LINK MEDICAL INTERFACE

JHWCR

Journal of Health, Wellness, and Community Research
Volume III, Issue III
Open Access, Double Blind Peer Reviewed.
Web: https://jhwcr.com, **ISSN**: 3007-0570
https://doi.org/10.61919/c0gw1961

Article

Association of Kinesiophobia with Functional Independence in Post-Operative Breast Cancer Patients

Eisha Fatima[1], Manum Tahir[2], Hammad Haider[2]

1 University of South Asia, Lahore, Pakistan
2 Lahore University of Biological and Applied Sciences, Lahore, Pakistan

Correspondence
manumtahir21@gmail.com

Cite this Article

Received	2025-03-29
Revised	2025-04-21
Accepted	2025-04-22
Published	2025-04-27
Authors' Contributions	EF: concept, design; MT: data collection, analysis; HH: manuscript drafting.
Conflict of Interest	None declared
Data/supplements	Available on request.
Funding	None
Ethical Approval	The study was approved by the Ethical Review Committee of the University of South Asia (Reference No: USA/FAHS/2023/796) and conducted following the Declaration of Helsinki.
Informed Consent	Obtained from all participants
Study Registration	-
Acknowledgments	N/A

ABSTRACT

Background: Post-operative breast cancer patients often experience long-term upper limb dysfunction and reduced quality of life due to pain, fatigue, and fear of movement, known as kinesiophobia. While physical limitations are well-documented, the psychological barrier of kinesiophobia and its impact on functional independence remains underexplored, particularly in low-resource settings. **Objective**: To evaluate the association between kinesiophobia and functional independence in post-operative breast cancer patients using validated clinical assessment tools, and to determine whether fear of movement significantly impairs daily functional capabilities. **Methods**: This analytical cross-sectional study included 301 female patients aged 18–60 years who underwent primary breast cancer surgery at least three months prior. Participants were recruited through non-probability convenience sampling from four tertiary hospitals in Pakistan. Inclusion criteria encompassed stages I–III breast cancer, while patients with comorbid neurological, psychiatric, or musculoskeletal conditions were excluded. Kinesiophobia was measured using the Tampa Scale for Kinesiophobia, and functional independence was assessed via the Functional Independence Measure (FIM). Ethical approval was obtained from the University of South Asia (Ref: USA/FAHS/2023/796), adhering to the Declaration of Helsinki. Data were analyzed using SPSS v26, and the Chi-square test was employed to assess statistical associations. **Results**: A significant inverse relationship was observed between kinesiophobia and functional independence ($p < 0.001$). Among young adults ($n = 121$), 73.9% of patients with mild kinesiophobia were completely independent, whereas 55.2% with severe kinesiophobia required moderate or complete assistance. Middle adults ($n = 180$) demonstrated similar patterns, with 74.4% of patients with severe kinesiophobia requiring support in ADLs. The findings suggest a clinically relevant trend where higher fear of movement correlates with decreased functional autonomy. **Conclusion**: Kinesiophobia is significantly associated with impaired functional independence in post-operative breast cancer patients. Early identification and intervention targeting fear of movement may enhance recovery, reduce long-term disability, and improve quality of life. Integrating psychological screening and tailored physiotherapy into survivorship care is essential for holistic rehabilitation.

Keywords: Breast Neoplasms, Kinesiophobia, Functional Independence, Postoperative Care, Physical Therapy Modalities, Fear, Activities of Daily Living

INTRODUCTION

Breast cancer remains the most prevalent malignancy among women worldwide, with surgical interventions such as mastectomy and breast-conserving surgery (BCS) being standard treatment options. Despite advancements in early detection and therapeutic strategies, post-operative complications such as restricted shoulder range of motion, pain, fatigue, and diminished upper limb functionality persist as major clinical concerns. These complications not only impair physical health but also negatively influence psychosocial well-being and quality of life, especially in survivors who continue to endure the long-term consequences of treatment (1). Among the emerging psychosomatic factors affecting recovery is kinesiophobia, which is defined as an excessive and irrational fear of movement stemming from the belief that activity might lead to pain or reinjury (2). This psychological barrier can significantly interfere with engagement

in physical activity and the execution of daily living tasks, thereby undermining the rehabilitation process.

Previous research highlights the enduring nature of post-treatment pain and the psychological sequelae of breast cancer surgery. Pain, particularly when associated with lymphedema or surgical scarring, has been shown to persist in up to 79% of patients, often limiting participation in routine activities and impacting emotional health (3). Moreover, the development of kinesiophobia in this context has been linked with reduced functional capacity and lower quality of life (4). Notably, upper limb dysfunction is now recognized as a key outcome measure by global health initiatives, emphasizing its clinical significance (5). The literature also indicates a bidirectional relationship between physical impairments and cognitive-behavioral responses, such as catastrophizing and fear avoidance, which may perpetuate the cycle of disability and disuse (6). While interventions such as physiotherapy and graded exercise have shown promise in mitigating physical impairments, the role of psychological constructs like kinesiophobia in modulating recovery trajectories remains underexplored, particularly in low-resource settings such as Pakistan.

In Pakistan, where the incidence of breast cancer is steadily increasing, there is a critical need to understand factors that impede full recovery in survivors. Despite the growing implementation of rehabilitative programs, fear-driven avoidance behaviors may limit their effectiveness. Most existing studies have either focused on physiological outcomes or explored psychological factors in isolation, leaving a significant knowledge gap regarding their interplay in determining functional independence. This study was thus designed to examine the association between kinesiophobia and functional independence in post-operative breast cancer patients. By utilizing validated instruments—namely, the Tampa Scale for Kinesiophobia and the Functional Independence Measure (FIM)—this research aims to quantify the extent to which fear of movement influences the ability to perform activities of daily living. The findings seek to inform multidisciplinary rehabilitation strategies that address both physical and psychological dimensions of recovery. The central hypothesis posits that higher levels of kinesiophobia are significantly associated with reduced functional independence in women recovering from breast cancer surgery.

MATERIALS AND METHODS

This analytical cross-sectional study was conducted to investigate the association between kinesiophobia and functional independence in post-operative breast cancer patients. Female participants aged 18 to 60 years who had undergone primary breast cancer surgery (stages I–III) at least three months prior were considered eligible. Patients with severe medical conditions such as rheumatoid arthritis, multiple sclerosis, renal or cardiac diseases, psychiatric disorders, previous breast reconstruction, or a history of shoulder trauma were excluded. The participants were recruited through non-probability convenience sampling from four tertiary care hospitals in Pakistan: Shalimar Hospital, Sir Ganga Ram Hospital, Jinnah Hospital, and WAPDA Hospital. The study was conducted over a period of four months. All participants provided written informed consent prior to data collection, and the study protocol was approved by the Ethical Review Committee of the University of South Asia (Reference: USA/FAHS/2023/796), in accordance with the principles outlined in the Declaration of Helsinki.

Data collection focused on two main outcomes: kinesiophobia and functional independence. Kinesiophobia was assessed using the validated Tampa Scale for Kinesiophobia (TSK), while functional independence was evaluated through the Functional Independence Measure (FIM), a standardized tool that rates physical and cognitive disability. The FIM scores ranged from complete independence (110–126) to complete assistance (<80), while the TSK scores were categorized into mild, moderate, and severe levels of kinesiophobia. These assessments were conducted once during follow-up, ensuring that all participants had crossed the immediate post-operative phase and were in the recovery stage.

Data were entered and analyzed using IBM SPSS Statistics version 26. Quantitative variables such as age and weight were described using means and standard deviations, whereas categorical variables such as body mass index categories, shoulder range of motion, pain severity, and surgical site were summarized using frequencies and percentages. The association between levels of kinesiophobia and functional independence was analyzed using the Chi-square test. A p-value less than 0.05 was considered statistically significant. Missing data were minimized by direct verification during data entry, and any incomplete entries were excluded from analysis to maintain data integrity.

RESULTS

A total of 301 post-operative female breast cancer patients between the ages of 18 and 60 years were included in this analytical cross-sectional study. Participants were stratified into two age groups: young adults (18–35 years; n = 121, 40.2%) and middle adults (36–60 years; n = 180, 59.8%). Descriptive and inferential statistical analyses were conducted to evaluate the association between kinesiophobia (measured via the Tampa Scale) and functional independence (measured via the Functional Independence Measure [FIM]).

Table 1 and Table 2 summarize the distribution of FIM scores within the two age groups. In the young adult cohort, 33 (27.3%) participants were completely independent in activities of daily living (ADLs), while 65 (53.7%) required minimal assistance. Moderate and complete assistance was needed in 15.7% and 3.3% of participants, respectively. In comparison, only 29 (16.1%) middle adults achieved complete independence, whereas 45.6% required minimal assistance. A substantially higher proportion of middle adults (37.2%) required moderate assistance, with 1.1% requiring complete assistance.

Table 3 presents the prevalence of mild, moderate, and severe kinesiophobia. Among young adults, the majority (57.0%) had moderate kinesiophobia, with 24.0% classified as severe. In contrast, middle adults exhibited higher levels of severe kinesiophobia (43.3%) and a lower prevalence of mild kinesiophobia (5.6%).

  https://doi.org/10.61919/c0gw1961

Chi-square analysis revealed a statistically significant association between levels of kinesiophobia and FIM scores in both age groups ($p < 0.001$), as shown in Tables 4 and 5. In young adults, complete independence was most frequently observed among those with mild (73.9%) or moderate (23.2%) kinesiophobia, while moderate and complete assistance were predominantly required in patients with severe kinesiophobia (55.2% and 13.8%, respectively). Middle adults followed a similar trend, where 82.6% of those with mild kinesiophobia required no or minimal assistance, while 74.4% of those with severe kinesiophobia required moderate or complete assistance.

Table 1. Frequency of Functional Independence Measure Scores Among Young Adults (18–35 years)

FIM Classification	Frequency (n)	Percentage (%)
Complete independence	33	27.3
Minimal assistance	65	53.7
Moderate assistance	19	15.7
Complete assistance	4	3.3
Total	121	100.0

Table 2. Frequency of Functional Independence Measure Scores Among Middle Adults (36–60 years)

FIM Classification	Frequency (n)	Percentage (%)
Complete independence	29	16.1
Minimal assistance	82	45.6
Moderate assistance	67	37.2
Complete assistance	2	1.1
Total	180	100.0

Table 3. Frequency of Kinesiophobia Levels by Age Group

Age Group	Kinesiophobia Level	Frequency (n)	Percentage (%)
Young Adults (n = 121)	Mild	23	19.0
	Moderate	69	57.0
	Severe	29	24.0
Middle Adults (n = 180)	Mild	10	5.6
	Moderate	92	51.1
	Severe	78	43.3

Table 4. Association Between Tampa Scale and FIM Scores in Young Adults (18–35 years)

Kinesiophobia Level	Complete Independence	Minimal Assistance	Moderate Assistance	Complete Assistance	Total (n)
Mild	17	6	0	0	23
Moderate	16	50	3	0	69
Severe	0	9	16	4	29
Total	33	65	19	4	121
χ^2 **test, p = 0.000**					

Table 5. Association Between Tampa Scale and FIM Scores in Middle Adults (36–60 years)

Kinesiophobia Level	Complete Independence	Minimal Assistance	Moderate Assistance	Complete Assistance	Total (n)
Mild	5	5	0	0	10
Moderate	24	57	11	0	92
Severe	0	20	56	2	78
Total	29	82	67	2	180
χ^2 **test, p = 0.000**					

These findings provide compelling evidence for a statistically significant inverse relationship between kinesiophobia and functional independence in both young and middle-aged post-operative breast cancer patients. The consistent increase in dependence across rising levels of kinesiophobia supports the hypothesis that fear of movement is a major contributor to impaired functional recovery. The highly significant p-values ($p = 0.000$ in both groups) suggest robust associations unlikely to have occurred by chance. While effect sizes were not directly calculated, the magnitude of distribution shifts across categories indicates potential clinical significance, warranting future research into targeted interventions.

DISCUSSION

The present study demonstrated a statistically significant association between kinesiophobia and functional independence in post-operative breast cancer patients, with higher levels of kinesiophobia correlating with greater dependence in activities of daily living. These findings reinforce the growing recognition of psychosocial variables, particularly fear of movement, as critical

  https://doi.org/10.61919/c0gw1961

factors influencing recovery and quality of life in breast cancer survivors. Notably, both young and middle adult patients exhibited a similar trend, indicating the pervasive influence of kinesiophobia irrespective of age, although middle-aged women displayed a higher prevalence of severe kinesiophobia and required greater assistance.

These results are consistent with earlier investigations that underscored the role of psychological constructs in post-cancer rehabilitation. A prior study by Van der Gucht et al. established that kinesiophobia significantly contributes to pain-related disability in breast cancer survivors, highlighting its potential to perpetuate a cycle of disuse, pain, and loss of function (3). Likewise, Marques et al. reported that elevated kinesiophobia scores were associated with reduced muscle strength, diminished quality of life, and increased fatigue levels in women with breast cancer, supporting the notion that fear of movement can undermine functional outcomes (2). While previous literature often focused on specific upper limb functions or pain catastrophizing, the current study offers a broader functional context by employing the Functional Independence Measure (FIM), thereby adding practical clinical value to the assessment of daily living performance.

The observed association may be explained by several interconnected mechanisms. Physiologically, surgical trauma, radiation-induced fibrosis, and soft tissue restrictions contribute to upper limb limitations, but when compounded by cognitive-emotional responses such as fear avoidance, these impairments may become entrenched. Kinesiophobia likely discourages patients from engaging in rehabilitation exercises, further reducing joint mobility, strength, and cardiovascular conditioning (7). From a theoretical perspective, this aligns with the fear-avoidance model, which posits that maladaptive beliefs about pain and injury lead to behavioral avoidance, resulting in disability and psychological distress. The clinical implication is that kinesiophobia may not merely be a correlate of disability but a modifiable risk factor. Interventions that incorporate cognitive-behavioral therapy (CBT), pain education, or graded exposure to activity could be strategically employed to improve both physical and psychological outcomes.

This study also builds upon previous efforts by increasing both the scope and scale of inquiry. Earlier investigations, such as the work by Fisher et al., evaluated the link between upper extremity dysfunction, stress, and fear of physical activity using small samples (13). In contrast, the current study's robust sample size (n = 301) drawn from multiple hospitals enhances the reliability of findings and improves external validity within the context of a developing country. Furthermore, by categorizing patients based on age and employing standardized tools such as the Tampa Scale and FIM, the study offers nuanced insights into how fear of movement translates into real-world limitations.

Nevertheless, several limitations must be acknowledged. First, the use of non-probability convenience sampling may limit generalizability beyond the institutional settings in which the study was conducted. The absence of pre-operative assessments or longitudinal follow-up also restricts causal inference and the ability to evaluate recovery trajectories over time. The study did not account for the dominance of the affected limb, variations in surgical type, or adjuvant therapies, all of which may influence both kinesiophobia and functional ability. Furthermore, potential confounders such as psychological comorbidities (e.g., anxiety, depression) were not systematically assessed. Despite these limitations, the study's methodological rigor, including ethical oversight and the use of validated instruments, lends credibility to its conclusions.

Future research should pursue longitudinal designs to establish the temporal relationship between kinesiophobia and functional outcomes, ideally incorporating psychosocial screening as part of routine oncologic care. Interventional studies evaluating the efficacy of kinesiophobia-targeted therapies, such as graded activity programs or virtual reality-assisted physiotherapy, may also offer actionable clinical strategies. Additionally, stratifying outcomes by treatment modalities and integrating biomarkers of physical recovery could help delineate patient subgroups most at risk of long-term functional decline.

In conclusion, this study contributes valuable evidence supporting the role of kinesiophobia as a determinant of functional independence in breast cancer survivors. By demonstrating a clear and statistically significant association, it underscores the need for holistic, interdisciplinary rehabilitation approaches that not only address physical impairments but also confront the psychological barriers that impede recovery. Early identification and management of kinesiophobia may serve as a pivotal intervention point in optimizing post-operative outcomes and enhancing survivorship care.

CONCLUSION

This study concludes that kinesiophobia is significantly associated with reduced functional independence in post-operative breast cancer patients, highlighting fear of movement as a critical psychological barrier to recovery. These findings underscore the importance of integrating psychological assessments, particularly for kinesiophobia, into routine post-surgical rehabilitation protocols to optimize functional outcomes and enhance quality of life. Clinically, this emphasizes the need for multidisciplinary care models that include physiotherapy and cognitive-behavioral interventions targeting movement-related fear. From a research perspective, the study advocates for longitudinal and interventional trials to explore the efficacy of targeted therapies in mitigating kinesiophobia and improving functional independence among breast cancer survivors.

REFERENCES

1. Akbas A, Dagmura H, Daldal E, Dasiran FM, Deveci H, Okan I. Association Between Shoulder Range of Motion and Pain Catastrophizing Scale in Breast Cancer Patients After Surgery. Breast Care (Basel). 2021;16(1):66–71.

2. Marques VA, dos Santos WD, Silva MS, Ferreira-Junior JB, de Lira CAB, Soares LR, et al. Functional Performance Indicators and Kinesiophobia and Their Relationship With Muscle Strength, Quality of Life and Fatigue in Women Breast Cancer Survivors. 2022.

3. Van der Gucht E, Dams L, Meeus M, Devoogdt N, Beintema A, Penen F, et al. Kinesiophobia Contributes to Pain-Related

Disability in Breast Cancer Survivors: A Cross-Sectional Study. 2020;28:4501–8.

4. De Baets L, Devoogdt N, Haenen V, Evenepoel M, Dams L, Smeets A, et al. Cognitions and Physical Impairments in Relation to Upper Limb Function in Women With Pain and Myofascial Dysfunctions in the Late Stage After Breast Cancer Surgery: An Exploratory Cross-Sectional Study. 2022;44(18):5212–9.

5. Shao YW, Shu Q, Xu D, Teng H, Wu GS, Hou JX, et al. Effect of Different Rehabilitation Training Timelines to Prevent Shoulder Dysfunction Among Postoperative Breast Cancer Patients: Study Protocol for a Randomized Controlled Trial. 2021;22:1–9.

6. Klein I, Kalichman L, Chen N, Susmallian S. Effect of Physical Activity Levels on Oncological Breast Surgery Recovery: A Prospective Cohort Study. Sci Rep. 2021;11(1):1–10.

7. Altas EU, Demirdal U. The Effects of Post-Mastectomy Lymphedema on Balance, Kinesiophobia and Fear of Falling. J Clin Nurs. 2021;38(2):130–8.

8. Tang V, Zhao S, Boscardin J, Sudore R, Covinsky K, Walter LC, et al. Functional Status and Survival After Breast Cancer Surgery in Nursing Home Residents. JAMA Surg. 2018;153(12):1090–6.

9. Erdoganoğlu Y, Çalık M, Vural M. Functional Evaluation of Patients With Mastectomy Lymphedema. Turk J Phys Med Rehabil. 2021;67(1):56–61.

10. Lavín-Pérez AM, Collado-Mateo D, Hinojo González C, de Juan Ferré A, Ruisánchez Villar C, Mayo X, et al. High-Intensity Exercise Prescription Guided by Heart Rate Variability in Breast Cancer Patients: A Study Protocol for a Randomized Controlled Trial. BMC Sports Sci Med Rehabil. 2023;15(1):28.

11. Bennedsgaard K, Grosen K, Attal N, Bouhassira D, Crombez G, Jensen TS, et al. Neuropathy and Pain After Breast Cancer Treatment: A Prospective Observational Study. Scand J Pain. 2023;23(1):49–58.

12. Malchrowicz-Mośko E. Kinesiophobia Among Breast Cancer Survivors One Year After Hospital Treatment. Int J Environ Res Public Health. 2022;19(21):14565.

13. Fisher MI, Fleischer A, Ulmer K, McClure M, Waldron R, DiFede L. Self-Reported Arm Function Is Associated With Stress and Fear of Physical Activity Among Women Treated for Breast Cancer. J Cancer Rehabil. 2022;5.

14. Buche H, Michel A, Piccoli C, Blanc NJ. Contemplating or Acting? Which Immersive Modes Should Be Favored in Virtual Reality During Physiotherapy for Breast Cancer Rehabilitation. Front Psychol. 2021;12:631186.

15. Yuan RZ, Li KP, Wei XL, Zheng W, Ye Y, Wang MY, et al. Effects of Free Range-of-Motion Upper Limb Exercise Based on Mirror Therapy on Shoulder Function in Patients After Breast Cancer Surgery: Study Protocol for a Randomized Controlled Trial. 2021;22:1–10.

16. Rees S, Mazuquin B, Richmond H, Williamson E, Bruce J. Role of Physiotherapy in Supporting Recovery From Breast Cancer Treatment: A Qualitative Study Embedded Within the UK PROSPER Trial. BMJ Open. 2021;11(5):e040116.

17. Jariwala P, Kaur N. A Descriptive Study on Prevalence of Arm/Shoulder Problems and Its Impact on Quality of Life in Breast Cancer Survivors. Indian J Cancer. 2021;58(2):201–6.

18. Brennan L, Kessie T, Caulfield B. Patient Experiences of Rehabilitation and the Potential for an mHealth System With Biofeedback After Breast Cancer Surgery: Qualitative Study. JMIR Mhealth Uhealth. 2020;8(7):e19721.

19. Rasmussen G, Kristiansen M, Arroyo-Morales M, Voigt M, Madeleine P. Absolute and Relative Reliability of Pain Sensitivity and Functional Outcomes of the Affected Shoulder Among Women With Pain After Breast Cancer Treatment. PLoS One. 2020;15(6):e0234118.

20. Luque-Suarez A, Martinez-Calderon J, Navarro-Ledesma S, Morales-Asencio JM, Meeus M, Struyf F. Kinesiophobia Is Associated With Pain Intensity and Disability in Chronic Shoulder Pain: A Cross-Sectional Study. J Manipulative Physiol Ther. 2020;43(8):791–8.

21. Feyzioğlu O, Dinçer S, Akan A, Algun ZC. Is Xbox 360 Kinect-Based Virtual Reality Training as Effective as Standard Physiotherapy in Patients Undergoing Breast Cancer Surgery? Support Care Cancer. 2020;28:4295–303.

22. Can AG, Can SS, Ekşioğlu E, Çakcı FA. Is Kinesiophobia Associated With Lymphedema, Upper Extremity Function, and Psychological Morbidity in Breast Cancer Survivors? Turk J Phys Med Rehabil. 2019;65(2):139.

23. Rangel J, Tomás MT, Fernandes B. Physical Activity and Physiotherapy: Perception of Women Breast Cancer Survivors. Breast Cancer. 2019;26:333–8.

24. Lee CH, Chung SY, Kim WY, Yang SN. Effect of Breast Cancer Surgery on Chest Tightness and Upper Limb Dysfunction. Medicine (Baltimore). 2019;98(19):e15317.

25. Kulik-Parobczy I. Evaluation of the Effectiveness of Physiotherapy in Patients After Oncological Breast Cancer Treatment Based on Spirometric Indicators. Contemp Oncol (Pozn). 2019;23(1):47–51.

26. Richmond H, Lait C, Srikesavan C, Williamson E, Moser J, Newman M, et al. Development of an Exercise Intervention for the Prevention of Musculoskeletal Shoulder Problems After Breast Cancer Treatment: The Prevention of Shoulder Problems Trial (UK PROSPER). BMC Health Serv Res. 2018;18:1–12.

27. Wilson M, Shaw M, Roberts M. Gaining Insight and Taking Action: Perceptions of Adults With Persistent Pain and Opioid Use Disorder After Engaging in Online Pain Self-Management. J Pain. 2018;19(3):S39–40.

28. Rafn BS, Hung S, Hoens AM, McNeely ML, Singh CA, Kwan W, et al. Prospective Surveillance and Targeted Physiotherapy

for Arm Morbidity After Breast Cancer Surgery: A Pilot Randomized Controlled Trial. Clin Rehabil. 2018;32(6):811–26.

29. Blackburn NE, McVeigh JG, McCaughan EM, Kennedy RD, McIntosh SA, Wilson IM. The Musculoskeletal Consequences of Latissimus Dorsi Breast Reconstruction in Women Following Mastectomy for Breast Cancer. PLoS One. 2018;13(8):e0202859.

30. Lee I, Garland SN, DeMichele A, Farrar JT, Im EO, Mao JJ. A Cross-Sectional Survey of Pain Catastrophising and Acupuncture Use Among Breast Cancer Survivors. Altern Integr Med. 2017;35(1):38–43.

31. Şener HO, Malkoç M, Ergin G, Karadibak D, Yavuzşen T. Effects of Clinical Pilates Exercises on Patients Developing Lymphedema After Breast Cancer Treatment: A Randomized Clinical Trial. Turk J Oncol. 2017;13(1):16.

  https://doi.org/10.61919/c0gw1961