

# The Relationship between Kinesiophobia, Pain Intensity and Functional Disability among Elderly Individuals with Low Back Pain: A Cross-sectional Study

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## ABSTRACT

**Introduction:** Low Back Pain (LBP) is the most common health problem among elderly individuals, leading to pain and disability. Alongside pain, psychosocial factors have a significant impact on patients with LBP. Kinesiophobia is defined as a fear of physical movement and activity, which can result in avoidance of activities and movement, leading to deconditioning. The relationship between kinesiophobia and pain severity is complex and interrelated, with each affecting the other and restricting the patient's participation in daily activities.

**Aim:** To investigate the relationship between kinesiophobia, pain severity, and functional disability in older people with LBP.

**Materials and Methods:** A total of 49 participants over 60 years old with LBP were recruited for this cross-sectional study at the Department of Physiotherapy, Nitte Institute of Physiotherapy, Deralakatte, Mangaluru, Karnataka, India. Subjects were recruited from March 2022 to February 2023 based on inclusion criteria. Screened participants completed a self-reported questionnaire,

The subjects themselves filled out the outcome tools, including the Tampa Scale of Kinesiophobia (TSK) Questionnaire, the Roland Morris Disability Questionnaire tool, and the Numerical Pain Rating Scale (NPRS) to assess various aspects of kinesiophobia, functional disability, and pain severity. Pearson's correlation coefficient was used to determine the correlation between kinesiophobia, pain severity, and functional disability. A p-value <0.05 was considered statistically significant.

**Results:** The age of the elderly participants ranged from 60 to 84 years, with a mean age of 70.9±6.5 years. Positive correlation was found between kinesiophobia and functional disability (r value=0.464, p-value=0.001), while no correlation was observed between kinesiophobia and pain intensity.

**Conclusion:** It is concluded that kinesiophobia may contribute to disability, as a positive relationship between kinesiophobia and functional disability was observed in individuals with LBP. However, no correlation was found between kinesiophobia and pain intensity.

**Keywords:** Numerical pain rating scale, Roland-Morris disability questionnaire, Tampa scale of kinesiophobia

## INTRODUCTION

Low back pain is the most common health problem among elderly individuals, leading to pain and disability. Older individuals, especially those aged 60 years or older, have a higher risk of experiencing persistent back pain lasting longer than three months and represent the second most common age group seeking care for LBP [1]. This population also faces challenges in completing functional activities, which further diminishes their mobility. Mobility is essential for older individuals to maintain functional independence [2].

The prevalence of LBP increases from adolescence to 60 years of age. Across the world, the prevalence of LBP in seniors ranges from 13% to 50% [1]. The prognosis of LBP may be directly related to the duration of symptoms [3]. In assessing the level of disability in LBP and identifying factors influencing the relationship between pain severity and rehabilitation, the intensity of pain plays a crucial role [4]. Additionally, psychosocial factors have a significant impact on patients, as movements that increase pain can elicit fear and lead individuals to avoid such movements, resulting in reduced activity and strength [3].

According to the fear-avoidance model, psychological behaviours, such as pain and fear of pain associated with movements, are related to cognitive-behavioural factors affecting pain intensity and disability [4]. Kinesiophobia is defined as a state where an individual experiences excessive fear of physical movement and activity due to the perceived susceptibility to painful injury [2]. Kinesiophobia has been identified as a significant factor in the progression of pain from the acute to chronic stage. It is recognised as a risk factor for

chronicity in LBP and a significant predictor of pain disability in the chronic pain population [5]. This fear may lead individuals with chronic pain to avoid activities and movements, resulting in deconditioning and disuse [6]. Research has shown that a history of pain and its memory can trigger pain and initiate the fear of movement, causing patients to adopt pain avoidance behaviours. Prolonged pain can result in disengagement from functional activities [7].

Back pain is subjective, making it challenging to assess a patient's perception of their level of physical function in relation to their impairment [8]. Kinesiophobia not only limits the musculoskeletal system by deconditioning it but also creates functional disabilities and restrictions on social and recreational activities, which may lower the quality of life. LBP can affect sleep patterns, cause muscle weakness, and reduce movement in the spine and limbs. Extrinsic factors, including the person's living situation and health status, also play a role in disability. These two factors frequently overlap and have complexities that impact one another, limiting the patient's ability to perform daily activities. Therefore, it is necessary to develop strategies to prevent kinesiophobia in individuals with LBP [3].

Hence, the primary aim of the present study was to determine the relationship between kinesiophobia, pain severity, and functional disability in older people with LBP, using the TSK, the NPRS, and the Roland-Morris Disability Questionnaire.

## MATERIALS AND METHODS

A cross-sectional study was conducted from March 2022 to February 2023 at the Department of Physiotherapy in Justice KS

Hegde Hospital, Deralakatte, Mangaluru, India. Institutional Ethics Committee (IEC) approval (NIPT/IEC/Min/14/2021-2022 dated 12-02-2022) was obtained and prospectively registered in the Clinical Trial Registry of India database (CTRI/2022/08/045028). Additionally, written informed consent was obtained from all participants.

**Inclusion and Exclusion criteria:** Both males and females aged 60 years or above, experiencing non specific LBP with pain, were included in the study [9]. Participants with a history of significant back trauma, recent trauma or back fracture, surgery, spinal cord injuries, tumours, neurogenic or radicular conditions, or cognitive impairment preventing them from providing signed informed consent were excluded from the study.

**Sample size calculation:** The required sample size was determined to be 49 based on the correlational coefficient value of 0.373 between the TSK and the Roland-Morris Disability Questionnaire, with 80% power and a 5% alpha error for a two-sided hypothesis. The sample size calculation was performed using “n Master” software version 2.0.

### Study Procedure

The study procedure was explained, and written consent forms were obtained from the participants. Screening was conducted to ensure participants met the inclusion and exclusion criteria, and those meeting the inclusion criteria were recruited for the study.

Demographic data of the subjects were collected and recorded. The subjects themselves filled out the outcome tools. The TSK questionnaire was used to assess kinesiophobia [10], the NPRS was utilised to assess the intensity of pain [9], and the Roland-Morris Disability Questionnaire tool was used to assess functional disability [11].

**Tampa Scale of Kinesiophobia (TSK)-17 [10]:** The TSK-17 measures the level of fear of movement. It consists of 17 items, and each item is scored on a 4-point scale ranging from “strongly disagree” to “strongly agree”. The scoring range for TSK-17 is 17 to 68, with scores above 37 generally indicating a high level of kinesiophobia [10]. Higher scores indicate a higher level of kinesiophobia. The TSK-17 has an acceptable level of internal consistency (Cronbach’s alpha of 0.81) and test-retest reliability (ICC=0.91) [10].

**Numerical pain rating scale:** This scale is an 11-point numeric pain scale ranging from 0 to 10. A score of 0 indicates “no pain” and a score of 10 indicates the “worst possible pain” at the time of assessment. It is a simple instrument that is easy to apply [9]. Participants choose a whole number that best represents their pain intensity. Higher scores indicate greater pain severity [9].

**Roland-Morris disability questionnaire:** The Roland-Morris Disability Questionnaire is a tool for assessing the functional state of individuals with LBP. This questionnaire has strong psychometric qualities and an internal consistency of 0.85 [12]. It consists of 24 items that cover regular activities in daily living, and participants rate their level of difficulty in performing these activities. Each answer is given 1 point, and a total score ranging from 0 to 24 is computed. A score of zero signifies the least disability, while scores greater than or equal to 14 are classified as indicating limited functional ability [11].

### STATISTICAL ANALYSIS

The data were analysed using Statistical Package for Social Sciences (SPSS) software (SPSS Inc.; Chicago, IL) version 26.0. Descriptive statistics such as frequency, percentage, mean, and Standard Deviation (SD) were used to summarise the collected data. Pearson’s correlation coefficient  $\{r = \frac{\sum (xi - \text{mean} * yi - \text{mean})}{\sqrt{(\sum (xi - \text{mean})^2 * (\sum (yi - \text{mean})^2))}}$  was employed to determine the correlation between kinesiophobia, pain severity, and functional disability. A p-value <0.05 was considered significant.

## RESULTS

The present study was conducted among 49 elderly individuals with LBP. The age of the elderly participants ranged from 60 to 84 years, with a mean age of 70.9±6.5 years. The NPRS scores ranged from 6 to 9, with a mean of 7.7±0.8 [Table/Fig-1]. The majority of the participants (53.1%) were males [Table/Fig-2]. The mean kinesiophobia score for the study population was 59.6±4.0, and the mean Roland-Morris Disability Questionnaire score was 22±1.4 [Table/Fig-3].

Variables	Range	Mean	SD
Age	60 to 84	70.9	6.5
NRPS	6 to 9	7.7	0.8

[Table/Fig-1]: Descriptive statistics for age and NPRS.

Gender	Frequency (n)	Percentage (%)
Male	26	53.1
Female	23	46.9

[Table/Fig-2]: Gender distribution.

Variables	Range	Mean	SD
Kinesiophobia (TSK)	46 to 68	59.6	4.0
Roland Morris disability questionnaire	19 to 24	22.0	1.4

[Table/Fig-3]: Descriptive statistics for kinesiophobia (Tampa Scale) and Roland-Morris Disability questionnaire.

To examine the correlation between kinesiophobia, pain severity, and functional disability, Pearson’s correlation coefficient was used. There was a positive correlation between kinesiophobia and functional disability ( $p < 0.01$ ,  $r = 0.464$ ), which was statistically significant [Table/Fig-4].

Variables		Pain (NRPS)	Kinesiophobia (Tampa scale)	Functional disability
Pain (NRPS)	“r”	1	0.084	-0.046
	p-value	--	0.566	0.0753
Kinesiophobia (Tampa scale)	“r”		1	0.464
	p-value		--	0.001*
Functional disability	“r”			1
	p-value			--

[Table/Fig-4]: Relation between Kinesiophobia, pain severity, and functional disability. (\*Significant; “r”=Pearson’s correlation coefficient)

## DISCUSSION

According to the biopsychosocial model, some people with musculoskeletal pain develop chronic pain based on fear of pain, specifically the concern that movement may trigger pain or reinjure them. It is proposed that two conflicting behavioural responses exist: 1) people decide to manage discomfort to improve and engage in functional activities, reasoning that it shouldn’t hinder them, or 2) people choose to maintain a fear of movement, believing that doing so will cause pain [4].

In a study by Ishak NA et al., no correlation was found between kinesiophobia and pain intensity in elderly individuals with LBP [2]. The present study yielded similar results, showing no correlation between kinesiophobia and pain severity. These findings do not support the hypothesis that kinesiophobia and pain severity are related.

Kinesiophobia not only limits the musculoskeletal system by causing deconditioning but also leads to functional disabilities. The present research deepens the understanding of the psychological factors contributing to disability. Fear of movement can result in avoidance and inactivity, which are seen as protective actions but ultimately increase functional limitations in daily life [13].

The progression of impairment in LBP is predicted by kinesiophobia. LBP commonly affects regular daily activities such as lifting, standing, sitting, and travelling. Therefore, identifying limitations that hinder daily tasks is important [13]. One factor that could contribute to disability is kinesiophobia, which may also be one of the fundamental mechanisms through which pain leads to impairment. The current study found an association between kinesiophobia and functional disability, supporting the hypothesis that there is a correlation between kinesiophobia and functional disability.

In studies by Luque-Suarez A et al., it was found that functional impairment in elderly people with LBP was correlated with kinesiophobia. The present study also revealed a positive link between kinesiophobia and functional impairment in older people with LBP [7]. While no correlation was found between kinesiophobia and pain, there is a direct correlation between kinesiophobia and functional impairment in older adults with LBP. Therefore, kinesiophobia contributes to disability in the elderly population.

### Limitation(s)

The use of drugs or medication for pain was not questioned in the current study. Studies that take medication use into account can be conducted in the future.

### CONCLUSION(S)

The aim of the present study was to investigate the relationship between kinesiophobia, pain severity, and functional disability in older people with LBP. No correlation was found between kinesiophobia and pain intensity. However, a positive correlation was observed between kinesiophobia and functional disability, suggesting that kinesiophobia has a significant impact on functional disability in elderly patients with LBP.

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