Investigation of the Relationship between Lower Urinary Tract Symptoms, Body Awareness, and Kinesiophobia in Patients with Chronic Low Back Pain and Mild to Moderate Disability*

Ümran KAPLAN**, İlknur USLU***, Zeynep BERBER****, Hümeyra KİLOATAR*****

Abstract

Aim: The purpose of this study was to assess the relationship between lower urinary tract symptoms, body awareness, and kinesiophobia in patients with chronic low back pain and mild to moderate disability.

Method: 94 patients with chronic low back pain and mild to moderate disability were included in the study. The disability level of the patients was assessed using the Oswestry Disability Index (ODI). Lower urinary tract dysfunctions were evaluated with the Core Lower Urinary Tract Symptom Score (CLSS), while body awareness was assessed using the Body Awareness Questionnaire (BAQ). The Tampa Kinesiophobia Scale was used to assess the participants' kinesiophobia.

Results: This study included a total of 94 patients with chronic low back pain, of whom 34 had mild disability and 60 had moderate disability. Statistically significant differences were found between the two disability groups (mild and moderate) in terms of the Tampa Kinesiophobia Scale, CLSS total score, and CLSS quality of life subscore ($p<0.05$). A strong positive correlation was observed between the ODI and CLSS ($r=0.358$, $p=0.000$), a significant positive correlation with the CLSS quality of life subscore ($r=0.317$, $p=0.002$), and a non-significant negative correlation with the BAQ ($r=-0.149$, $p=0.153$). Additionally, there was a significant positive correlation between the Tampa Kinesiophobia Scale and CLSS total score ($r=0.432$, $p=0.000$). A strong positive correlation was found between the CLSS total score and the CLSS quality of life score ($r=0.387$, $p=0.000$), while a significant negative correlation was observed with the BAQ ($r=-0.240$, $p=0.020$).

Conclusion: In individuals with chronic low back pain and mild to moderate disability, relationships have been observed between lower urinary tract symptoms, kinesiophobia, and body awareness levels. These findings point to the potential importance of considering not only physical but also psychological and pelvic health-related factors in the management of chronic low back pain. However, due to the cross-sectional design of the study, the causality of the relationship between these variables cannot be demonstrated; therefore, further research is needed.

Keywords: Chronic low back pain, disability, lower urinary tract symptoms, body awareness, kinesiophobia.

Özgün Araştırma Makalesi (Original Research Article)
Geliş / Received: 02.09.2024 **Kabul / Accepted:** 12.11.2025
DOI: https://doi.org/10.38079/igusabder.1541580
* This study was supported under the TÜBİTAK 2209-A - University Students Research Projects Support Program and was conducted under the supervision of Asst. Prof. Dr. Hümeyra KİLOATAR.
** PT, Samsun, Türkiye. E-mail: umrankaplan5505@gmail.com ORCID https://orcid.org/0009-0005-5774-7804
*** PT, Bursa, Türkiye. E-mail: ilknrusl@gmail.com ORCID https://orcid.org/0000-0002-9368-3132
**** PT, Kütahya, Türkiye. E-mail: zeynep.brber@gmail.com ORCID https://orcid.org/0009-0003-3939-1352
***** Asst. Prof, Department of Physiotherapy and Rehabilitation, Faculty of Health Science, Kütahya Health Sciences University, Campus of Germiyan, Kütahya, Türkiye. E-mail: hkiloatar@gmail.com ORCID https://orcid.org/0000-0003-4340-3443

ETHICAL STATEMENT: The Ethics Committee of Kütahya Health Sciences University provided ethical approval for the study (date: 07.05.2024 Protocol No: 2024/06-14).

Istanbul Gelisim University Journal of Health Sciences (IGUSABDER) is indexed by TUBITAK ULAKBIM TR Index.
Web site: https://dergipark.org.tr/en/pub/igusabder
Contact: igusabder@gelisim.edu.tr

Kronik Bel Ağrısına Bağlı Hafif-Orta Derecede Engelliliği Olan Hastalarda Alt İdrar Yolu Semptomları, Beden Farkındalığı ve Kinezyofobi Arasındaki İlişkinin Araştırılması

Öz

Amaç: Bu çalışmanın amacı, kronik bel ağrısı olan ve hafif ile orta düzeyde engelliliğe sahip hastalarda alt üriner sistem semptomları, beden farkındalığı ve kinezyofobi arasındaki ilişkiyi değerlendirmektir.

Yöntem: Çalışmaya kronik bel ağrısı olan ve hafif ile orta düzeyde engelliliğe sahip 94 hasta dahil edilmiştir. Hastaların engellilik düzeyi Oswestry Engellilik İndeksi (ODI) kullanılarak değerlendirilmiştir. Alt üriner sistem disfonksiyonları, Core Lower Urinary Tract Symptom Score (CLSS) ile değerlendirilirken, beden farkındalığı Beden Farkındalığı Anketi (BAQ) ile değerlendirilmiştir. Katılımcıların kinezyofobisi Tampa Kinezyofobi Ölçeği ile değerlendirilmiştir.

Bulgular: Çalışmaya kronik bel ağrısı olan toplam 94 hasta dahil edilmiştir; bunlardan 34'ü hafif engellilik, 60'ı ise orta düzeyde engellilik düzeyine sahiptir. İki engellilik grubu (hafif ve orta) arasında Tampa Kinezyofobi Ölçeği, CLSS toplam puanı ve CLSS yaşam kalitesi alt skoru açısından istatistiksel olarak anlamlı farklılıklar bulunmuştur ($p<0,05$). ODI ile CLSS arasında güçlü pozitif bir korelasyon ($r=0,358$, $p=0,000$), CLSS yaşam kalitesi alt skoru ile anlamlı pozitif bir korelasyon ($r=0,317$, $p=0,002$) ve BAQ ile anlamlı olmayan negatif bir korelasyon ($r =-0,149$, $p=0,153$) gözlemlenmiştir. Ayrıca, Tampa Kinezyofobi Ölçeği ile CLSS toplam puanı arasında anlamlı bir pozitif korelasyon saptanmıştır ($r=0,432$, $p=0,000$). CLSS toplam puanı ile CLSS yaşam kalitesi skoru arasında güçlü pozitif bir korelasyon ($r=0,387$, $p=0,000$) saptanırken, BAQ ile anlamlı negatif bir korelasyon gözlemlenmiştir ($r=-0,240$, $p=0,020$).

Sonuç: Kronik bel ağrısı olan ve hafif ile orta düzeyde engelliliğe sahip bireylerde, alt üriner sistem semptomları, kinezyofobi ve beden farkındalığı düzeyleri arasında ilişkiler gözlemlenmiştir. Bu bulgular, kronik bel ağrısının yönetiminde yalnızca fiziksel değil, aynı zamanda psikolojik ve pelvik sağlıkla ilişkili faktörlerin de dikkate alınmasının potansiyel önemine işaret etmektedir. Ancak, çalışmanın kesitsel tasarımı nedeniyle, bu değişkenler arasındaki ilişkinin nedenselliği gösterilememektedir; bu nedenle ileri araştırmalara ihtiyaç duyulmaktadır.

Anahtar Sözcükler: Kronik bel ağrısı, engellilik, alt üriner sistem semptomları, beden farkındalığı, kinezyofobi.

Introduction

Low back pain is considered a significant public health issue, capable of leading to permanent functional loss and workforce impairment, and can affect a large segment of the population. Chronic low back pain (CLBP) refers to a condition that involves pain lasting more than 12 weeks[1]. In 2020, 619 million people worldwide (nearly 10% of the global population) experienced low back pain (LBP), and this number is expected to reach 843 million by 2050[2]. LBP can affect daily living activities such as standing, walking, bending, lifting, traveling, social interaction, personal care, and sexuality. Therefore, preventing and effectively treating LBP is of great importance for public health.

Kinesiophobia is described as “an intense, irrational, and debilitating fear of physical movement and activity, arising from a perceived vulnerability due to an existing or potential injury”[3]. Cognitive-behavioral models, such as the fear-avoidance model, suggest that painful experiences can cause some individuals to develop a fear of movement and injury. This fear can lead to behavioral agitation and, over time,

Istanbul Gelisim University Journal of Health Sciences (IGUSABDER) is indexed by TUBITAK ULAKBIM TR Index.
Web site: https://dergipark.org.tr/en/pub/igusabder
Contact: igusabder@gelisim.edu.tr

contribute to depression and greater functional disability. Initially, it results in functional limitations, and over time, it may contribute to greater disability and the development of depression. This emerging fear has attracted growing attention in LBP research. It may lead individuals to withdraw from social life and worsen the severity of the condition[4].

Body awareness is related to an individual's perception of their body's position in space, proprioception, balance, sense of movement, and the perception of internal sensations[5]. In chronic pain conditions, mental and physical awareness can be lost due to the effects of anxiety, worry, denial, fear, and avoidance reactions. Increasing body awareness offers a range of benefits, including improving the sense of correct posture and position, recognizing discomfort, maintaining self-control, alleviating worries and anxieties, gaining more control over the body, and enhancing emotional awareness[6].

Lower urinary tract symptoms (LUTS) are signs connected to the lower urinary tract, arising from anatomical and physiological factors involving the bladder, prostate, urethra, pelvic floor, or pelvic organs[7]. Previous studies have suggested that individuals with CLBP may also experience LUTS, yet the mechanisms underlying this association remain unclear. It is hypothesized that changes commonly observed in CLBP—such as alterations in lumbopelvic stability, increased intra-abdominal pressure (IAP), and pelvic floor muscle dysfunction—may influence urinary system functions. These changes may disrupt the coordination and support provided by the musculoskeletal structures surrounding the bladder and urethra, potentially leading to LUTS[8,9]. Additionally, psychosocial factors (e.g., fear-avoidance beliefs, stress) associated with CLBP could further contribute to urinary symptoms. Kinesiophobia can exacerbate functional impairment and contribute to the persistence of pain. Reduced body awareness in individuals with chronic pain may further hinder effective pain management and exacerbate LUTS by disrupting lumbopelvic stability and increasing psychological distress. This interconnected relationship suggests that addressing body awareness and kinesiophobia could be crucial in the comprehensive management of CLBP and its associated symptoms.

The purpose of this study was to assess the relationship between LUTS, body awareness, and kinesiophobia in individuals with CLBP and mild to moderate disability.

Material and Methods

This study was designed as a cross-sectional study, utilizing face-to-face surveys with patients experiencing CLBP who visited the Physical Medicine and Rehabilitation outpatient clinic at the university hospital between May and August 2024. The study was conducted in accordance with the Declaration of Helsinki. All participants received detailed information about the study, and informed consent was obtained from each.

Participants

The study included patients over 18 years old who had mild to moderate disability from CLBP lasting more than six months and who voluntarily consented to participate.

Istanbul Gelisim University Journal of Health Sciences (IGUSABDER) is indexed by TUBITAK ULAKBIM TR Index.
Web site: https://dergipark.org.tr/en/pub/igusabder
Contact: igusabder@gelisim.edu.tr

Exclusion criteria for the study were severe neurological, orthopedic, or cardiopulmonary disease.

Assessments

Personal Information Form: Participants' age, occupation, gender, education level, height, and body weight were collected through a questionnaire prepared by the researchers.

Oswestry Disability Index: The Oswestry Disability Index (ODI) was used to evaluate the disability level related to CLBP in participants. Developed to measure functional impairment in individuals with LBP, the ODI assesses various aspects such as pain intensity, self-care, lifting and carrying ability, walking capacity, sitting comfort, standing duration, sleep quality, pain change, travel ability, and social life[10,11]. Each item in the questionnaire includes six statements, with the patient selecting the one that most accurately reflects their condition. The scoring ranges from "0 points" for the first statement to "5 points" for the sixth statement. Participants' functional levels are categorized based on their total scores: no functional disability (0 point); mild functional disability (1-10 points); moderate functional disability (11-30 points); and severe functional disability (31-50 points).

Core Lower Urinary Tract Symptom Score: The Core Lower Urinary Tract Symptom Score (CLSS), used to assess participants' LUTS, was developed by Homma and colleagues in 2008[12]. The Turkish validity and reliability study was conducted by Erbay and colleagues in 2022[13]. The questionnaire consists of 13 questions; the first 5 questions address storage issues, the next 3 address voiding issues, and the following 2 questions relate to lower urinary tract pain. These first 10 questions are scored on a Likert-type scale ranging from 0 to 3. CLSS also includes a question asking participants to list three key symptoms (question 11) and one question regarding the primary key symptom (question 12). Additionally, it includes a question related to quality of life (question 13). As the total score increases, the prevalence of LUTS as well as the occurrence of different types of LUTS (such as urgency, frequency, and nocturia) also tend to increase.

Body Awareness Questionnaire: The Body Awareness Questionnaire (BAQ), used to assess participants' body awareness, consists of 18 items grouped into four subcategories: 1) Predicting bodily responses, 2) Sleep-wake cycle, 3) Predicting the onset of illness, and 4) Attention to changes and responses in bodily processes[14]. Participants rated each of the 18 statements on a scale from 1 to 7. The overall score on the questionnaire can range from 18 to 126, with higher scores reflecting better body awareness.

Tampa Kinesiophobia Scale: The Tampa Kinesiophobia Scale (TKS), designed to assess fear of movement or re-injury, was used in this study to evaluate participants' levels of kinesiophobia[15]. The Turkish version of the scale, validated and found reliable by Yılmaz et al., utilizes a 4-point Likert scale, with responses ranging from 1 to 4[16]. The overall score can range from 17 to 68, with higher scores reflecting greater kinesiophobia.

Istanbul Gelisim University Journal of Health Sciences (IGUSABDER) is indexed by TUBITAK ULAKBIM TR Index.
Web site: https://dergipark.org.tr/en/pub/igusabder
Contact: igusabder@gelisim.edu.tr

Ethical Statement

The Ethics Committee of Kütahya Health Sciences University provided ethical approval for the study (date: 07.05.2024 Protocol No: 2024/06-14).

Statistical Analysis

The data were analyzed using IBM SPSS Statistics Standard Concurrent User Version 26 (IBM Corp., Armonk, New York, USA). Descriptive statistics were expressed as mean (X), standard deviation (SD), count (n), and percentage (%). Since the data did not exhibit a normal distribution, non-parametric tests were utilized. Participants were divided into groups with mild and moderate functional disability based on the Oswestry Disability Index. The Kruskal-Wallis test was utilized to examine differences among these groups. To explore the relationships between the parameters, the Spearman correlation test was applied.

Results

A total of 94 patients with CLBP participated in the study. Among them, 34 had mild disability, and 60 had moderate disability. The average age of the participants was 47.55±1.45 years, with an average body weight of 75.09±1.49 kg and an average height of 166.57±0.94 cm. Additional descriptive data for the participants are detailed in Table 1.

Table 1. Demographic data

	n=94
Age (years) (X±SD)	47.55±1.45
Height (cm) (X±SD)	166.57±0.94
Weight (kg) (X±SD)	75.09±1.49
BMI (X±SD)	27.02±0.46
Educational Status (n (%))	
Illiterate	5 (%5.3)
Primary School	36 (%38.3)
High School	12 (%12.8)
Associate Degree	10 (%10.6)
Bachelor's Degree	15 (%16.0)
Graduate Degree	16 (%17.0)
Marital Status (n (%))	
Married	75 (%79.8)
Single	19 (%20.2)

X:mean. SD: standard deviation. N: number of total participants.n:number of participants, kg:kilogram. m: meter. kg/m²: kilogram/meter², BMI: body mass index

Istanbul Gelisim University Journal of Health Sciences (IGUSABDER) is indexed by TUBITAK ULAKBIM TR Index.
Web site: https://dergipark.org.tr/en/pub/igusabder
Contact: igusabder@gelisim.edu.tr

Significant differences were observed between the two groups classified by the ODI (mild and moderate disability) regarding the TKS, CLSS total score, and CLSS quality of life score ($p < 0.05$). These findings are shown in Table 2.

Table 2. Comparison of parameters in patients grouped according to the oswestry disability index

	Mild Disability (n = 34) (X±SD)	**Moderate Disability (n=60) (X±SD)**	**p**
Tampa Kinesiophobia Scale	39.29±6.60	42.70±5.82	0.001*
Core Lower Urinary Tract Symptom Score	4.94±4.63	8.18±5.02	0.002*
Core Lower Urinary Tract Symptom Score-QoL Subscore	2.15±1.77	3.02±1.59	0.011*
Body Awareness Questionnaire	97.06±12.73	94.80±12.45	0.290

X:mean. SD: standard deviation, n:number of participants, p<0.05

Preliminary analyses revealed no significant differences in the relationships between variables across the disability groups. Therefore, the subsequent analyses were performed by pooling all participants into a single group. A strong positive correlation was found between the ODI and the CLSS (r=0.358, p=0.000), and a significant positive correlation with the CLSS quality of life subscore (r=0.317, p=0.002). There was no significant correlation with the BAQ (r = -0.149, p = 0.153). Additionally, a significant positive correlation was observed between the TKS and the CLSS total score (r=0.432, p=0.000). A strong positive correlation was found between the CLSS total score and the CLSS quality of life score (r=0.387, p=0.000), while a significant negative correlation was noted with the BAQ (r=-0.240, p=0.020). The correlation between the parameters is shown in Table 3.

Istanbul Gelisim University Journal of Health Sciences (IGUSABDER) is indexed by TUBITAK ULAKBIM TR Index.
Web site: https://dergipark.org.tr/en/pub/igusabder
Contact: igusabder@gelisim.edu.tr

Table 3. Relationship between disability severity, kinesiophobia, lower urinary tract symptoms, quality of life related to lower urinary tract symptoms, and body awareness in patients with chronic low back pain

	n=94	Oswestry Disability Index	Tampa Kinesiophobia Scale	CLSS	CLSS-QoL	Body Awareness Questionnaire
Oswestry Disability Index	**Spearman's Correlation**	1.000	0.197	0.358**	0.317**	-0.149
	Sig. (2-tailed)		0.058	0.000	0.002	0.153
Tampa Kinesiophobia Scale	**Spearman's Correlation**	0.197	1.000	0.432**	0.096	-0.024
	Sig. (2-tailed)	0.058		0.000	0.356	0.820
CLSS	**Spearman's Correlation**	0.358**	0.432**	1.000	0.387**	-0.240*
	Sig. (2-tailed)	0.000	0.000		0.000	0.020
CLSS-QoL	**Spearman's Correlation**	0.317**	0.96	0.387**	1.000	-0.099
	Sig. (2-tailed)	0.002	0.356	0.000		0.341
Body Awareness Questionnaire	**Spearman's Correlation**	-0.149	-0.024	-0.240*	-0.099	1.000
	Sig. (2-tailed)	0.153	0.820	0.020	0.341	

N: number of total participants, CLSS: Core Lower Urinary Tract Symptom Score, QoL: Quality of Life

Discussion

In this study, LUTS, LUTS-related quality of life, body awareness, and kinesiophobia were investigated in patients with CLBP and mild to moderate disability. The results revealed that patients with moderate disability experienced higher levels of kinesiophobia, more frequent LUTS, and, consequently, a lower quality of life compared to those with mild disability. However, body awareness levels were similar between the groups. Additionally, the study found that as the degree of disability increased in these patients, LUTS became more prevalent, quality of life declined, and body awareness decreased. Another key finding was the positive correlation between increased kinesiophobia and the frequency of LUTS. Lastly, it was noted that a decrease in body awareness was associated with a higher incidence of LUTS.

Disability related to CLBP is a multifaceted issue with significant social and health implications[17]. Since activity limitations are difficult to observe directly, physiotherapists

Istanbul Gelisim University Journal of Health Sciences (IGUSABDER) is indexed by TUBITAK ULAKBIM TR Index.
Web site: https://dergipark.org.tr/en/pub/igusabder
Contact: igusabder@gelisim.edu.tr

often rely on patients' self-reports[11]. The ODI is a widely used tool for measuring disability in individuals with LBP[18]. In our study, the disability level of patients with CLBP was assessed using the ODI. Among the participants included in our study, 63.83% had moderate disability, while 36.17% had mild disability. This distribution indicates that the majority of the individuals with CLBP experience a moderate level of functional limitation.

Spinal stabilization plays a key role in the development and management of LBP[19]. It relies on the coordinated activation of the diaphragm, abdominal, and pelvic floor muscles to regulate the IAP, which supports spinal stability. In healthy individuals, this process is controlled by a feed-forward mechanism; failure of early muscle activation may contribute to trunk instability[20,21]. A review study suggested that the link between LBP and urinary incontinence may stem from factors like pelvic floor dysfunction, lumbar disc disease, and viscerosomatic convergence, though further research is needed to confirm a causal relationship[9]. In a study investigating LUTS in patients with CLBP, it was found that 56.7% of the patients experienced at least one LUTS. However, it was noted that the patients' awareness of these symptoms was poor, and they may lack awareness of the connection between these symptoms and LBP[22]. In current study, it was found that as the disability level of patients increased, LUTS and associated quality of life decreased. The other important result of this study, patients with moderate disability due to CLBP experienced LUTS more frequently and had a lower quality of life related to LUTS compared to those with mild disability. Additionally, it was observed that as the level of disability increased, the severity of LUTS also increased, and quality of life decreased accordingly. We think that these results are significant because the study was conducted among patients with mild to moderate disability. Furthermore, to our knowledge, this is the first study to explore LUTS in relation to the level of disability in patients with CLBP.

Cognitive-behavioral models help explain the frequent occurrence of kinesiophobia in individuals with CLBP. Studies have indicated that kinesiophobia is present in patients with CLBP and that it increases with the level of disability[23-25]. The results of our study are consistent with these findings. An interesting finding of our study was the relationship between LUTS and kinesiophobia. The increase in kinesiophobia with worsening LUTS can be explained by several mechanisms. Social isolation due to LUTS and the belief that reducing movement can help manage symptoms may explain this relationship. Future studies are needed to conduct regression analyses to identify the factors influencing this condition.

In recent years, body awareness or perception has become an increasingly prominent area of research within the field of pain neuroscience. Altered body awareness has been observed in a variety of chronic pain conditions[26-28]. A systematic review conducted in 2023 assessing body awareness in patients with LBP suggests that individuals with LBP exhibit more impaired body awareness compared to healthy controls. However, the lack of a clear framework for the concept of body awareness and the absence of a gold standard measurement method hinder the ability to draw definitive conclusions from the studies conducted. In this study, although no significant difference in body awareness

Istanbul Gelisim University Journal of Health Sciences (IGUSABDER) is indexed by TUBITAK ULAKBIM TR Index.
Web site: https://dergipark.org.tr/en/pub/igusabder
Contact: igusabder@gelisim.edu.tr

was found between patients with mild and moderate disability, it was observed that as the level of disability increased, body awareness was negatively affected. Additionally, the presence of LUTS also had a detrimental impact on body awareness. These findings may be important in expanding the range of factors that need to be considered in the complex and challenging management of CLBP. However, there is a need to clarify how these parameters influence each other.

This study has some limitations. The first is that the assessment methods used in the study are based on patient self-reports. Another limitation is that the results may not be generalizable since only patients with mild to moderate disability due to CLBP were included.

Conclusion

In conclusion, this study highlights the multifaceted nature of CLBP, demonstrating that both physical and psychological factors contribute to the severity of lower urinary tract symptoms. The associations observed between LUTS, kinesiophobia, and body awareness suggest that addressing these interconnected domains may be critical in managing the overall well-being of individuals with CLBP. These findings suggest that addressing kinesiophobia and LUTS, as well as improving body awareness, may be critical in the holistic management of CLBP. Future research with more diverse populations and objective measures is needed to further explore these relationships and enhance our understanding of the multifactorial nature of CLBP.

Acknowledgement: This study was supported by the Scientific and Technological Research Council of Türkiye (TÜBİTAK) within the scope of the 2209-A-University Students Domestic Research Projects Support Program. The researchers thank TÜBİTAK for their support.

Conflict of Interest: The authors report no conflict of interest in this research.

Financial Disclosure: The authors declared that this study has received no financial support.

Ethics Committee Approval: Kütahya Health Sciences University Ethics Committee (Protocol No: 2024/06-14).

REFERENCES

1. Patrick N, Emanski E, Knaub MA. Acute and chronic low back pain. *Med Clin North Am*. 2014;98(4):777-789.

2. Rheumatology TL. The global epidemic of low back pain. *The Lancet Rheumatology*. 2023;5(6):e305.

3. SH K. Kinesiophobia: A new view of chronic pain behavior. *Pain Manage*. 1990;3:35-43.

4. Özmen T, Gündüz R, Doğan H, Zoroğlu T, Acar D. Kronik bel ağrılı hastalarda kinezyofobi ve yaşam kalitesi arasındaki ilişki. *FÜ Sağ Bil Tıp Derg*. 2016;30(1):1-4.

5. Mehling WE, Wrubel J, Daubenmier JJ, et al. Body awareness: A phenomenological inquiry into the common ground of mind-body therapies. *Philos Ethics Humanit Med*. 2011;6(1):6. doi: 10.1186/1747-5341-6-6.

6. Azizi F. Kronik Bel Ağrısı Olan Hastalarda Pilates Egzersizlerinin Ağrı, Fonksiyonellik ve Yaşam Kalitesi Üzerine Etkileri. [master's thesis]. İstanbul, Türkiye: İstanbul Medipol Üniversitesi Sağlık Bilimleri Enstitüsü; 2020.

7. D'Ancona C, Haylen B, Oelke M, et al. The International Continence Society (ICS) report on the terminology for adult male lower urinary tract and pelvic floor symptoms and dysfunction. *Neurourology and Urodynamics*. 2019;38(2):433-477.

8. de Abreu DL, Rodrigues PTV, Amaral Corrêa L, Lacombe A de C, Andreotti D, Nogueira LAC. The relationship between urinary incontinence, pelvic floor muscle strength and lower abdominal muscle activation among women with low back pain. *European Journal of Physiotherapy*. 2019;21(1):2-7.

9. Welk B, Baverstock R. Is there a link between back pain and urinary symptoms? *Neurourology and Urodynamics*. 2020;39(2):523-532.

10. Fairbank JC, Pynsent PB. The Oswestry disability index. *Spine*. 2000;25(22):2940-2953.

11. Yakut E, Düger T, Öksüz Ç, et al. Validation of the Turkish version of the Oswestry Disability Index for patients with low back pain. *Spine*. 2004;29(5):581-585.

12. Homma Y, Yoshida M, Yamanishi T, Gotoh M. Core Lower Urinary Tract Symptom score (CLSS) questionnaire: A reliable tool in the overall assessment of lower urinary tract symptoms. *International Journal of Urology*. 2008;15(9):816-820.

13. Erbay ME, Tarhan ST. Reliability and validity of the Turkish language version of the Core Lower Urinary Tract Symptom Score. *LUTS: Lower Urinary Tract Symptoms*. 2022;14(6):421-426.

14. Karaca S. Vücut Farkındalığı Anketinin Türkçe uyarlaması: Geçerlik ve Güvenirlik Çalışması. [yayınlanmamış yüksek lisans tezi]. Muğla, Türkiye: Muğla Sıtkı Koçman Üniversitesi Sağlık Bilimleri Enstitüsü;2017.

15. Vlaeyen JW, Kole-Snijders AM, Boeren RG, Van Eek H. Fear of movement/(re) injury in chronic low back pain and its relation to behavioral performance. *Pain*. 1995;62(3):363-372.

Istanbul Gelisim University Journal of Health Sciences (IGUSABDER) is indexed by TUBITAK ULAKBIM TR Index.
Web site: https://dergipark.org.tr/en/pub/igusabder
Contact: igusabder@gelisim.edu.tr

16. Yilmaz ÖT, Yakut Y, Uygur F, Uluğ N. Tampa Kinezyofobi Ölçeği'nin Türkçe versiyonu ve test-tekrar test güvenirliği. *Fizyoterapi Rehabilitasyon*. 2011;22(1):44-49.

17. Luo X, Pietrobon R, Sun SX, Liu GG, Hey L. Estimates and patterns of direct health care expenditures among individuals with back pain in the United States. *Spine*. 2004;29(1):79-86.

18. Walsh TL, Hanscom B, Lurie JD, Weinstein JN. Is a condition-specific instrument for patients with low back pain/leg symptoms really necessary? The responsiveness of the Oswestry Disability Index, MODEMS, and the SF-36. *Spine*. 2003;28(6):607-615.

19. Kolář P, Šulc J, Kynčl M, et al. Postural function of the diaphragm in persons with and without chronic low back pain. *J Orthop Sports Phys Ther*. 2012;42(4):352-362.

20. Stokes IA, Gardner-Morse MG, Henry SM. Intra-abdominal pressure and abdominal wall muscular function: Spinal unloading mechanism. *Clinical Biomechanics*. 2010;25(9):859-866.

21. Eliasson K, Elfving B, Nordgren B, Mattsson E. Urinary incontinence in women with low back pain. *Manual Therapy*. 2008;13(3):206-212.

22. Yumusakhuylu Y, Yagci HC, Bayindir SN. Lower urinary tract symptoms in patients with chronic low back pain: A cross-sectional study. *Cureus*. 2023;15(9).

23. Comachio J, Magalhães MO, Silva AP de MCC e, Marques AP. A cross-sectional study of associations between kinesiophobia, pain, disability, and quality of life in patients with chronic low back pain. *Advances in Rheumatology*. 2018;58:8.

24. Uluğ N, Yakut Y, Alemdaroğlu İ, Yılmaz Ö. Comparison of pain, kinesiophobia and quality of life in patients with low back and neck pain. *Journal of Physical Therapy Science*. 2016;28(2):665-670.

25. Luque-Suarez A, Martinez-Calderon J, Falla D. Role of kinesiophobia on pain, disability and quality of life in people suffering from chronic musculoskeletal pain: A systematic review. *British Journal of Sports Medicine*. 2019;53(9):554-559.

26. Wand BM, Elliott RL, Sawyer AE, et al. Disrupted body-image and pregnancy-related lumbopelvic pain. A preliminary investigation. *Musculoskeletal Science and Practice*. 2017;30:49-55.

27. Kalkışım ŞN, Erden A, Kanber Uzun Ö, Ertemoğlu Öksüz C, Zihni NB, Çan MA. Relationship between body awareness level and musculoskeletal pain complaints, physical activity level and emotional status in healthy people. *Acta Neurologica Belgica*. 2023;123(5):1789-1796.

Istanbul Gelisim University Journal of Health Sciences (IGUSABDER) is indexed by TUBITAK ULAKBIM TR Index.
Web site: https://dergipark.org.tr/en/pub/igusabder
Contact: igusabder@gelisim.edu.tr

28. Lauche R, Cramer H, Haller H, et al. My back has shrunk: The influence of traditional cupping on body image in patients with chronic non-specific neck pain. *Forschende Komplementärmedizin/Research in Complementary Medicine*. 2012;19(2):68-74.

Istanbul Gelisim University Journal of Health Sciences (IGUSABDER) is indexed by TUBITAK ULAKBIM TR Index.
Web site: https://dergipark.org.tr/en/pub/igusabder
Contact: igusabder@gelisim.edu.tr