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Research Article

THE EFFECT OF KINESIOPHOBIA ON QUALITY OF LIFE IN HAEMODIALYSIS PATIENTS

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Abstract: *This study was conducted to determine the level of kinesiophobia in patients undergoing haemodialysis (HD) treatment and to evaluate the effect of this level on their quality of life. The study was conducted with 86 patients aged 18–65 years who were receiving regular HD treatment for at least 3 months at private dialysis centres and who were not in the acute phase. Data collection tools included a personal information form, the Tampa Kinesiophobia Scale (TKS), and the SF-36 Quality of Life Scale. Statistical analyses were performed using SPSS 26.0, including multiple regression, correlation analyses, and power analyses. The average age of participants was 60.2, and 51.2% were female. The average kinesiophobia score of participants was 52.72, indicating that fear of movement was prevalent. A significant negative relationship was found between kinesiophobia level and physical activity ($r = -0.411$, $p<0.001$) and participation in sports ($r = -0.345$, $p<0.01$). Economic status was the only sociodemographic variable significantly and negatively associated with kinesiophobia ($r = -0.304$, $p < 0.01$). According to multiple regression analysis, the 'Role-Physical' (RP) level of the SF-36 subdimensions significantly predicted kinesiophobia in a negative direction ($B = –0.00268$, $p <0.05$), while the 'Vitality' level is a significant positive predictor ($B = 0.00889$, $p <0.01$). An increase in the RP level, i.e., a decrease in physical role limitations, contributes to a decrease in kinesiophobia levels. High levels of kinesiophobia in HD patients can negatively affect their quality of life in many ways.*

Keywords*: Haemodialysis, Kinesiophobia, Quality of Life, Kidney Failure, Patient*

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1. Introduction

Haemodialysis (HD), one of the treatment options for renal failure, is a renal replacement therapy in which fluid and substance exchange between blood and dialysis solution is achieved through a semipermeable coil membrane. Common clinical issues encountered in patients during or after HD include hypotension, nausea, dizziness, fatigue, sleep disorders, musculoskeletal pain, itching, dry skin, emotional problems, and sexual dysfunction [1-4].

A large proportion of HD patients undergo invasive surgical procedures such as fistula creation, and often experience pain during or after the procedure, particularly in the fistula-bearing arm [5]. The literature indicates that the amygdala region of the human brain stores painful memories for long periods of time, and that this triggers avoidance behaviours in individuals to prevent the recurrence of similar pain [6]. As a result, a decrease in motivation for physical activities is observed in individuals, and this situation can often evolve into a fear of movement, defined as 'kinesiophobia.'

The concept of kinesiophobia was first defined by Kori and colleagues in 1990 and is considered a behaviour of avoidance of movement, especially after traumatic physical injuries, back or knee pain [7]. A review of the literature indicates that painful experiences associated with movement can cause lasting fears in individuals, which can lead to physical limitations and disability over time. [8-10].

Quality of life encompasses multidimensional concepts such as an individual's ability to meet their basic needs, derive satisfaction from life, maintain their social roles, participate in leisure activities, and maintain adequate emotional and physical health [11]. Studies have shown that physical inactivity in HD patients leads to a significant decline in quality of life and an increase in mortality rates [12]. Additionally, it is noted that insufficient physical activity levels are associated with muscle strength loss, sarcopenia, and difficulty in daily living activities, and that this situation significantly affects quality of life [13].

While there are many studies on quality of life in HD patients, the number of studies directly related to kinesiophobia is quite limited. Symptoms such as fatigue, dizziness, and hypotension experienced during the HD process, as well as surgical procedures, the need to protect the fistula and catheter area, may lead to avoidance of movement and, consequently, kinesiophobia. In this context, the present study was designed to assess the level of kinesiophobia in HD patients and to examine the impact of this fear on quality of life.

2. Method

2.1. Research Design

This study is a cross-sectional, single-blind, descriptive research designed to investigate the effect of kinesiophobia on the quality of life of haemodialysis patients. The research is based on the hypothesis that 'The level of kinesiophobia has a negative effect on the quality of life of haemodialysis patients,' and the data was collected using a face-to-face survey method.

2.2. Population and Sample

The population of the study consisted of patients who were not in the acute phase at private HD centres in the vicinity of Silivri district, Istanbul. The study sample consisted of 100 patients who agreed to participate in the data collection process and met the inclusion criteria.

2.2.1 Inclusion and Exclusion Criteria:

The inclusion criteria of the study were being between 18 and 65 years of age, have been undergoing regular HD treatment for at least 3 months, having no serious mobility impairments such as fractures, muscle diseases or paralysis and being conscious and willing to participate in the study.

The exclusion criteria of the study were being an acute or temporary HD patient and having severe mobility restrictions.

2.3. Data Collection Process and Measurement Tools

The study was initiated with 100 patients from a private dialysis centre, and statistical analysis was completed with 86 patients.

2.3.1 Personal Information Form

In the first part of the survey a Personal Information Form was used to collect participants' sociodemographic and disease information.

2.3.2 Tampa Kinesiophobia Scale (TKS)

Developed by Viaeyen et al. (1995) and validated in Turkish by Tunca Yılmaz et al. (2011), it is a four-point Likert-type scale consisting of 17 items. Scores range from 17 to 68; values of 37 and above

are considered risky in terms of kinesiophobia. The Cronbach α value of the scale in this study is 0.86 [14].

2.3.3 SF-36 Health Survey

Developed by Ware and Sherbourne (1992) and validated in Turkish by Koçyiğit and colleagues, this is a short form consisting of eight subscales. Subscale scores range from 0 to 100, with 0 indicating poor health and 100 indicating good health. The Cronbach α value for this scale in this study is 0.74 [15,16].

2.4. Statistical Analysis

The SPSS 26.0 software package was used to analyse the data. The effect of the physical and mental health dimensions of quality of life on kinesiophobia was examined using multiple linear standard regression analysis. Prior to the analysis, the regression assumptions were evaluated as follows. Multicollinearity**:** There is no multicollinearity problem because the VIF values are in the range of 1.32–1.97.

Normality: According to the Shapiro-Wilk test results, the residual values are normally distributed (W = 0.9837; p = 0.3511), which is also supported by the Q-Q plot (Figure 1).

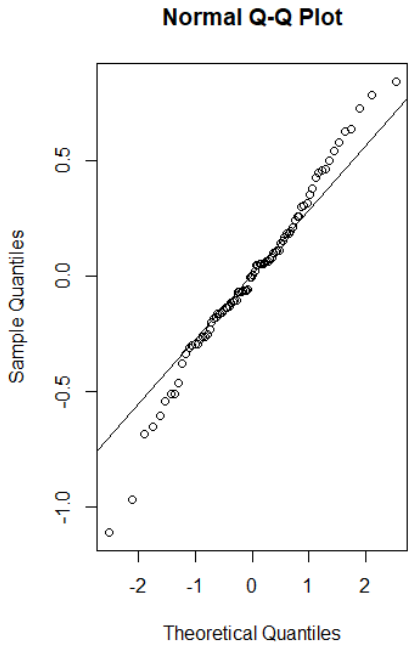

Figure 1. Q-Q Plot

Autocorrelation: Although the Durbin-Watson value of 1.6776 (p = 0.04085) indicates weak positive autocorrelation, it is emphasised that this situation should be interpreted with caution due to the cross-sectional nature of the study.

Homogeneity of Variances: The Breusch-Pagan test (BP = 10.416; df = 8; p = 0.237) indicates that the homogeneity assumption is met.

Effective Observations: In the leverage and residual value analysis, observation number 86 was identified as a potential outlier due to its high leverage and extreme residual value. Observations numbers 19, 21, 23, 46, 53, 60, and 71 were also evaluated as outliers and removed from the analysis to check the robustness of the model.

Power Analysis: The power analysis of the model has achieved a large effect size ($f^2 = 0.57$) and statistical power at the 99.97% level. However, in the approximate power analyses conducted on a variable basis, low power was obtained, particularly for the PF (power = 0.11), RP (power = 0.33) and RE (power = 0.24) variables. This indicates that the effects of these variables on kinesiophobia are of limited reliability due to the sample size. It is recommended that these relationships be re-evaluated in future studies with larger samples.

2.5. Ethical Approval

The study was conducted in accordance with the principles of the Helsinki Declaration. Participants were informed of the purpose of the study, that participation was voluntary, and that the information obtained would be used solely for research purposes. Written consent was obtained from participants; prior to data collection for the research, the necessary permission was obtained from the Istanbul Rumeli University Ethics Committee (Decision No: E-53938333-050-48522 Date: 31.01.2025).

3. Results

The findings of the present study were examined under two main headings: 'The effect of sociodemographic and disease characteristics on kinesiophobia' and 'The effect of kinesiophobia on quality of life.'

3.1. The Relationship between Sociodemographic and Disease Characteristics on Kinesiophobia

3.1.1 Sociodemographic Status

The relationship between sociodemographic characteristics of participants and kinesiophobia was examined. A total of 86 participants were included in the study. 51.2% (n=44) of the participants were female, and 48.8% (n=42) were male. The age range was 23–88 years, with an average age of 60.2 years. This indicates that the sample was concentrated in the older age group.

Table 1. Sociodemographic Characteristics of Participants (N=86)

Variable	Category	n (%)
Gender	Woman	44 (51.2)
	Men	42 (48.8)
Age (years)	Mean (Mean±SD)	60.2
Marital Status	Married	54 (62.8)
	Single	4 (4.7)
	Widowed	28 (32.6)
Employment Status	Employed	21 (24.4)
	Unemployed	65 (75.6)
Economic Status	Good	2 (2.3)
	Average	45 (52.3)
	Poor	39 (45.3)

When examining marital status, 62.8% (n=54) of participants were married, 32.6% (n=28) were widowed, and 4.7% (n=4) were single. 24.4% (n=21) of participants were employed, while 75.6% (n=65) were unemployed. When their economic status was evaluated, 52.3% (n=45) reported their economic status as 'average,' 45.3% (n=39) as 'poor,' and 2.3% (n=2) as 'good.' These results indicate that the socio-economic level of the sample is generally average or low (Table 1).

3.1.2 Disease Status of the participants

Participants' dialysis durations, and the reasons for starting dialysis were examined and the results are shown in Table 2.

Table 2. Participants' Medical Information

Dialysis Duration (Months)	
Minimum-Maximum	3-144
Mean±SD	46.7±34.8
Reasons for Starting Dialysis	**n (%)**
Kidney Stones and Infections	22 (25.6)
Diabetes	18 (20.9)
Unknown Cause	9 (10.5)
Kidney Tumours and Cysts	8 (9.3)
Hypertension	7 (8.1)
Syndromes	1 (1.2)
Issues Before Dialysis	
Problem	**n (%)**
Fatigue	39 (45.3)
Hyper/hypotension	16 (18.6)
Other issues	13 (15.1)
No issues	18 (20.9)
Post-Dialysis Problems	
Problem	n (%)
Fatigue	43 (50.0)
Hyper/hypotension	24 (27.9)
Other issues	12 (14.0)
No issues	7 (8.1)
Problems Between Sessions	
Problem	**n (%)**
Fatigue	36 (41.9)
Hyper/hypotension	8 (9.3)
Other issues	17 (19.8)
No issues	25 (29.1)
Chronic Disease Burden	
Illness	**n(%)**
Hypertension	30 (34.9)
Diabetes	28 (32.6)
Cerebrovascular disease. Alzheimer's disease	3 (3.5)
Lung disease	1 (1.2)
None	24 (27.9)

Participants' dialysis durations ranged from 3 to 144 months, with an average dialysis duration of 46.7±34.8 months. When looking at the reasons for starting dialysis, the most common reasons were kidney stones/infections (25.6%) and diabetes (20.9%). Before dialysis, after dialysis, and between two dialysis sessions, patients reported that the first two problems they experienced were fatigue and

fluctuations in hypotension-hypertension at varying times during the day. It has been observed that the most common chronic diseases in haemodialysis patients are hypertension (34,9) and diabetes (32,6) (Table 2).

3.1.3 Level of Kinesiophobia

The average level of kinesiophobia among participants was found to be 52.72 (min=30, max=68).

3.1.4 Relationship between Sociodemographic Characteristics and Kinesiophobia

According to the Pearson correlation analysis conducted with the kinesiophobia level, only the economic status variable ($r = –0.304$, $p<0.05$) was found to have a statistically significant and negative relationship.. This result suggests that patients with poor economic status may have higher levels of kinesiophobia. No significant relationship was found between age, gender, marital status, number of children, dialysis duration, and employment status and kinesiophobia ($p > 0.05$).

3.1.5 Kinesiophobia and Physical Activity Status

Significant negative correlations were found between kinesiophobia and levels of physical activity ($r = –0.411$, $p < 0.001$) and sport ($r = –0.345$, $p <0.01$). This finding indicates that physical activity and sport are important variables that reduce kinesiophobia.

Other variables (desire for more activity, general condition) did not show a significant relationship with kinesiophobia ($p > 0.05$).

3.2. The Effect of Kinesiophobia on Quality of Life

The relationship between kinesiophobia levels and SF-36 quality of life subdimensions was examined using multiple regression analysis, and it was observed that the explanatory power of the model increased when outliers were removed from the data set ($R^2 = 0.36$, Adjusted $R^2 = 0.28$; RMSE = 0.277). The Corrected AICc (Akaike Information Criterion) and BIC (Bayesian Information Criterion) weights of the cleaned model were found to be 100%, demonstrating that removing outliers improved model fit.

As the Role-Physical level increases, the level of kinesiophobia decreases significantly ($B = –0.00268$, $p<0.05$). This indicates that individuals with lower physical role limitations have lower levels of kinesiophobia. The Vitality (VT) variable is significantly positively associated with kinesiophobia ($B = 0.00889$, $p<0.01$). Paradoxically, individuals with higher vitality have higher levels of kinesiophobia. The Role-Emotional (RE) and Social Functioning (SF) variables were found to have a marginally significant ($p \approx 0.07–0.08$) positive relationship with kinesiophobia. The variables Physical Functioning (PF), Mental Health (MH), Bodily Pain (BP), and General Health (GH) were not found to have a significant relationship with kinesiophobia ($p > 0.05$) (Table 3).

Table 3. Regression Results of SF-36 Subdimensions Affecting Kinesiophobia

Variable	Coefficients	Standart Error	t Stat	P-value	Lower %2.50	Upper %97.50
(Intercept)	2.04006	0.277	7.377	0.00 ***	1.488	2.593
PF	0.00221	0.002	1.026	0.309	–0.0021	0.00651
RP	–0.00268	0.0012	–2.179	0.03 *	–0.0051	–0.00022
RE	0.00234	0.0013	1.788	0.08.	–0.0003	0.00496
VT	0.00889	0.0031	2.873	0.00 **	0.0027	0.01508

Table 3. Continued.

Variable	Coefficients	Standart Error	t Stat	P-value	Lower %2.50	Upper %97.50
MH	0.00294	0.0032	0.926	0.358	–0.0034	0.00929
SF	0.00463	0.0026	1.815	0.07.	–0.00047	0.00972
BP	–0.00054	0.0025	–0.215	0.830	–0.0056	0.00448
GH	–0.00209	0.0024	–0.863	0.391	–0.0069	0.00275

Note: PF : Physical Functional, RP : Role-Physical, RE : Role-Emotional, VT: Vitality, MH : Mental Health, SF : Social Function, BP : Bodily Pain, GH: General Health. ***:p<0.001; **:p<0.01; *:p<0.01

In the multiple regression analysis conducted in the study, it was found that Role-Physical scores from the SF-36 quality of life subdimensions negatively and significantly predicted kinesiophobia levels. This finding indicates that physical functional loss and health-related role limitations are associated with kinesiophobia. However, the finding that the Vitality subscale positively predicts kinesiophobia is noteworthy. It can be argued that even individuals with high energy levels may experience fear of movement and may experience a more intense a fear of losing their physical function.

The marginal significance of the Role-Emotional and Social Functioning subscales also indicates that kinesiophobia has not only physical but also psychosocial dimensions. The fact that the Mental Health, Bodily Pain, Physical Functioning and General Health subscales do not show a significant relationship with kinesiophobia suggests that these dimensions play a limited role in explaining fear of movement. Additionally, the Role-Physical and Vitality subscales of the SF-36 were found to be important predictors of kinesiophobia. Our findings show that kinesiophobia levels are more closely related to economic status and physical activity levels than to basic sociodemographic variables.

These results indicate that rehabilitation and health services aimed at reducing kinesiophobia should be planned in a manner that is consistent not only with physical and emotional factors but also with the individual's socioeconomic conditions. Future studies are recommended to conduct longitudinal analyses with larger samples.

4. Discussion

This study examined the effect of sociodemographic and clinical characteristics on the level of kinesiophobia in HD patients and the effect of kinesiophobia on quality of life. The findings revealed that the level of kinesiophobia in HD patients was significantly associated with socioeconomic status and physical activity, and that certain subdimensions of quality of life showed statistically significant correlations with kinesiophobia. The Vitality (VT) variable is significantly positively associated with kinesiophobia. The reason for this is that individuals with chronic illness can maintain their psychological vitality to a certain extent through their efforts to survive, maintain a sense of control, preserve their will to live, and participate in life again [17]. The literature reports that the level of denial is positively associated with sub-dimensions of quality of life such as symptom burden, impact of illness, and cognitive functioning. Furthermore, it has been demonstrated that the denial mechanism can function as an adaptive coping strategy under certain conditions in individuals diagnosed with chronic kidney disease and can contribute to maintaining quality of life [18].

A review of the literature supports the view that invasive surgical procedures undergone by HD patients, a tendency to protect the fistulated extremity and catheter, or symptoms such as dizziness, hypotension, and fatigue that arise during physical activity may contribute to the development of kinesiophobia [5,19].

Indeed, in a study conducted by Demir and Yıldız (2018), it was reported that 83.5% of HD patients experienced fatigue, 74.7% experienced muscle cramps, and 73.7% experienced bone and joint

pain [20]. The findings of the current study are consistent with these data; 50% of the participants in the study reported fatigue as the most common symptom. The frequent occurrence of such symptoms significantly negatively affects individuals' quality of life [21,22].

The study found that the prevalence of kinesiophobia was 52.7%, indicating that moderate to high levels of movement fear are common among HD patients. This finding is consistent with the high prevalence rates reported in previous studies. For example, Deshmukh and Pawar (2024) reported a prevalence of kinesiophobia of 90.5% in HD patients and indicated that it showed a significant positive correlation with the risk of falling [23]. Similarly, Xie and colleagues (2024) reported a prevalence of kinesiophobia of 69.1% in patients undergoing peritoneal dialysis in a multicentre, cross-sectional study; fatigue and negative coping styles were identified as important risk factors. 6 In the current study, the mean kinesiophobia score was calculated as 52.72 (min: 30 – max: 68); this result, which exceeds the cutoff point of 37, indicates a high level of fear of movement in HD patients. Fatigue was the most commonly reported symptom both before and after dialysis (50%) and emerged as one of the primary symptoms associated with kinesiophobia levels.

When examining the relationship between demographic characteristics and kinesiophobia levels, no significant association was found with variables such as age, gender, marital status, number of children, and dialysis duration. However, a significant and negative correlation was found between economic status and kinesiophobia level. This suggests that fear of movement may be more pronounced in individuals with lower socioeconomic status.

Negative and significant correlations were found between kinesiophobia and levels of physical activity and participation in sports. Decreased physical activity leads to a decline in quality of life in HD patients, while avoidance of movement reinforces this cycle.

In another study conducted by Katayıfçı and colleagues (2024), functional exercise capacity, muscle strength, balance, and kinesiophobia levels were assessed in individuals diagnosed with chronic kidney disease; significant relationships were found between kinesiophobia and physical performance indicators [24]. The findings of the current study are also consistent with this; a significant and negative relationship was identified between increased physical activity levels and kinesiophobia levels.

In a systematic review conducted by Wlazło and colleagues (2025), the effects of kinesiophobia on physical activity and quality of life in chronic diseases were evaluated; it was reported that fear of movement reduces physical activity levels and negatively affects quality of life [25]. This finding is parallel to the fatigue-based kinesiophobia highlighted in the current study. Similar to fatigue-related movement restrictions observed in individuals with chronic diseases such as heart and lung disease, avoidance behaviours due to symptom severity may also develop in HD patients [26-30]. The current study examined the distribution of comorbid chronic diseases in patients undergoing HD treatment and provided important findings on how this disease burden may affect patients' overall health status and quality of life. According to the findings, 34.9% of participants had hypertension, 32.6% had diabetes, 3.5% had cerebrovascular disease and Alzheimer's diagnosis, and 1.2% had chronic lung disease. On the other hand, 27.9% of participants reported no additional chronic diseases.

The high prevalence of comorbidities in HD patients complicates the health management processes for these individuals. The high prevalence of diabetes and hypertension indicates that these two diseases are among the main etiological factors of chronic kidney disease. This finding is consistent with national and international literature. In particular, diabetic nephropathy and hypertensive nephrosclerosis play a fundamental role in the progression of renal failure [31].

In addition, the presence of neurological disorders such as Cerebrovascular disease and Alzheimer's disease can have adverse effects on cognitive functions, which may limit patients' treatment compliance and self-care skills. However, the low incidence of lung diseases reported may be interpreted as indicating that respiratory comorbidities are less common in the nephrological patient group; however, this also raises the possibility that asymptomatic cases may have been overlooked.

Another noteworthy finding of the current study is that 27.9% of patients reported having no additional chronic diseases. While this indicates that some individuals receive HD treatment solely for kidney disease, it also serves as a warning that hidden or undiagnosed diseases should not be overlooked. Comprehensive assessment methods are important, especially in older individuals, as symptoms may manifest differently.

In analyses evaluating the relationship between kinesiophobia and quality of life subdimensions, a significant and negative relationship was found between physical role limitation and kinesiophobia. This finding suggests that decreases in daily functioning due to health status may increase fear of movement and that individuals' loss of physical independence may elevate their levels of kinesiophobia. On the other hand, the positive relationship between quality of life components such as vitality and social functioning and kinesiophobia may suggest that more active, social, or energetic individuals may express their movement-related anxieties more intensely or that movement is a central part of life for these individuals. The fact that the emotional role limitation and mental health dimensions yielded borderline significant results indicates that kinesiophobia should be considered not only in terms of its physiological aspects but also its psychological and social dimensions.

However, the fact that physical functioning, bodily pain and general health sub-dimensions did not show a significant relationship with kinesiophobia suggests that these variables have a limited effect in explaining fear of movement. In this context, multidisciplinary interventions planned early on, especially in HD patients with high physical role limitations, may contribute to improving quality of life by reducing fear of movement.

The absence of a difference in quality of life between fatigue-related kinesiophobia and physiologically-based kinesiophobia, such as hypotension, is also an important finding. This situation shows that kinesiophobia negatively affects quality of life regardless of its cause.

In conclusion, it is understood that not only biological but also psychosocial factors should be considered in determining the level of kinesiophobia in HD patients. Individuals with low socioeconomic status, high physical role limitations, and low physical activity levels constitute the risk group. It is recommended that interventions aimed at reducing kinesiophobia be prioritised as key areas of intervention for improving quality of life.

The results of the study, when evaluated in terms of nursing practice, indicate that haemodialysis patients should be provided with education and psychosocial support to safely maintain physical activity and reduce fear of movement. Furthermore, comprehensive care programmes aimed at improving patients' quality of life should be developed in collaboration with physiotherapists, psychologists and dieticians. Including kinesiophobia assessment in routine nursing care plans can enhance the effectiveness of the rehabilitation and care process for chronic kidney patients, thereby contributing to the strengthening of holistic care.

5. Conclusion

This study aimed to determine the levels of kinesiophobia in HD patients and to examine its effects on quality of life. The findings showed that kinesiophobia is a common problem in HD patients and that it occurs at higher levels, especially in individuals with low socioeconomic status. Additionally, it was found that an increase in physical activity and sports participation levels was associated with a decrease in kinesiophobia levels, thereby indicating that physical inactivity has negative effects on both movement fear and quality of life.

The ‘Role-Physical’ level, one of the subscales of the SF-36 quality of life scale, was identified as a significant negative predictor of kinesiophobia; this finding indicates that patients with less restricted physical functioning have lower levels of fear of movement. On the other hand, the positive correlation between the ‘Vitality’ level and kinesiophobia indicates that individuals can continue to

avoid movement despite having high energy levels. Additionally, the marginal association between psychosocial factors such as emotional roles and social functioning and kinesiophobia indicates that this condition should be considered not only in terms of its physical components but also its psychological and social components.

In conclusion, kinesiophobia in HD patients should be considered a multidimensional problem. Intervention programmes that comprehensively address physical, psychological, and social factors may reduce fear of movement and improve quality of life. In particular, individualised rehabilitation programmes that encourage physical activity and reduce patients' pain perception and anxiety levels are recommended. Future longitudinal studies with larger sample sizes will contribute to the development of targeted interventions by providing a more detailed understanding of the causes of kinesiophobia.

Ethical Statement:

Written consent was obtained from participants; prior to data collection for the research, the necessary permission was obtained from the Istanbul Rumeli University Ethics Committee (Decision No: E-53938333-050-48522 Date: 31.01.2025).

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Conflict of interest:

No conflicts of interest have been declared by the author(s).

Authors' contributions:

A. N: Conceptualization, Methodology, Formal analysis, Writing - Original draft preparation (%50).

B. C: Conceptualization, Methodology, Resources, Investigation (%30).

A. T: Data collection, statistics (%20).

All authors read and approved the final manuscript.

Generative AI statement:

The authors declare that no Gen AI was used in the creation of this manuscript.

References

[1] Özer, S., *İç Hastalıkları Hemşireliği*, İstanbul Medikal Sağlık ve Yayıncılık, İstanbul, 2019.

[2] Akdemir, N., Birol, L., *İç Hastalıkları ve Hemşirelik Bakımı*, Akademisyen Kitabevi, Ankara, 2020.

[3] Tayaz, E., Koç, A., "Hemodiyaliz tedavisi alan kronik böbrek yetmezliği hastalarında semptom yönetimi ve hemşirelik," *Anadolu Hemşirelik ve Sağlık Bilimleri Dergisi*, 23(1), ss. 147–156, 2020. Doi: 10.17049/ataunihem.441384.

[4] Türker, E., Tanrıkulu, G., Çelikten, Ö., "Hemodiyaliz hastalarında öz bakım gücünün semptom yönetimi ilişkisi üzerine bir araştırma," *Lokman Hekim Tıp Tarihi ve Folklorik Tıp Dergisi*, 12(3), ss. 668–674, 2022. Doi: 10.31020/mutftd.1131345.

[5] Özer, Z., Ateş, S., "Hemodiyaliz hastalarında ağrı ve ağrı yönetimi," *İZÜ Fen Bilimleri Enstitüsü Dergisi*, 2(2), ss. 1–7, 2020. [Online]. Access Date: 03.05.2025 https://dergipark.org.tr/en/pub/izufbed/issue/54470/706259

[6] Xie, M., Yin, L., Guo, Y., Zhang, X., Zhao, R., "Current status and influencing factors of kinesiophobia in patients with peritoneal dialysis: A multicenter cross-sectional study," *BMC Nephrology*, 25(1), 404, 2024. Doi: 10.1186/s12882-024-03851-0.

[7] Kori, S., "Kinesiophobia: A new view of chronic pain behaviour," *Pain Management*, 3, ss. 35–43, 1990. [Online]. Access Date: 13.04.2025 https://ci.nii.ac.jp/naid/10018102845

[8] Cruz-Díaz, D., Romeu, M., Velasco-González, C., Martínez-Amat, A., Hita-Contreras, F., "The effectiveness of 12 weeks of Pilates intervention on disability, pain and kinesiophobia in patients with chronic low back pain: A randomized controlled trial," *Clinical Rehabilitation*, 32(9), ss. 1249–1257, 2018. Doi: 10.1177/0269215518768393.

[9] Domingues de Freitas, C., Costa, D.A., Junior, N.C., Civile, V.T., "Effects of the Pilates method on kinesiophobia associated with chronic non-specific low back pain: Systematic review and meta-analysis," *Journal of Bodywork and Movement Therapies*, 24(3), ss. 300–306, 2020. Doi: 10.1016/j.jbmt.2020.05.005.

[10] Brown, O.S., Hu, L., Demetriou, C., Smith, T.O., Hing, C.B., "The effects of kinesiophobia on outcome following total knee replacement: A systematic review," *Archives of Orthopaedic and Trauma Surgery*, 140(12), ss. 2057–2070, 2020. Doi: 10.1007/s00402-020-03582-5.

[11] Alemdar, H., Çınar Pakyüz, S., "Hemodiyaliz hastalarında öz bakım gücünün yaşam kalitesine etkisinin değerlendirilmesi," *NefroHem Dergisi*, 10(2), ss. 19–30, 2015. [Online]. Access Date: 17.04.2025 https://dergipark.org.tr/tr/pub/hemsire/issue/28578/304864

[12] Király, E., Szőllősi, G.J., Jenei, Z., Kárpáti, I., "Association between physical activity and quality of life in haemodialysed and peritoneal dialyzed patients in Hungary," *Renal Failure*, 46(1), 2324079, 2024. Doi: 10.1080/0886022X.2024.2324079.

[13] Tarca, B., Jesudason, S., Bennett, P.N., Wycherley, T.P., Ferrar, K.E., "Modifiable physical factors that influence physical function for people receiving peritoneal dialysis," *Kidney International Reports*, 9(5), ss. 1298–1309, 2024. Doi: 10.1016/j.ekir.2024.01.057.

[14] Tunca Yılmaz, Ö., Yakut, Y., Uygur, F., Uluğ, N., "Tampa Kinezyofobi Ölçeği'nin Türkçe versiyonu ve test-tekrar test güvenirliği," *Fizyoterapi Rehabilitasyon*, 22(1), ss. 44–49, 2011. [Online]. Access Date: 21.01.2025 https://dergipark.org.tr/en/download/article-file/138103

[15] Ware, J.E. Jr., Sherbourne, C.D., "The MOS 36-item short-form health survey (SF-36): I. Conceptual framework and item selection," *Medical Care*, 30(6), ss. 473–483, 1992. Doi: 10.1097/00005650-199206000-00002.

[16] Koçyiğit, H., Aydemir, Ö., Ölmez, N., Memiş, A., "Kısa form-36 (KF36)'nın Türkçe versiyonunun güvenirliliği ve geçerliliği," *İlaç ve Tedavi Dergisi*, 12(2), ss. 102–106, 1999. [Online]. Access Date: 14.02.2025 https://toad.halileksi.net/olcek/yasam-kalitesi-testi-kisa-form-36/

[17] Roikjaer, S. G., Beck, M., Asgari, N., Skou, S. T., Tang, L. H., & Simonÿ, C., "Navigating loss and growth in chronic illness: An interview study on physical activity and well-being." *Scandinavian Journal of Caring Sciences,* 39,2, 2025. Doi:10.1111/scs.70028

[18] Pugi, D., Ferretti, F., Galeazzi, M., Gualtieri, G., Lorenzi, L., Pappalardo, N., Giuseppe Macrì, P., Garosi, G., Coluccia, A., Pozza, A., "Health-Related Quality of Life in pre-dialysis patients with chronic kidney disease: the role of Big-Five personality traits and illness denial," *BMC Psychol* 10, 297, 2022. Doi:10.1186/s40359-022-00992-5

[19] Güler, S., Terzi, Z., Gündoğan, R., "Hemodiyaliz Hastalarında Yorgunluk, Bakım Bağımlılığı ve Etkileyen Faktörlerin İncelenmesi" *Journal of Nephrology Nursing*, 17(3): 83-93, 2022. Doi: 10.47565/ndthdt.2022.57

[20] Hintistan, S., Deniz, A., "Hemodiyaliz tedavisi alan hastalarda semptom değerlendirmesi," *Bezmialem Science*, 6(2), ss. 112–117, 2018. [Online]. Access Date: 03.02.2025 https://www.bezmialemscience.org/pdf/bd1986e1-0bc1-4f4d-af66-3a184850a065/articles/bs.2018.1530/BAS-6-112.pdf

[21] Sułkowski, L., Matyja, A., Matyja, M., "Fatigue in hemodialysis patients: A comparative analysis with healthy controls," *Eur. J. Investig. Health Psychol, Educ, 15*, 12, 2025. doi:10.3390/ejihpe15020012

[22] Samoudi, A.F., Marzouq, M.K., Samara, A.M., Zyoud, S.H., Al-Jabi, S.W., "The impact of pain on the quality of life of patients with end-stage renal disease undergoing hemodialysis: A multicenter cross-sectional study from Palestine," *Health and Quality of Life Outcomes*, 19(1), 39, 2021. Doi: 10.1186/s12955-021-01686-z.

[23] Deshmukh, M. P., Gohil, D. M., Mathew, N., Narvekar, G., Pacharne, S., Baxi, G., Palekar, T. J., "Prevalence of kinesiophobia in patients on maintenance hemodialysis and its correlation with risk of fall," *Bull. Env. Pharmacol. Life Sci,* 12, 333-337. 2023. [Online]. Access Date: 08.07.2025 https://www.researchgate.net/publication/379309836

[24] Katayıfçı, N., Hüzmeli, İ., İri, Ş.D., Turgut, F.H., "Impairments of functional exercise capacity, muscle strength, balance and kinesiophobia in patients with chronic kidney disease: A cross-sectional study," *BMC Nephrology*, 25(1), 184, 2024. Doi: 10.1186/s12882-024-03610-1.

[25] Wlazło, M., Szlacheta, P., Grajek, M., Staśkiewicz-Bartecka, W., Rozmiarek, M., Malchrowicz-Mośko, E., & Korzonek-Szlacheta, I., "The impact of kinesiophobia on physical activity and quality of life in patients with chronic diseases: A systematic literature review," *Applied Sciences*, 15(4), 2086, 2025. Doi: 10.3390/app15042086.

[26] Baykal Şahin, Ş., Kalaycıoğlu, E., Şahin, M., "The effect of cardiac rehabilitation on kinesiophobia in patients with coronary artery disease," *Turkish Journal of Physical Medicine and Rehabilitation*, 67(2), ss. 203–210, 2021. Doi: 10.5606/tftrd.2021.5164.

[27] Qin, J., Xiong, J., Wang, X., Gao, Y., Gong, K., "Kinesiophobia and its association with fatigue in CHF patients," *Clinical Nursing Research*, 31(7), ss. 1316–1324, 2022. Doi: 10.1177/10547738221081230.

[28] Liang, F., Liu, M., Han, H., Ru, Y., Yin, Y., Cheng, C., Gu, L., "Identifying patterns of kinesiophobia trajectories among COPD patients: A longitudinal study," *Nursing Open*, 10(6), ss. 3925–3935, 2023. Doi: 10.1002/nop2.1650.

[29] Sentandreu-Mañó, T., Deka, P., Almenar, L., Tomás, J. M., Ferrer-Sargues, F. J., López-Vilella, R., Klompstra, L., Marques-Sule, E., "Kinesiophobia and associated variables in patients with heart failure," *European Journal of Cardiovascular Nursing*, 23(3), ss. 221–229, 2024. Doi: 10.1093/eurjcn/zvad072.

[30] Liu, L., Yang, Q., Li, T., Xie, H., Zeng, B., Zha, L., Zhang, W., Su, S., "Prevalence and influencing factors of kinesiophobia in patients with heart disease: A meta-analysis and systematic review," *Scientific Reports*, 14(1), 18956, 2024. Doi: 10.1038/s41598-024-69929-9.

[31] Süleymanlar, G., Utaş, C., Arinsoy, T., Ateş, K., Altun, B., Altiparmak, M. R., Ecder, T., Yilmaz, M. E., Çamsari, T., Başçi, A., Odabas, A. R., Serdengeçti, K., "Prevalence of chronic kidney disease in Turkey: Results of the CREDIT study," *Nephrology Dialysis Transplantation*, 26(6), ss. 1862–1871, 2011. Doi: 10.1093/ndt/gfq656.