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ORIGINAL ARTICLE

An analysis on factors affecting back awareness of postmenopausal women with chronic low back pain

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Purpose: Back awareness, which related with interoceptive and proprioceptive systems, is very important for postmenopausal women with chronic low back pain. The of this study was to show the relationship between back awareness and kinesiophobia level, pain, disability and, body awareness in postmenopausal women with chronic low back pain.
Methods: One hundred and eighty-five women (with a mean age of 58.3±8.53 years) with chronic low back pain in the postmenopausal period were included in the study. The Fremantle Back Awareness Questionnaire was used to evaluate back-specific body perception (back awareness). The Tampa Scale of Kinesiophobia-11, Visual Analogue Scale, The Roland Morris Disability Questionnaire, and The Body Awareness Questionnaire were also used.
Results: Sixty one percent of the women reported chronic low back pain at least last year. There were weak correlations between Fremantle Back Awareness Questionnaire total score and kinesiophobia level (r=0.193; p=0.009), pain intensity (r=0.352; p=0.001), pain duration (r=0.191; p=0.009) and disability (r=0.394; p=0.001). There was no correlation between Fremantle Back Awareness Questionnaire total score and body awareness level (r=0.033; p=0.654).
Conclusion: According to the results of this study, the back-specific body perception associated with kinesiophobia, pain, and disability. In this respect, the study reveals the importance of the concept of back awareness, which expresses the level of perception of changes in the back region.
Keywords: Postmenopausal, Low back pain, Awareness, Kinesiophobia

Postmenopozal dönemdeki kronik bel ağrılı kadınların bel farkındalık düzeylerini etkileyen faktörlerin incelenmesi

Amaç: Bel farkındalığı, interoseptif ve propriyoseptif sistemlerle ilişkili olması sebebiyle, menopoz sonrası dönemdeki kronik bel ağrılı kadınlarda oldukça önemlidir. Bu çalışmanın amacı, postmenopozal dönemindeki kronik bel ağrılı kadınların bel farkındalık düzeylerinin kinezyofobi seviyesi, ağrı, özür durumu ve beden farkındalığı ile ilişkisini incelemektir.
Yöntem: Çalışmaya 185 (yaş ortalaması 58.3±8.53 yıl) postmenopozal dönemdeki kronik bel ağrılı kadın dâhil edildi. Bele özgü vücut algısı (bel farkındalığı) Fremantle Bel Farkındalık Anketi ile değerlendirildi. Ayrıca Tampa Kinezyofobi Ölçeği-11, Görsel Analog Skalası, Roland Morris Özürlülük Anketi ve Vücut Farkındalık Anketi kullanıldı.
Bulgular: Kadınların %61'inin en az son bir yıldır bel ağrısı şikayeti vardı. Fremantle Bel Farkındalık Anketi toplam puanı ile kinezyofobi seviyesi (r=0.193; p=0.009), ağrı şiddeti (r=0.352; p=0.001), ağrı süresi (r=0.191; p=0.009) ve özürlülük (r=0.394; p=0.001) arasında zayıf düzeyde ilişki vardı. Fremantle Bel Farkındalık Anketi toplam puanı ile beden farkındalık düzeyi arasında ilişki yoktu (r=0.033; p=0.654).
Sonuç: Bu çalışmanın sonuçlarına göre, bele özgü vücut algısı kinezyofobi, ağrı ve özürlülük ile ilişkilidir. Çalışma bu bakımdan, bel bölgesindeki değişiklikleri algılama düzeyini ifade eden bel farkındalığı kavramının önemini ortaya koymaktadır.
Anahtar kelimeler: Postmenapoz, Bel ağrısı, Farkındalık, Kinezyofobi.

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Chronic low back pain (CLBP) is an extremely common condition in the post-menopausal period, affecting an estimated 70 per 1.000 women.[1] It is generally associated with gender, age, life conditions, job issues, genetic factors, musculoskeletal structures and hormones in this period.[2] Pain, muscle spasm, decreased muscle strength and, postural dysfunction affect the daily life activities and quality of life, negatively.[3] Menopause decreasing quality of life constitutes more than one third of a women's life.[4] Hormonal changes, decreased bone mineral density, and, muscle volume changes result in pain.

Back awareness is a parameter of impaired perceptual awareness in people with CLBP.[5] Back awareness can be defined as disrupted back region caused by low back pain. Proprioceptive and interoceptive systems are the basis of perceptual awareness. As the body is whole integrated systems, correct communication between these systems and the correct interpretation of the messages constitute awareness. Wand et al.[6] claim that changes in central nervous system structure and their functions occur in individuals with CLBP. Increased nociceptive efficacy, the consequent attention-related attention, and maladaptive perceptual awareness of the lumbar region (deliberate reduction in the back region) may lead to central nervous system changes, ongoing back pain and disability. These changes result from the basis of the concepts of back awareness and body awareness. Disturbances in awareness affect back pain and motor control of pain.[5] Therefore, it is necessary to focus on back awareness in postmenopausal women, too. The psychological effects of pain affect, negatively, mobility, the person's focus on himself/herself and, his/her social participation and environment. The person is to avoid moving after this period. And kinesiophobia behavior, which is the fear avoidance reaction, occurs. In this context, kinesiophobia is not only associated with physical conditions but also with the emotional status.[7] Therefore, kinesiophobia is closely related to the concept of awareness, which is achieved through correct interpretation of both the emotional and physical functioning of the person suffering from chronic pain. Previous studies about postmenopausal low back pain are often associated with osteoporosis. The gap of back awareness and body awareness in women during menopause is a vital issue that needs searching. The pragmatic aim of this study was to show using holistic view if there any correlation between back awareness and kinesiophobia, pain, disability and, body awareness level.

As far as we know, it could not be found any research which assessed the correlation between back awareness and some physical and psychological factors in postmenopausal women with CLBP. The present study may give different results to plan the most suitable evaluation and treatment approaches for postmenopausal women.

We hypothesized that back awareness would be associated with kinesiophobia, pain, disability and body awareness in postmenopausal women with chronic low back pain.

METHODS

The cross-sectional and single center study was performed between October 2017-December-2018. It was approved by Ethics Committee on Scientific Researches of Kanuni Education Research Hospital in University of Health Sciences in Trabzon, Turkey. All participants were informed about study procedures and they gave their signed consent to participate in the study, which is prepared in occurrence with the Helsinki Declaration Principles.

One-hundred and eighty-five postmenopausal women (aged between 45-75 years) with CLBP were included in the study recruiting from a private hospital in Istanbul, Turkey. All the data were collected by two experienced physical therapists, who were educated about study procedure and data collecting system by the authors. The inclusion criteria were the presence of non-specific low back pain for longer than 3 months, no menstrual bleeding in the last 12 months[8], to be native writer and reader in Turkish language. Patients were excluded if they had previous surgery in spine, any malignant disease, psychiatric problems, any cognitive problems and unexplained or abnormal vaginal bleeding within 6 months.

A Structured Sociodemographic Data

Form: Demographics, including age, and menopausal age, Body Mass Index (BMI) score, and educational level were recorded.

Fremantle Back Awareness Questionnaire (FreBAQ): Back-specific body perception was assessed by FreBAQ. There was a total of 9 items with items 1, 2 and 3 associated with negligence (FreBAQ-1), 4 and 5 with proprioceptive sharpness (FreBAQ-2), and 6, 7, 8 and 9 with body composition and size (FreBAQ-3). A five-point response scale (range: 0 = *'never'* up to 4 = *'always'*) was used to enable quantitative assessment of any reported symptoms, the final score was obtained by summing the responses from each of the nine items such that the total score could range from zero to 36. The Turkish validity and reliability study of the scale was performed by Erol et al.[9] (Cronbach's Alpha=0.870). The FreBAQ total score and sub-dimension scores were used.

Tampa Scale of Kinesiophobia 11 (TSK-11): The TSK-11 was used to determined kinesiophobia of the participants. It was developed to evaluate the fear of movement. The questionnaire is a checklist of 11 items with responses given as a 4-point Likert-type response (1= Strongly disagree, 4= Fully agree). The total score can range from 11 to 44, with a high score indicating a high level of kinesiophobia. Validity and reliability analyses of the Turkish version of Tampa Scale of Kinesiophobia have been previously made by Yılmaz et al.[10] (Intraclass correlation coefficient= 0.806).

Visual Analogue Scale (VAS): The VAS was used to evaluate pain intensity. This scale allows evaluation of pain over a 10 cm line, where 0= no pain and 10= intolerable pain.[11] Pain duration also was recorded.

Roland Morris Disability Index (RMDI): The RMDI was used to determine impaired functional status (disability level) in patients with low back pain. The RMDI is consisting of 24 items starting with "because of my low back pain". The number of positive answers is recorded as RMDI score. High score means bad functional status. The validity and reliability studies of RMDI in Turkish were made by Küçükdeveci et al.[12] (Cronbach's Alpha=0.850).

Body Awareness Questionnaire (BAQ): The BAQ total score was used to assess body awareness level. The BAQ consists of 18 items in 4 subgroups that aim to determine the body awareness level: changes in the body process, body responses prediction, sleep-wake cycle, disease onset. Each item is scored from 1-7 and total points are used for analysis with high scores indicating better body sensitivity.[13] The Turkish validity and reliability of this questionnaire has been studied by Karaca and Bayar.[14] (Cronbach's Alpha=0.870).

Statistical analyses

The SPSS version 20.0 software (Statistical Package for Social Sciences) was used to compute and to analyze the data just collected in the study. Power analysis was done to determine the size of the sample by using the G* power 3.1.9.2. Study was performed in 95% confidence interval and 80% power. Descriptive data, percentage (%), mean and standard deviation (Mean±SD) were calculated. To analyze correlations between the non-parametric independent variables, the Spearman's correlation test was used. Correlation level was evaluated weak between 0-0.49, moderate between 0.5-0.74, and strong between 0.75-1.[15] A value of $p<0.05$ was accepted as the level of statistical significance.

RESULTS

The mean age of the participants was 58.3±8.53 years. The mean menopausal age of the participants was 47.55±5.95 years. The sociodemographic and clinical data were shown in Table 1.

There were significant positive weak correlations between FreBAQ total score and kinesiophobia level (r=0.193; p=0.009), pain intensity (r=0.352; p=0.001), pain duration (r=0.191; p=0.009) and disability (r=0.394; p=0.001). However, there was no correlation between FreBAQ total score and body awareness level (r=0.033; p=0.654) (Table 2). Analyses in sub-dimensions of the FreBAQ, there was a weak positive correlation between neglect-like symptoms (FreBAQ-1) and kinesiophobia (r=0.249; p=0.001). There was a weak positive correlation between pain intensity and all sub-dimensions of FreBAQ, respectively (FreBAQ-1: r=0.359; p=0.001, FreBAQ-2: r=0.237; p=0.001, FreBAQ-3: r=0.270; p=0.001). There was a weak positive correlation between pain duration and neglect-like symptoms (FreBAQ-1) (r=0.248; p=0.001). There was a

weak positive correlation between disability and all sub-dimensions of FreBAQ (FreBAQ-1: r=0.364; p=0.001, FreBAQ-2: r=0.212; p=0.004, FreBAQ-3: r=0.340; p=0.001). There were no significant correlations between the FreBAQ sub-dimensions scores and body awareness level (p>0.05) (Table 3).

DISCUSSION

In the present study, back awareness related factors on kinesiophobia, pain and functional disability in postmenopausal women with chronic low back pain were investigated. According to our results, the back-specific body perception associated with kinesiophobia, pain, and disability; however, back awareness was not associated with body awareness.

Kinesiophobia is defined as a debilitating, illogical and excessive fear of physical movement and activity, resulting in the sensation of pain in the event of a painful injury or re-injury. Uçurum and Kalkan[16] reported that the rate of kinesiophobia was common in people with CLBP and this was related to educational status, age, pain and, quality of life. But there wasn't any research investigated association between kinesiophobia and back awareness in literature. In our study weak correlation was found between kinesiophobia and the neglect-like symptoms subdimension of FreBAQ. Kinesiophobia is a process of fear that develops against physical activity. This fear is not directly related to the perception of the body shape because the proprioception system provides feedback for correct movement. That a disruption in this system would prevent the movement from being perceived properly and caused fear was one of the hypotheses of the study. However, the correlation was insignificant. This was thought to be due to the lack of sufficient substance for proprioception on the scale. There is a need for further studies to measure and evaluate with objective data to provide more objective results. In addition, a significant relationship was found between kinesiophobia and negligence sub-dimension of FreBAQ. Excessive fear and avoidance behavior caused by kinesiophobia reveals a number of functional losses due to not using body parts. Unused functions are forgotten, and muscles are not activated properly. Therefore, the association between kinesiophobia and muscle disruption is a reflection of the fear avoidance reaction developed by the individual at the level of back awareness.

The results of the present study showed that back awareness level was associated with pain intensity and pain duration in postmenopausal women with CLBP. Studies in related literature shows that changes in somatosensory areas occur in people with CLBP.[17,18] It is suggested that changes in body image also affect back pain intensity. However, a limited number of studies have been published on this subject. Moreover, there are very few studies focusing on body awareness. Erden et al.[13] found a negative correlation between pain intensity and body awareness, although there was not significant. Studies demonstrating the positive effects of body awareness enhancing methods on pain intensity are more prominent. The results obtained from this study indicate that there is a relationship between back awareness and pain intensity and, pain duration. High intensity pain leads to atrophy in the muscles. The sense of proprioception from muscle fibers decreases due to this atrophy[19] and the decrease in this feedback from the cortex can be considered to affect back awareness.

In postmenopausal term functional disability is very common condition. By repeating an action over and over again, a person places the chain of movements of that action in the muscle memory. In the postmenopausal period, pain increases with decreasing bone mineral density. Feeling pain during movement encourages patients to act more slowly and cautiously.[1] Consequently, functional losses occur. In our study, there was positive correlation between back awareness and disability. We can explain this with a decrease in movements causes disruption of the back-muscle memory. This could be considered as muscle pain, which affected back awareness. It is needed further researches to support this result.

According to our study results, there was not a correlation between back awareness and body awareness. It was thought that there were not enough relevant items in body awareness scale to measure back problems. With more appropriate body awareness measurement, changes in the perception of signals from the lumbar region and relationship between body

awareness and back awareness can be defined better. That's way it is needed to develop new

CLBP is vital. There is not enough study presenting some evidence about this field. It is needed further researches to support the results.

There are very few studies in related literature about back awareness. Although some studies about the postmenopausal period have emphasized changes in body composition, to the best our knowledge, no study has been conducted about how these changes are perceived and how they affect the back and body. In this study, the relationships between back awareness, kinesiophobia, pain intensity, pain duration and, disability were meaningful in postmenopausal women with CLBP. In this context, this study presents new data about back awareness in post-menopausal women with CLBP. Namely, this is a strong aspect of

Table 1. Sociodemographic and clinical data of the participants.

	Mean±SD
Age (year)	58.30±8.53
Menopause age (year)	47.55±5.95
Fremantle Back Awareness Questionnaire (FreBAQ) (0-36)	16.85±10.08
FreBAQ-1 (Neglect-like symptoms) (0-12)	5.88±4.04
FreBAQ-2 (Reduced proprioceptive acuity) (0-6)	4.11±2.88
FreBAQ-3 (Body size and shape) (0-16)	6.85±5.17
Tampa Scale for Kinesiophobia 11 (11-44)	25.80±8.67
Pain intensity score (Visual Analog Scale, cm)	6.09±2.28
Pain duration (month)	49.40±3.73
Roland Morris Disability Questionnaire (0-24)	14.37±7.91
Body Awareness Questionnaire (0-126)	95.15±18.36
	n (%)
Body Mass Index Classification	
Weak	3 (1.6)
Normal	21 (11.4)
Overweight	55 (29.7)
Obese	106 (57.3)
Education level	n (%)
Illiterate	48 (25.9)
Primary school	113 (61.1)
High school	18 (9.7)
University	6 (3.3)
Faculty	4 (2.0)
Master education	1 (0.5)
Pain duration (month)	n (%)
<6	25 (13.5)
6-12	47 (25.4)
12-60	66 (35.6)
>60	47 (25.4)

Table 2. Correlations among all outcome measurements (N=185).

	Fremantle Back Awareness Questionnaire	
	r	p*
Tampa Scale for Kinesiophobia 11	.193	.009
Pain intensity score (Visual Analog Scale)	.352	.001
Pain duration (month)	.191	.009
Roland Morris Disability Index	.394	.001
Body Awareness Questionnaire	.033	.654

Table 3. Correlations between sub-dimensions of The Fremantle Back Awareness Questionnaire (FreBAQ) and the other outcome measurements.

	FreBAQ-1		FreBAQ-2		FreBAQ-3	
	r	p*	r	p*	r	p*
Tampa Scale for Kinesiophobia 11	0.249	0.001	0.123	0.097	0.122	0.085
Pain intensity score (Visual Analog Scale)	0.359	0.001	0.237	0.001	0.270	0.001
Pain duration (month)	0.248	0.001	0.131	0.076	0.098	0.183
Roland Morris Disability Index	0.364	0.001	0.212	0.004	0.340	0.001
Body Awareness Questionnaire	0.108	0.145	0.076	0.304	0.032	0.666

Spearman's correlation. FreBAQ-1: Neglect-like symptoms score. FreBAQ-2: Reduced proprioceptive acuity score. FreBAQ-3: Body size and shape score.

our study. The results of this study can be considered of value as they will show the need to include back awareness in the evaluation and treatment approaches for CLBP in the postmenopausal period accompanying with more specific items about back region.

Limitations

Most of the participants were in primary school education level, and this level may have caused limitations in the perception and response to problems.

Conclusion

The results obtained from this study suggest that kinesiophobia, pain and disability level should also be assessed in postmenopausal women with CLBP. A clinical assessment and rehabilitation program taking into accent all related factors identified in this study to affect back awareness of postmenopausal women with

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