square test was applied to the two score categories, with Fisher's exact test reported because one expected cell count was below 5. The Mann–Whitney U and Kruskal–Wallis tests were used for TSK, and the independent t-test and one-way ANOVA for FES-I, to compare gender and age groups. Significance was set at $p < 0.05$.

IV. RESULTS AND DISCUSSION

4.1 Participant characteristics

All 174 participants were analysed; men and women were equally represented (87 each). Ages ranged from 65 to 85 years with a mean of 75.16 ± 6.37 years, and the 80–85 year band was the largest (n = 54, 31.0%). The mean TSK score (43.00 ± 9.98) lay above the cut-off of 37, and the mean FES-I score (40.77 ± 9.68) fell in the high-concern range (Tables 1 and 2).

Table 1: descriptive statistics of age, TSK and FES-I scores (N = 174)

Variable	Mean ± SD	95% CI	Median (IQR)	Range
Age (years)	75.16 ± 6.37	74.20 – 76.11	75 (69 – 81)	65 – 85
TSK total score	43.00 ± 9.98	41.51 – 44.49	43 (35.25 – 51)	20 – 62
FES-I total score	40.77 ± 9.68	39.32 – 42.22	40.5 (33.25 – 48.75)	19 – 62

SD = standard deviation; CI = confidence interval; IQR = interquartile range; TSK = Tampa Scale for Kinesiophobia; FES-I = Falls Efficacy Scale–International.

Table 2: distribution of participants by gender, age group, kinesiophobia category and fear-of-falling category

Category	Frequency (n)	Percentage (%)
Male	87	50.0
Female	87	50.0
65–69 years	47	27.0
70–74 years	35	20.1
75–79 years	38	21.8
80–85 years	54	31.0
Low kinesiophobia (TSK ≤ 37)	51	29.3
High kinesiophobia (TSK > 37)	123	70.7
Low concern about falling (FES-I 16–19)	0	0.0
Moderate concern (FES-I 20–27)	17	9.8
High concern (FES-I 28–64)	157	90.2

Percentages are of the total sample (N = 174).

4.2 Prevalence

High kinesiophobia was found in 123 participants (70.7%; 95% CI 63.5–76.9%) and high concern about falling in 157 (90.2%; 95% CI 84.9–93.8%). None of the participants fell in the low-concern category. The prevalence of high kinesiophobia was almost identical in men (71.3%) and women (70.1%; $\chi^2 = 0.028$, $p = 0.868$). It was highest in the 75–79 year group (86.8%) and lowest in the 80–85 year group (63.0%), but the difference across age groups was not significant ($\chi^2 = 7.63$, $p = 0.054$) (Table 3, Figs. 1 and 2).

Table 3: prevalence of high kinesiophobia and high concern about falling

Outcome / subgroup	n / N	Prevalence (%)	95% CI (%)	Chi-square test
High kinesiophobia (overall)	123/174	70.7	63.5 – 76.9	—
High concern about falling (overall)	157/174	90.2	84.9 – 93.8	—
High kinesiophobia: male	62/87	71.3	61.0 – 79.7	$\chi^2 = 0.028$; $p = 0.868$
High kinesiophobia: female	61/87	70.1	59.8 – 78.7	
65–69 years	30/47	63.8	49.5 – 76.0	$\chi^2 = 7.63$; $p = 0.054$
70–74 years	26/35	74.3	57.9 – 85.8	
75–79 years	33/38	86.8	72.7 – 94.2	
80–85 years	34/54	63.0	49.6 – 74.6	

CI = confidence interval (Wilson score method); χ^2 for gender df = 1 and for age group df = 3.

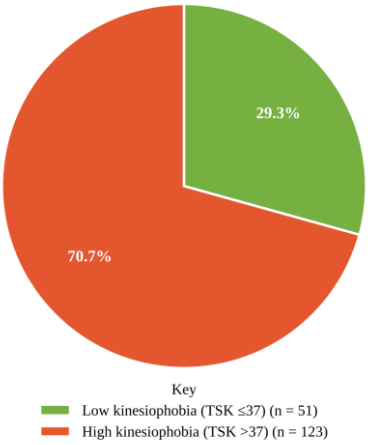

Fig. 1: distribution of participants by kinesiophobia category

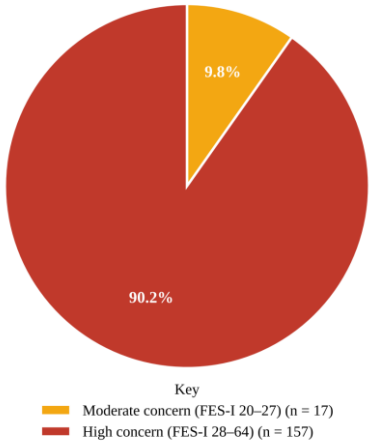

Fig. 2: distribution of participants by fear-of-falling category

4.3 Association between kinesiophobia and fear of falling

Age ($p < 0.001$) and TSK scores ($p = 0.014$) departed from normality, whereas FES-I scores did not ($p = 0.104$), so rank correlation was applied. TSK and FES-I scores showed a significant, moderate positive correlation ($\rho = 0.542$, $p < 0.001$); age was unrelated to either score (Table 4).

Table 4: Spearman's rank correlations of TSK, FES-I and age

Variables	Spearman ρ	p value	Interpretation
TSK score vs FES-I score	0.542	< 0.001	Moderate positive, significant
Age vs TSK score	−0.065	0.395	Negligible, not significant
Age vs FES-I score	−0.006	0.932	Negligible, not significant

ρ: 0.2–0.39 weak, 0.4–0.69 moderate, ≥ 0.7 strong; $p < 0.05$ considered significant.

Among participants with high kinesiophobia, 95.9% had high concern about falling, against 76.5% of those with low kinesiophobia (Table 5; Fisher's exact $p < 0.001$). The odds of high concern about falling were 7.26 times greater in the high-kinesiophobia group (95% CI 2.41–21.91; Cramér's V = 0.30). Mean FES-I scores were also higher in the high-kinesiophobia group (43.63 ± 8.85) than in the low-kinesiophobia group (33.88 ± 8.02), a difference of 9.74 points ($t(172) = 6.79$, $p < 0.001$; Cohen's d = 1.13, a large effect) (Figs. 3 and 4). The null hypothesis was therefore rejected.

Table 5: kinesiophobia category by fear-of-falling category

Kinesiophobia category	Moderate concern, n (%)	High concern, n (%)	Total, n
Low kinesiophobia	12 (23.5)	39 (76.5)	51
High kinesiophobia	5 (4.1)	118 (95.9)	123
Total	17 (9.8)	157 (90.2)	174
$\chi^2 = 15.49$, df = 1, $p < 0.001$; Fisher's exact $p < 0.001$; OR = 7.26 (95% CI 2.41 – 21.91); Cramér's V = 0.30			

Percentages are row percentages; OR = odds ratio of high concern about falling in high versus low kinesiophobia.

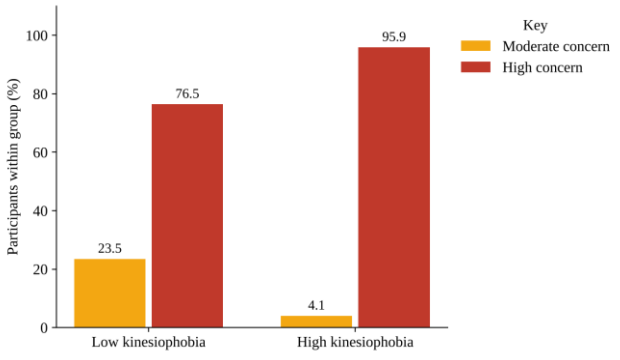

Fig. 3: fear-of-falling category within each kinesiophobia category (%)

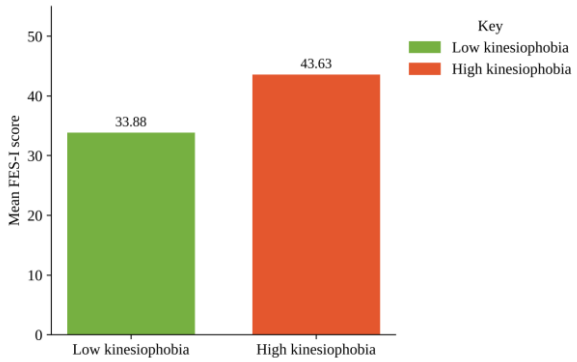

Fig. 4: mean FES-I score in low and high kinesiophobia groups

4.4 Comparison by gender and age group

Men and women did not differ in TSK scores (Mann–Whitney U = 4039, p = 0.444) or FES-I scores (Welch's t = 1.26, p = 0.211). Likewise, neither TSK (Kruskal–Wallis H = 3.84, p = 0.279) nor FES-I scores (ANOVA F = 2.25, p = 0.084) differed across the four age groups (Tables 6 and 7).

Table 6: comparison of TSK and FES-I scores by gender

Outcome	Male (n = 87)	Female (n = 87)	Test	p value
TSK, median (IQR)	43 (36.5 – 52.5)	41 (34 – 51)	Mann–Whitney U = 4039	0.444
FES-I, mean ± SD	41.69 ± 8.46	39.85 ± 10.73	Welch's t = 1.26	0.211

Table 7: comparison of TSK and FES-I scores by age group

Age group (years)	n	TSK, median (IQR)	FES-I, mean ± SD
65–69	47	43 (35 – 51.5)	39.47 ± 8.85
70–74	35	46 (36 – 51)	41.20 ± 11.79
75–79	38	44 (39.25 – 52)	44.08 ± 9.12
80–85	54	39.5 (33.25 – 49.5)	39.30 ± 8.88
Test		Kruskal–Wallis H = 3.84, p = 0.279	ANOVA F = 2.25, p = 0.084

4.5 Discussion

In this sample of independently living older adults in Pune, seven in ten showed high kinesiophobia and nine in ten were highly concerned about falling, and the two were significantly and moderately correlated. The mean TSK score of 43.00 suggests that fear of movement is not confined to clinical pain populations, in line with the fear-avoidance model, in which threatening interpretations of bodily experience lead to avoidance, disuse and disability [4, 5].

The prevalence of 70.7% is high but below the 92.7% found by Genç and Bilgili [6] and far above the roughly 10% reported by Larsson et al. [7]. Such wide variation is likely to reflect differences in the questionnaire version and cut-off, the sampling frame and the cultural setting. The Swedish participants were drawn at random from a national register, whereas the present participants were recruited purposively through societies, clubs and centres, which may have favoured people more aware of their physical limits. Physical decline, degenerative joint disease that makes stairs, squatting or rising from the floor effortful, and cultural beliefs that old age is a time for rest or that elders should be shielded from exertion may all strengthen the belief that movement is unsafe. In earlier work, psychological factors, pain intensity and self-perceived health were the main correlates of kinesiophobia [6, 7].

The high level of concern about falling (90.2%, with no participant in the low category) exceeds the 56.1% reported among older residents of Indian care homes with the short FES-I [9] and sits within the wide international range described by Scheffer et al. [2]. The full 16-item FES-I used here covers demanding outdoor and social activities such as walking on slippery or uneven ground, on slopes and in crowds [11, 12]. Uneven footpaths, heavy traffic, crowded markets, steep stairs without handrails and wet bathroom floors are everyday features of urban Indian life, and these demands are likely to heighten concern even in functionally independent older people.

The central finding, a moderate positive correlation (ρ = 0.542) with a 7.26-fold increase in odds, is stronger than the weak correlation (r = 0.259) reported by Sertel et al. in nursing-home residents with chronic pain [10]. Because our participants were not selected for pain, their fear of movement may rest less on pain and more on a general expectation of bodily harm, which overlaps closely with concern about falling. The fear-avoidance model offers a mechanism: avoidance causes loss of strength, endurance and balance, which makes everyday tasks less secure and lowers confidence about staying upright [5]. Consistent with this, kinesiophobia has been linked to poorer functional balance and limits of stability [8], and fear-induced activity restriction has been followed by declining physical function [1]. The two fears therefore appear to reinforce one another in a cycle of fear, avoidance, deconditioning, impaired balance and further fear.

The constructs are nevertheless distinct: 76.5% of participants with low kinesiophobia still had high concern about falling. Kinesiophobia centres on expected pain or injury during movement, whereas concern about falling also reflects confidence in balance, awareness of environmental hazards and the feared consequences of a fall, such as fracture, hospital admission, dependence or becoming a burden [2]. In Indian families, where older adults often rely on their children, these consequences may carry particular

weight. Shared psychological tendencies, including low self-efficacy, anxiety and low mood [7, 9], may further explain why many participants scored high on both scales.

Neither gender nor age group made a significant difference. The literature on gender is inconsistent: kinesiophobia was more frequent in men with chronic musculoskeletal pain [13], but unrelated to sex in older adults [7], while female gender was a risk factor for fear of falling in one review [2] but not in an Indian study [9]. The equal numbers of men and women, their near-identical mean ages, and similar urban living conditions may account for the absence of a difference. The lack of an age effect ($p = 0.054$ for prevalence across age groups) may reflect the narrow 65–85 year range and a healthy-participant effect, since the oldest people who remain independent, cognitively intact and willing to take part are probably the more robust of their age group. This suggests that how a person appraises movement, rather than chronological age itself, shapes kinesiophobia in this population.

4.6 Clinical implications

Because seven in ten participants had high kinesiophobia and most of them also had high concern about falling, brief screening with the TSK and FES-I deserves a place in geriatric assessment, even for older adults who are independent and appear free of disability. Fall-prevention programmes built only on strength and balance training may fall short if fear of movement goes unaddressed, since a fearful person is less likely to start or continue exercising. Rehabilitation should combine progressive strengthening, balance and gait training with education on the safety and benefits of movement, graded exposure to feared activities and confidence-building, within a biopsychosocial approach [4, 5].

4.7 Limitations and future scope

The cross-sectional design prevents conclusions about cause and effect, and purposive sampling within Pune limits generalisability to other regions and to rural older adults. Both constructs were measured by self-report only, without objective tests of balance, mobility or physical activity, and falls history, pain intensity, comorbidities, assistive-device use, depression and anxiety were not recorded. The small number of participants with moderate concern and the absence of any with low concern restricted comparison across all fear-of-falling categories. Future work could use longitudinal designs to test whether kinesiophobia predicts later falls and functional decline; recruit larger, randomly sampled, multicentre groups including rural and institutionalised older adults; add objective measures such as the Berg Balance Scale and Timed Up and Go test together with pain, frailty and psychological variables; evaluate interventions based on graded exposure, education and exercise; and translate and validate the TSK in Marathi and Hindi.

V. CONCLUSION

Kinesiophobia is highly prevalent among community-dwelling older adults in Pune, affecting 70.7% of participants, and 90.2% were highly concerned about falling. The two are significantly and moderately associated, with a roughly seven-fold rise in the odds of high fall concern among those with high kinesiophobia, yet they are not equivalent, and neither differed by gender or age group. Kinesiophobia should therefore be assessed and managed alongside fear of falling in routine physiotherapy care for older adults.

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