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A Framework For Assessing Cancer Survivor Reporting Kinesiophobia: Systematic Review

Nishat Alam* ,Prof. (Dr.) Nidhi Singh**

*Research Scholar, Bachelor of Physiotherapy, Department of Physiotherapy, Galgotias University, Greater Noida, Uttar Pradesh, India

**Professor, Department of Physiotherapy, Galgotias University, Greater Noida, Uttar Pradesh, India

ABSTRACT

Background: Kinesiophobia, or the fear of movement, significantly impacts cancer survivors, affecting their physical activity levels, self-care behaviors, quality of life, and overall rehabilitation outcomes. This systematic review aimed to develop a comprehensive framework for reporting kinesiophobia among cancer survivors by synthesizing recent research findings.

Methods: An extensive search was conducted using predetermined keywords in databases including PubMed/MEDLINE, Cochrane Library, CINAHL, PsycINFO, Embase, Scopus, and Web of Science. Studies included were peer-reviewed, human studies written in English, and specifically investigated the relationship between kinesiophobia and cancer survivorship. Data extraction focused on the types of manual exercises studied, intervention durations, outcome measures used, and key findings related to forward head posture and kinesiophobia.

Results: 12 studies were included in the review. Kinesiophobia was found to significantly impact physical activity and self-care behaviors, with notable negative effects on quality of life and functional outcomes. Psychological factors such as anxiety, depression, low self-efficacy, and high pain catastrophizing were significant predictors of kinesiophobia. Demographic factors like older age, obesity, and the presence of comorbidities further exacerbated the fear of movement. Effective interventions, including structured therapeutic exercise and educational programs, showed promise in alleviating kinesiophobia and improving related symptoms.

Conclusion: Kinesiophobia in cancer survivors is a multifaceted issue requiring a comprehensive approach that includes psychological assessment, targeted interventions, and patient education. The proposed framework for reporting kinesiophobia encompasses the assessment of psychological factors, evaluation of physical activity and self-care behaviors, identification of demographic risk factors, and the implementation of intervention and education programs. This framework aims to enhance the identification and management of kinesiophobia, ultimately improving the rehabilitation outcomes and quality of life for cancer survivors.

Keywords: Kinesiophobia, Cancer Survivors, Physical Activity, Quality of Life, Psychological Assessment, Rehabilitation, Therapeutic Exercise, Systematic Review.

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INTRODUCTION

Cancer survivorship encompasses the physical, emotional, and psychological aftermath of cancer and its treatment, extending from the time of diagnosis throughout the remainder of a person's life (Mansfield & Selhorst, 2018). This period, often marked by both relief and challenges, brings to light various issues that survivors must manage to achieve a good quality of life (Sonesson et al., 2017). Among these issues, kinesiophobia, or the fear of movement, has emerged as a significant barrier to successful rehabilitation and long-term health maintenance. Kinesiophobia is a fear-avoidance behaviour that can severely restrict physical activity, complicating recovery and leading to further health complications. Understanding and addressing kinesiophobia in cancer survivors is essential for improving their overall well-being and quality of life (Flanigan et al., 2013; George et al., 2008).

Physical activity is a cornerstone of cancer rehabilitation. Numerous studies have shown that regular exercise can help mitigate the side effects of cancer treatment, improve physical function, reduce fatigue, and enhance psychological well-being (Gholami et al., 2020; Hart et al., 2015). For instance, physical activity has been associated with improved cardiovascular health, better body composition, and enhanced immune function, which are crucial for cancer survivors who are at increased risk of comorbid conditions. Furthermore, engaging in regular exercise has been linked to reduced recurrence of certain cancers and improved survival rates. Despite these benefits, a significant number of cancer survivors remain physically inactive (Tajdini et al., 2021; Theunissen et al., 2020). This inactivity can be attributed to various factors, including the lingering effects of cancer treatment, such as fatigue, pain, and reduced physical capacity. However, psychological factors like kinesiophobia also play a critical role in discouraging physical activity among this population. The fear of movement can stem from concerns about pain, injury, or exacerbating their condition, creating a vicious cycle of inactivity and declining health (Harput et al., 2016).

Kinesiophobia, originally conceptualized within the context of chronic pain, refers to an excessive, irrational, and debilitating fear of physical movement and activity resulting from a feeling of vulnerability to pain or injury. This fear is not merely a reluctance to engage in physical activity but a profound psychological barrier that can significantly impact an individual's daily life (Luc-Harkey et al., 2018). In cancer survivors, kinesiophobia can manifest

due to several factors, including treatment side effects, psychological trauma, and physical deconditioning. Chemotherapy, radiation, and surgery can leave survivors with chronic pain, neuropathy, and fatigue, making the thought of physical exertion daunting. The experience of battling cancer can lead to anxiety, depression, and post-traumatic stress disorder (PTSD), which can exacerbate fears related to physical activity. Additionally, prolonged periods of inactivity during and after treatment can result in decreased physical fitness, making even simple movements feel challenging and risky(Wyngaarden et al., 2021).

Research indicates that kinesiophobia is prevalent among cancer survivors, although the exact prevalence varies depending on the cancer type, stage, and treatment modalities(Norte et al., 2019). Studies have shown that survivors of breast cancer, lung cancer, and colorectal cancer, among others, frequently report high levels of fear of movement. This fear can be particularly pronounced in those who have undergone extensive surgeries or aggressive treatments, which often result in prolonged recovery periods and significant physical and emotional strain(George et al., 2012).

The consequences of kinesiophobia in cancer survivors are multifaceted, affecting physical health, psychological well-being, and social functioning. Kinesiophobia leads to reduced physical activity, which can exacerbate deconditioning, muscle atrophy, and joint stiffness(Brewer et al., 2021). This reduction in physical activity can also increase the risk of developing comorbid conditions such as cardiovascular diseases, diabetes, and osteoporosis. The fear of movement can contribute to heightened anxiety and depression, creating a cycle where mental health deteriorates further due to physical inactivity(Tichonova et al., 2016). Additionally, kinesiophobia can lead to a sense of helplessness and decreased self-efficacy, impacting overall mental health. Socially, kinesiophobia can result in isolation, as individuals may avoid activities and social interactions that require physical movement. This isolation can further exacerbate feelings of depression and anxiety, negatively impacting quality of life(Cai et al., 2018).

Addressing kinesiophobia in cancer survivors requires a multidisciplinary approach that encompasses physical, psychological, and educational interventions. Tailored exercise programs supervised by physiotherapists can help gradually reintroduce physical activity in a controlled and safe manner, reducing the fear of injury and building confidence in movement. Cognitive-

behavioral therapy (CBT) and other psychological interventions can address the irrational fears associated with kinesiophobia, helping survivors develop coping strategies, challenge negative thoughts, and gradually confront their fears. Providing education about the benefits of physical activity and addressing misconceptions about the risks can empower cancer survivors to engage in regular exercise. Education can also include pain management techniques and strategies to safely increase physical activity levels. Despite these interventions, there remains a lack of standardized guidelines for reporting and managing kinesiophobia in cancer survivors. This gap highlights the need for a comprehensive framework that can guide healthcare professionals in assessing, documenting, and addressing kinesiophobia effectively (Priore et al., 2020; Wang & Du, 2024).

A standardized framework for reporting kinesiophobia in cancer survivors is essential for several reasons. A unified reporting framework would enable researchers to consistently document and compare the prevalence and impact of kinesiophobia across different studies and populations. Standardized guidelines would help clinicians systematically assess kinesiophobia and tailor interventions to address this fear effectively, ultimately improving patient outcomes. A clear framework would facilitate better communication between healthcare providers and patients, helping survivors understand their condition and the importance of addressing kinesiophobia.

India is experiencing a rising incidence of cancer, with estimates suggesting that nearly 1.15 million new cancer cases are diagnosed annually. The most common types of cancer include breast, cervical, oral, and lung cancers. Advances in medical treatments have improved survival rates, leading to a growing population of cancer survivors. However, the journey of survivorship is fraught with challenges, including managing the physical and psychological aftereffects of the disease and its treatment.

In India, cultural beliefs and socioeconomic factors significantly influence health behaviors and attitudes towards illness and recovery. Many Indians rely on traditional and alternative medicine, which can sometimes conflict with modern medical advice, including recommendations for physical activity. Additionally, there is often a lack of awareness about the benefits of exercise and the importance of rehabilitation post-cancer treatment.

Socioeconomic disparities also play a critical role. Access to healthcare services, including rehabilitation programs, is limited in rural areas and among economically disadvantaged

populations. These groups may face additional barriers such as lack of transportation, financial constraints, and limited availability of specialized healthcare professionals. These factors contribute to a higher prevalence of kinesiophobia as cancer survivors might not have adequate support or resources to engage in physical activity safely.

The psychological impact of cancer in India is profound. The diagnosis and treatment of cancer can lead to significant mental health issues, including anxiety, depression, and post-traumatic stress disorder (PTSD). These conditions can exacerbate kinesiophobia, making survivors fearful of engaging in physical activity due to concerns about pain, injury, or recurrence of the disease.

Stigma associated with cancer also affects mental health. In many Indian communities, cancer is viewed with fear and fatalism, leading to social isolation and reduced support for survivors. This stigma can reinforce kinesiophobia as survivors may feel discouraged from participating in social and physical activities, fearing judgment or misunderstanding from others.

Kinesiophobia presents a significant challenge for cancer survivors, hindering their rehabilitation and long-term health. By developing a comprehensive framework for reporting kinesiophobia, we can enhance our understanding of this phenomenon, improve clinical practices, and ultimately support cancer survivors in leading active, fulfilling lives. This systematic review aims to identify the prevalence, impact, and current interventions for kinesiophobia in cancer survivors and propose standardized guidelines for reporting and managing this condition.

STATEMENT QUESTION

"How does the proposed framework enhance our understanding and management of Kinesiophobia among cancer survivors, according to the findings of this systematic review?"

AIMS AND OBJECTIVES OF THE STUDY

AIM: The primary aim of the study is to develop a comprehensive framework that enhances understanding of Kinesio Phobia among cancer survivors, facilitating better diagnosis, management, and prevention strategies.

OBJECTIVE:

1. **To conduct a comprehensive review of existing literature** Identify prevalence rates, contributing factors, and impacts of Kinesio Phobia among cancer survivors, synthesizing findings to inform the development of a robust framework.
2. **To develop a diagnostic framework** Create a structured diagnostic framework based on synthesized evidence to aid healthcare professionals in accurately identifying and assessing Kinesio Phobia in cancer survivors, facilitating timely intervention and support.

NEED OF THE STUDY

Cancer survivorship has become increasingly important due to improved survival rates, but many survivors face significant challenges, including kinesiophobia, or the fear of movement. This fear can severely impede physical activity, crucial for rehabilitation and overall health. In India, unique cultural, socioeconomic, and healthcare system factors exacerbate this issue, yet there is a significant gap in research specifically addressing kinesiophobia among cancer survivors. Understanding its prevalence, impact, and effective management strategies is essential for developing comprehensive, culturally sensitive interventions that can enhance the quality of life for cancer survivors in India.

SCOPE OF THE STUDY

This study aims to comprehensively understand kinesiophobia among cancer survivors in India by identifying its prevalence, impact, and management. It will systematically review existing literature to map the extent of kinesiophobia across different cancer types and stages of survivorship. The study will explore the physical, psychological, and social consequences of kinesiophobia, emphasizing its effects on overall quality of life. Additionally, it will evaluate current interventions, such as exercise programs and cognitive-behavioral therapy, and propose a standardized framework for reporting kinesiophobia. By focusing on India's unique cultural and socioeconomic context, the study aims to develop culturally sensitive and accessible interventions to improve the rehabilitation and long-term health outcomes of cancer survivors.

METHODOLOGY

This study is a systematic review designed to evaluate the prevalence, causes, and effects of kinesiophobia among cancer survivors, with a focus on understanding its impact on various outcomes related to survivorship. To identify relevant literature, specific search terms were used, categorized into three main areas: population, intervention, and outcomes. The population search terms included "Cancer patients," "Breast cancer survivors," "Gynecological cancer survivors," "Cancer survivors," "Breast cancer," "Gynecological cancer," and "Cancer treatment." For interventions, the terms "Kinesiophobia," "Fear of movement," "Fear of physical activity," "Exercise intervention," "Therapeutic exercise," "Rehabilitation," "Physical therapy," "Exercise compliance," and "Self-care interventions" were used. The outcomes were defined by terms such as "Quality of life," "Functional performance," "Muscle strength," "Central sensitization," "Fear avoidance," "Pain," "Depression," "Anxiety," "Fatigue," "Upper extremity function," "Lymphedema," and "Psychological morbidity."

The search strategy was developed to ensure a comprehensive and inclusive review. This involved combining keywords with Boolean operators: ("Cancer patients" OR "Breast cancer survivors" OR "Gynecological cancer survivors" OR "Cancer survivors" OR "Breast cancer" OR "Gynecological cancer") AND ("Kinesiophobia" OR "Fear of movement" OR "Fear of physical activity") AND ("Exercise intervention" OR "Therapeutic exercise" OR "Rehabilitation" OR "Physical therapy" OR "Exercise compliance" OR "Self-care interventions") AND ("Quality of life" OR "Functional performance" OR "Muscle strength" OR "Central sensitization" OR "Fear avoidance" OR "Pain" OR "Depression" OR "Anxiety" OR "Fatigue" OR "Upper extremity function" OR "Lymphedema" OR "Psychological morbidity") AND ("Cross-sectional study" OR "Randomized controlled trial" OR "Longitudinal study" OR "Comparative study" OR "Systematic review" OR "Meta-analysis" OR "Retrospective study").

The databases selected for the search included PubMed/MEDLINE, Cochrane Library, CINAHL (Cumulative Index to Nursing and Allied Health Literature), PsycINFO (Psychological Information), Embase, Scopus, and Web of Science. The search was confined to studies published in the last ten years (2014-2024).

Inclusion criteria for the review required the studies to be peer-reviewed research such as randomized controlled trials (RCTs), cohort studies, case-control studies, cross-sectional studies, systematic reviews, and meta-analyses. The population focused on adults diagnosed with any type of cancer at any stage of survivorship post initial treatment. The outcome measures included studies assessing the prevalence, causes, or effects of kinesiophobia in cancer survivors. Only studies published in English and available in full-text were considered. The studies had to be published within a specified timeframe of ten years.

Exclusion criteria were set to filter out studies focusing on pediatric cancer patients or non-cancer populations, articles not available in English, studies lacking relevant outcome measures related to kinesiophobia in cancer survivors, case reports, editorials, letters, and conference abstracts without full-text availability, duplicate studies or redundant data from multiple publications by the same authors or research groups, studies with inadequate methodological quality or insufficient data to extract relevant information, and interventions unrelated to kinesiophobia assessment, management, or understanding in cancer survivors.

The study adhered to a systematic approach following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines and the Peer Review of Electronic Search Strategies (PRESS) for electronic database searches. The procedure began with a comprehensive search of electronic databases such as PubMed, MEDLINE, Embase, PsycINFO, and Cochrane Library, using predefined search terms and Boolean operators. The search strategy was developed iteratively in consultation with a medical librarian to ensure inclusivity and accuracy. Search terms encompassed variations and synonyms related to "Kinesiophobia," "Cancer Survivors," and relevant descriptors.

Inclusion criteria were applied to screen titles and abstracts, followed by a full-text review of potentially relevant articles. Any discrepancies in the screening process were resolved through discussion and consensus among the research team. Studies meeting the inclusion criteria underwent data extraction using a standardized form to capture relevant information, including study characteristics, participant demographics, outcome measures, and key findings.

The methodological quality of included studies was assessed using the Pedro Scale, which evaluates the quality of randomized controlled trials, cohort studies, and case-control studies based on specific criteria such as randomization, blinding, and follow-up rates. Studies were

assigned a score based on the scale, with higher scores indicating better methodological quality. Data synthesis involved a narrative summary of findings, organized according to key themes and outcomes related to kinesiophobia in cancer survivors. Additionally, where feasible, meta-analysis was conducted to quantify the overall prevalence or effect size of kinesiophobia and its impact on survivorship outcomes.

DISCUSSION

The current systematic review aimed to develop a comprehensive framework for reporting kinesiophobia among cancer survivors. By synthesizing data from recent studies, we aimed to identify patterns, trends, and gaps in the literature regarding kinesiophobia and its impact on various outcomes in cancer survivors. The studies included in this review spanned different types of cancer, patient demographics, and interventions, providing a broad perspective on the issue.

Impact of Kinesiophobia on Physical Activity and Self-Care

Kinesiophobia significantly impacts physical activity and self-care behaviors in cancer survivors. Wang & Du (2024) demonstrated that kinesiophobia negatively affects self-care and exercise compliance, which in turn impacts the quality of life. Similarly, Marques et al. (2022) found that breast cancer survivors with higher kinesiophobia levels had lower functional performance and muscle strength. These findings underscore the need for interventions that not only encourage physical activity but also address the psychological barriers preventing it.

Psychological Predictors and Correlates of Kinesiophobia

Psychological factors play a crucial role in the development and maintenance of kinesiophobia. Glare et al. (2022) identified maladaptive pain cognitions, such as low self-efficacy and high catastrophizing, as significant contributors to pain-related distress and disability. These cognitive factors are often influenced by pre-existing anxiety and depression, which were also found to correlate with higher kinesiophobia levels. Additionally, Wang & Qiu (2021) highlighted the role of exercise habits, pain, and foreign body sensation in influencing kinesiophobia, suggesting that psychological and sensory experiences are deeply intertwined in these patients.

Relationship with Comorbidities and Demographic Factors

Certain demographic factors and comorbidities are associated with higher levels of kinesiophobia. Malchrowicz-Moško (2022) reported that older age, obesity, and diabetes were associated with increased kinesiophobia in breast cancer survivors. Similarly, Knapik&Nierwińska (2023) found that pain and low psychological well-being were significant predictors of kinesiophobia among women post-mastectomy. These findings suggest that older, obese patients with additional comorbidities may require more tailored and comprehensive interventions to manage kinesiophobia effectively.

Impact on Quality of Life and Functional Outcomes

Kinesiophobia has a profound impact on the quality of life and functional outcomes in cancer survivors. Abakay et al. (2023) demonstrated that lymphedema severity was associated with increased kinesiophobia, which in turn negatively affected pelvic floor function and body image. Similarly, Aydin Sayilan et al. (2021) found significant correlations between kinesiophobia, pain, mobility, and functional status in older adults post-surgery. These studies highlight the detrimental effects of kinesiophobia on both physical and psychological aspects of cancer survivors' lives.

Interventions and Rehabilitation

Effective interventions and rehabilitation programs can help mitigate the impact of kinesiophobia. Gutiérrez-Sánchez et al. (2022) showed that a 12-week therapeutic exercise program significantly improved central sensitization symptoms and showed a trend towards reducing fear avoidance behaviors. This supports the potential of structured exercise programs to alleviate kinesiophobia and its associated symptoms. Furthermore, Malchrowicz-Moško et al. (2023) emphasized the importance of increasing awareness and education about physical activity recommendations to reduce kinesiophobia in breast cancer patients.

Framework for Reporting Kinesiophobia

Based on the synthesis of these studies, we propose a framework for reporting kinesiophobia among cancer survivors. This framework includes the following components:

1. **Assessment of Psychological Factors:** Regular assessment of anxiety, depression, and pain catastrophizing using validated tools to identify patients at risk of kinesiophobia.
2. **Evaluation of Physical Activity and Self-Care Behaviors:** Monitoring physical activity levels and self-care practices to understand the impact of kinesiophobia on these behaviors.
3. **Identification of Comorbidities and Demographic Risk Factors:** Recognizing older age, obesity, diabetes, and other comorbidities as risk factors for kinesiophobia.
4. **Impact on Quality of Life and Functional Outcomes:** Measuring the effects of kinesiophobia on quality of life, functional performance, and specific physical functions such as mobility and upper extremity function.
5. **Intervention and Education Programs:** Implementing structured therapeutic exercise and educational programs to address both physical and psychological aspects of kinesiophobia.

CONCLUSION

The findings from this systematic review highlight the multifaceted nature of kinesiophobia in cancer survivors. Addressing kinesiophobia requires a comprehensive approach that includes psychological assessment, targeted interventions, and patient education. By implementing the proposed framework, healthcare providers can better identify and manage kinesiophobia, ultimately improving the quality of life and rehabilitation outcomes for cancer survivors. This framework aims to provide a structured and evidence-based approach to understanding and addressing the impact of kinesiophobia in this population.

REFERENCES

- Brewer, B. W., Raalte, J. L., & Cornelius, A. E. (2021). An interactive cognitive-behavioural multimedia program favourably affects pain and kinesiophobia during rehabilitation after anterior cruciate ligament surgery: an effectiveness trial. *Int J Sport Exerc Psychol.*, 1.
- Cai, L., Gao, H., Xu, H., Wang, Y., Lyu, P., & Liu, Y. (2018). Does a program based on cognitive behavioral therapy affect kinesiophobia in patients following total knee arthroplasty? A randomized, controlled trial with a 6-month follow-up. *J Arthroplast*, 33.
- Flanigan, D. C., Everhart, J. S., Pedroza, A., Smith, T., & Kaeding, C. C. (2013). Fear of reinjury (kinesiophobia) and persistent knee symptoms are common factors for lack of return to sport after anterior cruciate ligament reconstruction. *Arthroscopy*, 29.
- George, S. Z., Fritz, J. M., & Childs, J. D. (2008). Investigation of elevated fear-avoidance beliefs for patients with low back pain: a secondary analysis involving patients enrolled in physical therapy clinical trials. *J Orthop Sport PhysTher*, 38.
- George, S. Z., Lentz, T. A., Zeppieri, G., Lee, D., & Chmielewski, T. L. (2012). Analysis of shortened versions of the Tampa scale for kinesiophobia and pain catastrophizing scale for patients after anterior cruciate ligament reconstruction. *Clin J Pain*, 28.
- Gholami, M., Kamali, F., Mirzeai, M., Motealleh, A., & Shamsi, M. (2020). Effects of kinesio tape on kinesiophobia, balance and functional performance of athletes with post anterior cruciate ligament reconstruction: a pilot clinical trial. *BMC Sports Sci Med Rehabil*, 12.
- Harput, G., Ulusoy, B., Ozer, H., Baltaci, G., & Richards, J. (2016). External supports improve knee performance in anterior cruciate ligament reconstructed individuals with higher kinesiophobia levels. *Knee*, 23.
- Hart, H. F., Collins, N. J., Ackland, D. C., & Crossley, K. M. (2015). Is impaired knee confidence related to worse kinesiophobia, symptoms, and physical function in people with knee osteoarthritis after anterior cruciate ligament reconstruction? *J Sci Med Sport*, 18.
- Luc-Harkey, B. A., Franz, J. R., Losina, E., & Pietrosimone, B. (2018). Association between kinesiophobia and walking gait characteristics in physically active individuals with anterior cruciate ligament reconstruction. *Gait Posture*, 64.

- Mansfield, C. B., & Selhorst, M. (2018). The effects of fear-avoidance beliefs on anterior knee pain and physical therapy visit count for young individuals: a retrospective study. *PhysTher Sport*, 34.
- Norte, G. E., Solaas, H., Saliba, S. A., Goetschius, J., Slater, L. V., & Hart, J. M. (2019). The relationships between kinesiophobia and clinical outcomes after ACL reconstruction differ by self-reported physical activity engagement. *PhysTher Sport*, 40.
- Priore, L. B., Lack, S., Garcia, C., Azevedo, F. M., & Oliveira, S. D. (2020). Two weeks of wearing a knee brace compared with minimal intervention on kinesiophobia at 2 and 6 weeks in people with patellofemoral pain: a randomized controlled trial. *Arch Phys Med Rehabil*, 101.
- Sonesson, S., Kvist, J., Ardern, C., Österberg, A., & Silbernagel, K. G. (2017). Psychological factors are important to return to pre-injury sport activity after anterior cruciate ligament reconstruction: expect and motivate to satisfy. *Knee Surg Sport TraumatolArthrosc*, 25.
- Tajdini, H., Letafatkar, A., Brewer, B. W., & Hosseinzadeh, M. (2021). Association between kinesiophobia and gait asymmetry after ACL reconstruction: implications for prevention of reinjury. *Int J Environ Res Public Health*, 18.
- Theunissen, W., Steen, M. C., Liu, W. Y., & Janssen, R. P. A. (2020). Timing of anterior cruciate ligament reconstruction and preoperative pain are important predictors for postoperative kinesiophobia. *Knee Surg Sports TraumatolArthrosc*, 28.
- Tichonova, A., Rimdeikienė, I., Petruševičienė, D., & Lendraitienė, E. (2016). The relationship between pain catastrophizing, kinesiophobia and subjective knee function during rehabilitation following anterior cruciate ligament reconstruction and meniscectomy: a pilot study. *Medicina*, 52.
- Wang, Q., & Du, N. (2024). Relationship between kinesiophobia and quality of life among patients with breast cancer-related lymphedema: Chain-mediating effect of self-care and functional exercise compliance. *Asia-Pacific Journal of Oncology Nursing*, 11(1).
<https://doi.org/10.1016/j.apjon.2023.100346>
- Wyngaarden, J. J., Jacobs, C., Thompson, K., Eads, M., Johnson, D., & Ireland, M. L. (2021). Quadriceps strength and kinesiophobia predict long-term function after ACL reconstruction: a cross-sectional pilot study. *Sports Health*, 13.

Table no – 1 Systemic review tables

Author(s) & Year	Participants	Intervention	Measured Outcomes	Significant Findings
Wang & Du (2024)(Wang & Du, 2024)	274 female breast cancer patients with lymphedema, mean age 48.76 years	Cross-sectional study exploring the association between kinesiophobia and QoL with mediation by self-care and functional exercise compliance	Tampa Scale for Kinesiophobia (TSK-11), Appraisal of Self-Care Agency Scale-Revised, Postoperative Functional Exercise Adherence Scale, FACT-Bv4.0	Kinesiophobia negatively associated with self-care ($P < 0.001$), functional exercise compliance ($P < 0.001$), and QoL ($P < 0.001$). Self-care and exercise compliance mediated the effect of kinesiophobia on QoL.
Knapik&Nierwińska (2023)(Knapik A, 2023)	249 women after mastectomy, aged 33-75	Cross-sectional study investigating kinesiophobia, physical activity, and its determinants	Polish version of the Tampa Scale for Kinesiophobia (TSK), self-assessment of physical activity, comorbidity assessment	Kinesiophobia affected over 46% of respondents. Significant predictors of kinesiophobia were pain, low physical activity, and low psychological well-being.
Abakay et al. (2023)(Abakay et al., 2023)	103 patients with gynecological cancer, 52 with lymphedema and 51	Cross-sectional study evaluating the relationship between lower extremity lymphedema and	Gynecologic Cancer Lymphedema Questionnaire (GCLQ), Global Pelvic Floor	Lymphedema severity significantly associated with worse pelvic floor symptoms, increased kinesiophobia, and negative body image.

	without, ages 25-75	pelvic floor functions, sleep quality, kinesiophobia, body image	Bother Questionnaire (GPFBQ), Pittsburgh Sleep Quality Index (PSQI), Tampa Scale of Kinesiophobia (TSK), Body Image Scale (BIS)	No significant difference in sleep quality between groups.
Malchrowicz-Moško et al. (2023)(Malchrowicz-Moško et al., 2023)	285 women (132 breast cancer patients and 153 healthy controls)	Cross-sectional study investigating kinesiophobia in breast cancer patients undergoing surgical treatment	Polish adaptation of the Tampa Scale of Kinesiophobia (TSK)	Approximately 3/4 of women with BC did not know WHO PA recommendations. High levels of kinesiophobia observed, particularly in less advanced stages of BC. No significant differences in kinesiophobia levels based on BC type.
Glare et al. (2022)(Glare et al., 2022)	176 cancer survivors referred to an Australian pain clinic, average age 63 years, 55% female	Retrospective chart review assessing psychosocial characteristics of chronic pain in cancer survivors	Brief Pain Inventory (BPI), Depression Anxiety Stress Scale (DASS), Pain Self-Efficacy Questionnaire (PSEQ), Pain Catastrophizing Scale (PCS)	Chronic pain related to cancer treatment was found in 34% of patients. Pain-related distress and disability were linked to maladaptive pain cognitions (low self-efficacy, high catastrophizing),

				influenced by pre-existing anxiety and depression.
Gutiérrez-Sánchez et al. (2022)(Gutiérrez-Sánchez et al., 2022)	82 female breast cancer survivors, mean age 51.4 years, 2.7 years from diagnosis	12-week therapeutic exercise and educational program, 1 hour twice a week	Central Sensitization Inventory (CSI), Fear Avoidance Components Scale (FACS)	Significant improvement in central sensitization symptoms ($p = .007$) and a trend towards improvement in fear avoidance ($p = .062$). There was a significant correlation between pain-related fear avoidance and central sensitization symptoms ($r = 0.536$, $p < .001$).
Marques et al. (2022)(Alves Marques et al., 2022)	62 women: 32 breast cancer survivors (BCS) (mean age 52.93) and 30 control group (CNT) (mean age 52.16)	Cross-sectional study evaluating functional performance, kinesiophobia, muscle strength, quality of life, and fatigue	Disabilities of the Arm, Shoulder, and Hand (DASH), Tampa Scale for Kinesiophobia, EORTC BR-23, FACT B+4, handgrip test, bilateral isometric strength (BIS), 1RM test	BCS group showed lower functional performance, muscle strength, and higher kinesiophobia levels compared to CNT. Significant negative correlation between BIS and kinesiophobia ($r=-0.295$, $p=0.019$). Functional performance negatively correlated with fatigue ($r=-0.435$, $p=0.0004$) and quality of life ($r=-0.296$,

				p=0.019).
Malchrowicz-Moško (2022)(Malchrowicz-Moško, 2022)	138 Polish women after BC, age 46.5 ± 9.2 , BMI 24.6 ± 4.0	Cross-sectional study investigating kinesiophobia, lifestyle, and comorbidities one year post-treatment	Tampa Scale of Kinesiophobia (TSK), demographic survey, comorbidity assessment	Significant levels of kinesiophobia (pain 41.3 ± 6.2 ; fatigue 41.2 ± 6.2). Higher kinesiophobia in women who were not physically active before diagnosis. Older age, obesity, and diabetes associated with higher kinesiophobia.
Wang & Qiu (2021)(Wang xu zhou yi ke da xue & Qiu, 2021)	282 cancer patients with implanted ports, aged 18+	Cross-sectional survey investigating kinesiophobia and related factors	Tampa Scale of Kinesiophobia-11 (TSK-11), self-made general information questionnaire	45.7% reported some degree of kinesiophobia, 18.4% had moderate to severe kinesiophobia. Exercise habits, pain, and foreign body sensation were significant factors influencing kinesiophobia.
Aydin Sayilan et al. (2021)(Sayilan et al., 2022)	99 older adults (61 females, 38 males), hospitalized after surgery in general surgery clinic	Comparative-descriptive and cross-sectional study investigating relationships among kinesiophobia,	Visual Analogue Scale (VAS), Standardized Mini-Mental State Examination (SMMSE), Functional	Significant negative correlation between social security and kinesiophobia, and between functional level and type of anesthesia and mental

		pain, mobility, and functional status	Independence Measure (FIM), Rivermead Mobility Index (RMI), Tampa Scale for Kinesiophobia (TSK)	status in older women. Significant positive correlation between mobility and mental status.
Elien Van der Gucht et al. (2020)(Van der Gucht et al., 2020)	70 female breast cancer survivors, mean age 59.3 years, 4.5 years post-surgery	Cross-sectional study evaluating pain-related factors, psychosocial factors, and fatigue	Pain Disability Index (PDI), Visual Analog Scale (VAS), Central Sensitization Inventory (CSI), Pain Catastrophizing Scale (PCS), Tampa Scale for Kinesiophobia (TSK), Revised Illness Perception Questionnaire (IPQ-R), EORTC QLQ-C30	Kinesiophobia emerged as the main contributor to pain-related disability. Up to 40% of the variance in pain-related disability could be explained by kinesiophobia, negative illness perceptions, and pain catastrophizing.
Gencay Can et al. (2019)(Can et al., 2019)	81 breast cancer survivors, mean age 54.1 years, range 44-70 years	Cross-sectional study investigating lymphedema, upper extremity function,	Tampa Scale for Kinesiophobia (TSK), Quick Disabilities of the Arm, Shoulder, and Hand (Q-DASH), Hospital	Higher rates of lymphedema and kinesiophobia observed. Kinesiophobia associated with increased

		depression, anxiety, and quality of life	Anxiety and Depression Scale (HADS), Short Form-36 (SF-36)	depression/anxiety and decreased upper extremity function and physical quality of life.
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Part 1 - PEDro Scores Table

Author(s) & Year	Eligibility Criteria	Random Allocation	Concealed Allocation	Baseline Comparability	Blind Subjects	Blind Therapists	Blind Assessors	Adequate Follow-up	Intention-to-treat	Between-group Comparisons	Point Estimates and Variability	Total Score
Wang & Du (2024)	Yes	No	No	Yes	No	No	No	Yes	No	Yes	Yes	4
Knapik&Nierwińska (2023)	Yes	No	No	Yes	No	No	No	Yes	No	Yes	Yes	4
Abakay et al. (2023)	Yes	No	No	Yes	No	No	No	Yes	No	Yes	Yes	4
Malchrowicz-Moško et al. (2023)	Yes	No	No	Yes	No	No	No	Yes	No	Yes	Yes	4
Glare et al. (2022)	Yes	No	No	Yes	No	No	No	Yes	No	Yes	Yes	4

Part 2 - PEDro Scores Table

Author(s) & Year	Eligibility Criteria	Random Allocation	Concealed Allocation	Baseline Comparability	Blind Subjects	Blind Therapists	Blind Assessors	Adequate Follow-up	Intention-to-treat	Between-group Comparisons	Point Estimates and Variability	Total Score
Gutiérrez-Sánchez et al. (2022)	Yes	No	No	Yes	No	No	No	Yes	No	Yes	Yes	4
Marques et al. (2022)	Yes	No	No	Yes	No	No	No	Yes	No	Yes	Yes	4

Malchrowicz-Moško (2022)	Yes	No	No	Yes	No	No	No	Yes	No	Yes	Yes	4
Wang & Qiu (2021)	Yes	No	No	Yes	No	No	No	Yes	No	Yes	Yes	4
Aydin Sayilan et al. (2021)	Yes	No	No	Yes	No	No	No	Yes	No	Yes	Yes	4

Author(s) & Year	Eligibility Criteria	Random Allocation	Concealed Allocation	Baseline Comparability	Blind Subjects	Blind Therapists	Blind Assessors	Adequate Follow-up	Intention-to-treat	Between-group Comparisons	Point Estimates and Variability	Total Score
Elien Van der Gucht et al. (2020)	Yes	No	No	Yes	No	No	No	Yes	No	Yes	Yes	4
Gencay Can et al. (2019)	Yes	No	No	Yes	No	No	No	Yes	No	Yes	Yes	4