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Research Article / Araştırma Makalesi

Comparison of Neck Awareness, Physical and Psychosocial Parameters in Inactive University Students with and without Neck Pain

Boyun Ağrısı Olan ve Olmayan İnaktif Üniversite Öğrencilerinde Boyun Farkındalığı, Fiziksel ve Psikososyal Parametrelerinin Karşılaştırılması

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Abstract: The aim of the study was to compare neck awareness, muscular endurance, mental state and self-efficacy parameters in young adults with and without neck pain and to examine the relationship of awareness with pain intensity, muscular endurance and anxiety and depression in the group with neck pain. A total of 104 students with neck pain (n=41) and without neck pain (n=63) with a mean age of 22.85 ± 3.53 years were included in the study. Visual Analog Scale (VAS), Cervical Deep Flexor Muscle Endurance Test, Hospital Anxiety and Depression Scale (HADS) and Fremantle Neck Awareness Questionnaire (FreBAQ) were used to collect the data. When the groups were compared in terms of physical and psychosocial data, it was determined that the group with neck pain was negatively affected compared to the group without neck pain in terms of all parameters (p<0.05). In the group with neck pain, there was a positive correlation between the FreBAQ and the HAD scale values(p<0.05); there was no correlation between deep flexor neck muscular endurance and neck pain(p>0.05). According to the results of the study, neck pain negatively affects physical and psychological factors in university students and neck awareness is especially associated with anxiety and depression.

Keywords: Young Adult, Neck Pain, Neck Awareness, Mental State, Muscular Endurance.

Öz: Çalışmanın amacı, boyun ağrısı olan ve olmayan genç yetişkin gruplarda boyun farkındalığı, kassal endurans, ruhsal durum ve öz-yeterlilik parametrelerin karşılaştırılması ve boyun ağrılı grupta farkındalığın ağrı şiddeti, kassal endurans ve anksiyete depresyon ile ilişkisinin incelenmesidir. Çalışmaya yaş ortalaması 22,85 ± 3,53 yıl olan, boyun ağrılı (n=41) ve boyun ağrısı olmayan (n=63) toplam 104 öğrenci dahil edilmiştir. Çalışmanın verilerinin toplanmasında Görsel Analog Skala (GAS), Servikal Derin Fleksör Kas Endurans Testi, Hastane Anksiyete ve Depresyon Ölçeği (HADÖ) ve Fremantle Boyun Farkındalık Anketi (FreBFA) kullanılmıştır. Gruplar fiziksel ve psikososyal veriler açısından karşılaştırıldıklarında tüm parametreler açısından boyun ağrısı olan grubun boyun ağrısı olmayan gruba göre olumsuz yönde etkilendiği belirlenmiştir (p<0,05). Boyun ağrısı olan grupta, Fremantle Boyun Farkındalık Testi ile HAD ölçeği değerleri arasında pozitif bir korelasyon olduğu(p<0,05); derin fleksör boyun kassal enduransı ile boyun ağrısı arasında ise bir korelasyon olmadığı bulunmuştur(p>0,05). Çalışmanın sonuçlarına göre boyun ağrısının üniversite öğrencilerinde fiziksel ve psikolojik faktörleri olumsuz yönde etkilediği ve boyun farkındalığının özellikle anksiyete ve depresyon ile ilişkili olduğu görülmüştür.

Anahtar Kelimeler: Genç Yetişkin, Boyun Ağrısı, Boyun Farkındalığı, Ruhsal Durum, Kassal Endurans.

Introduction

Chronic neck pain is a common problem affecting 75% of the general population (Fejer et al., 2006). One third of the young adult population complains of neck pain at least once a week (Hogg-Johnson et al., 2008). In a study conducted in university students aged 18- 25 years in our country, it was reported that the lifetime incidence of neck pain in students was 43.70% (Kurtaran et al., 2019). According to the results of studies on chronic pain prevention, neck pain ranks first among the reasons for seeking health care (Fricton et al., 2015). Within a bio-psycho-social framework, a number of factors cause neck pain, and these factors may also contribute to the transition from an acute pain state to a chronic pain state (Nagrale et al., 2010, Lau et al., 2011).

Mechanical causes (Hidelgo et al., 2017), myofascial disorders in the neck/shoulder region (Gallego et al., 2020) are among the factors that cause neck pain. Neck muscle endurance has been found to be associated with chronic neck pain (Schomacher et al., 2013, Kahlaee et al., 2017).Factors such as increased long-term use of phones and computers in inappropriate positions in young populations cause postural disorders and musculoskeletal pain (Sihawong et al., 2011, Kim et al., 2015). It has been reported that the effect of impaired body perception on the severity of the clinical condition makes a more significant contribution than other factors affecting the clinical condition. In case of impaired body perception, an unconscious awareness occurs and conscious perception is impaired (Wand et al., 2016). Studies have shown that improving habitual postural patterns can improve musculoskeletal pain or prevent further deterioration. However, changing habitual patterns requires awareness (Cramer et al., 2018). Researchers state that chronic pain is associated with impaired body awareness. This suggests that mindfulness should be examined in chronic pain (Wand et al., 2016).

How the body perceives and experiences pain has recently attracted attention. The response to pain is related to perceived health, tolerance, and beliefs about the risk associated with a particular movement or activity (Wiech et al., 2004). Self-efficacy belief is an important factor affecting pain response (Bandura, 1994). In addition, self-efficacy is also effective in the formation and change of patients' health-related behaviors (Yıldırım et al., 2010). There are examples of studies examining patient behaviors related to self-efficacy in the field of health, but there are not many studies on neck pain.

Neck pain may be caused by psychosocial factors as well as physical factors (Linton 2000). Emotional states may affect body positions and functions of extremities. The presence of depression and anxiety is thought to be a factor in the onset and chronicity of neck pain and in increasing the severity of pain (Shahidi et al., 2015). Therefore, it is important to measure the presence of anxiety and depression in patients.

Health-related behaviors acquired in the early period of life affect the risks for lifestyle-related disorders in the future and the incidence of preventable diseases that may cause problems in later ages (Von Bothmer et al., 2005).In our country, university students represent a large portion of the young adult population (Savcı et al., 2010). It is important to identify potential pain factors among young adults and thus prevent the development of neck pain later in life (Kanchanomai et al., 2011).

The primary aim of this study was to compare neck awareness, muscular endurance, anxiety-depression and self-efficacy in young adults with and without neck pain. The secondary aim was to investigate the relationship of mindfulness with pain intensity, muscular endurance, self-efficacy, anxiety and depression in a group with neck pain.

Materials and Methods

The population of the study was Pamukkale University Physiotherapy and Rehabilitation Faculty students. The sample of the study consisted of volunteer students who met the study criteria in this population.

The study was conducted on inactive volunteer students between the ages of 18-25. In order to carry out the study, all classes were informed by the researchers about the purpose of the study and the inclusion criteria and it was emphasized that the study was voluntary. Individuals who had neck pain for at least 3 months and scored above 0 on the Visual Analog Scale (n=41) and individuals who had not had neck pain for the last 6 months (n=63) were included participate in the study.

Exclusion criteria included a history of previous surgery on the spine, malignant conditions, neurologic and orthopedic diagnoses, musculoskeletal pain apart from cervical region and any condition that posed an obstacle to perform the assessments. At the same time, individuals with improve musculoskeletal pain other than the cervical region were exclusion criteria for both groups. There were no individuals who met the exclusion criteria among the students who volunteered to participate in the study.

Ethical approval was obtained from Pamukkale University Non-interventional Clinical Research Ethics Committee for the conduct of the study with the decision number 60116787- 020/92293 dated 25.12.2019. The study was conducted in accordance with the principles defined in the Declaration of Helsinki. Informed written consent was obtained from all participants.

Sociodemographic Data Form. Participants' age, gender, height, body weight, and body mass index were recorded on the socio-demographic form.

Evaluation of pain intensity. Pain intensity was assessed with the Visual Analog Scale (VAS). Participants were asked to mark the intensity of pain they felt on a 10 cm long horizontal line. The point marked on the line was measured with a ruler and the GAS value was recorded in cm (0 cm: No pain; 10 cm: Intolerable pain) (Wewers et al., 1990).

General Health Status Assessment: To assess general health status, participants were asked the question "How would you rate your general health status?" and were asked to mark one of the answers "excellent, very good, fair, poor, poor" (Cavlak et al., 2009)

Evaluation of cervical region deep flexor muscle endurance: The 'Cervical Region Deep Flexor Muscle Endurance Test' was used for the evaluation. The test was performed in supine hook position. Individuals were asked to maximally retract the chin (*chin tuck* position) and lift the head and neck approximately 2.5 cm from the lying position while maintaining the retraction isometrically. The students were asked to maintain this position for as long as possible and the time to maintain the position was recorded in seconds. The test was terminated if the test position disappeared, if there was a sudden and severe increase in pain or if the person did not want to continue the test (Harris et al., 2005)

Assessment of Neck Awareness: Neck awareness was assessed with the Fremantle Neck Awareness Questionnaire. The Turkish validity and reliability of the questionnaire developed by Wand et al. was performed by Onan et al. (ICC0.711). The questionnaire is a Likert-type scale that evaluates individual-specific altered perception. The 9 statements that make up the scale are graded from 0 = Never/never feel this way, 1 = Rarely feel this way, 2 = Sometimes, or some times feel this way, 3 = Often feel this way, 4 = Always or most of the time feel this way. The total score ranges from 0-36, with an increase in score indicating a poor prognosis (Wand et al., 2016, Onan et al., 2019).

Assessment of Self-Efficacy: General Self-Efficacy Scale was used in the study. The Turkish validity and reliability of the General Self-Efficacy Scale developed by Sherer et al. (1982) was conducted by Yıldırım and İlhan (2010) (Yıldırım 2010). Items 2, 4, 5, 6, 7, 10, 11, 12, 14, 16 and 17 in the 17-item Likert format scale are reverse scored and the score of each question varies between 1-5. The total score of the scale can vary between 17-85; the higher the score, the higher the self-efficacy belief (Yıldırım 2010).

Assessment of anxiety and depression: The
Hospital Anxiety and Depression Scale (HAD)
developed by Zigmond et al. in 1983 was used in
the study (Zigmond et al., 1983). The HAD
consists of 14 items and assesses 2 different
psychological states: anxiety and depression. The
questionnaire is scored between 0 and 21 and the
higher the score, the more mood disturbance. The
Turkish validity and reliability of the scale was
conducted by Aydemir et al. in 1997 (Aydemir et
al., 1997).

Data Analysis

Data analysis was performed with 22.0 SPSS
package program. In the analysis of the
demographic characteristics of the participants, %
distributions, mean and standard deviations were
given. According to whether the other data were
normally distributed or not, the data of the groups
were compared with the T test in independent
groups from parametric tests or Mann-Whitney U
test from non-parametric tests. p<0.05 was
accepted as significant. Pearson correlation
analysis was used if the data were normally
distributed, and Spearman correlation analysis was
used when the data were not normally distrubuted.

Results

The study included 44 female and 30 male students
with a mean age of 22.85 ± 3.53 years. The mean
pain duration of the students in the neck pain
group was 20.53 months, ranging from 3 months
to 72 months, and the mean pain intensity was 4.86
according to the VAS pain scale. There was no
difference between the socio-demographic data of
individuals with and without neck pain (p>0.05)
(Table 1).

Table1. Comparison of socio-demographic data of individuals with and without neck pain

	Neck pain (n=41)		No neck pain (n=63)		p
	$\bar{x}$	S.S.	$\bar{x}$	S.S.	
Age (years)	23,17	3,87	22,63	3,29	0,450
Body weight (kg)	64,87	11,91	64,42	14,52	0,867
Height (cm)	168	8	167	9	0,720
BMI (kg/m)²	22,84	3,17	22,75	3,35	0,891
Duration of pain (months)	20,53	11,64	-	-	
	n	**%**	**n**	**%**	
Gender	30	73,2	44	69,8	0,717
Woman Male	11	26,8	19	30,2	

BMI: Body Mass İndex ***p<0.05** *Independent samples T test

.

Table2. Comparison of general health status of individuals with and without neck pain

General Health Status Questionnaire	Neck pain (n=41)		No neck pain (n=63)		p
	n	%	**n**	%	
Weak	1	2,4	0	0	**0,009***
Middle	19	46,3	15	23,8	
Very good	18	43,9	40	63,5	
Perfect	3	7,3	8	12,7	

*p<0.05 * Independent samples T test.

The general health status of the group without neck pain was found to be better than the group with neck pain (p<0.05), (Table 2).

When the groups were compared in terms of physical and psychosocial data, a significant difference was found in favor of the group without neck pain according to the results of deep flexor neck endurance test, HADE anxiety, depression sub-parameters and total value and FreBAQ questionnaire (p<0.05). There was no statistically

significant difference between the two groups in terms of self-efficacy scores (p>0.05) (Table 3).

In the neck pain group, a positive correlation was found between FreBAQ value and HADE-anxiety, HADE-depression and HADE-total values (p<0.05). There was no statistically significant relationship between FreBAQ value and deep neck flexor muscle endurance and neck pain (p>0.05) (Table 4).

Table3. Comparison of Physical and Psychosocial Data of Students with and without Neck Pain

General Health Status Questionnaire	Neck pain (n=41)		No neck pain (n=63)		p
	n	%	n	%	
Weak	1	2,4	0	0	**0,009***
Middle	19	46,3	15	23,8	
Very good	18	43,9	40	63,5	
Perfect	3	7,3	8	12,7	

p<0.05 *Independent groups T test; **Mann Whıtney-U, HADE: Hospital Anxiety and Depression Scale.

Table 4. The Relationship Between Fremantle Neck Awareness Questionnaire Value and Pain Severity, Anxiety and Depression, Self-Efficacy and Muscular Endurance in Individuals with Neck Pain.

	VAS Activity	HADE anxiety	HADE depression	HADE total	Neck endurance	Self- efficacy
Neck Awareness Scale	0,310	0,001**	0,015*	0,003**	0,912	-0,081

p<0.05 HADE: Hospital Anxiety and Depression Scale, VAS: Visual Analog Scale.

Discussion

The first results of this study showed that neck pain negatively affected physical, psychological parameters and neck awareness in young adults compared to young adults without neck pain. Another result we obtained from our study was that there was a relationship between neck awareness and psychological parameters in young adults with neck pain.

In recent years, there has been an increase in researches on how neck pain affects the cervical

motor system, posture and movement (Blomgren et al., 2018). Most studies have examined the relationship between neck pain and flexor muscle endurance and generally found that flexor muscle endurance is low in people with neck pain (Piper et al., 2009, Edmondston et al., 2011, Parazza et al., 2014). Falla et al. demonstrated the loss of endurance of deep cervical flexors using surface electromyography in patients with chronic neck pain and found that this condition caused pain (Falla et al., 2004). In the recent study, in parallel with the literature, it was determined that cervical

region flexor muscle endurance was lower in young individuals with neck pain compared to those without neck pain. We thought that the inclusion of training for cervical muscle endurance, which decreased with neck pain especially in young individuals, in the rehabilitation program may be protective against physical effects such as postural problems that may be seen in later ages.

In the literature, it is known that one of the underlying causes of chronic neck pain is psychosocial reasons and it is stated that these reasons should be investigated (Blozik et al., 2009 Carroll et al., 2008). Studies have shown that anxiety and depression symptoms are more common and severe in individuals with neck pain (Demyttenaere et al., 2007, Liu et al., 2014, Dimitriadis et al., 2015). Carroll et al. found a strong correlation between depressive symptoms and the onset of a pain episode and reported that the most depressed group had a fourfold increased risk of neck pain compared to the least depressed group (Carroll et al., 2008). Studies on psychological factors in neck pain have emphasized that psychological factors may cause neck pain or neck pain may cause psychological problems (Linton et al., 2000). In a study examining the relationship between neck pain, anxiety and depression in 448 patients, it was shown that depression and anxiety were closely related to recurrent neck pain (Blozik et al., 2009). In our study, anxiety and depression symptoms were found to be higher in the group with neck pain (p<0.05). The recent results are consistent with the literature. This may be due to the fact that patients with prolonged and severe neck pain are negatively affected in terms of mood.

It has been reported that self-efficacy is associated with patients' ability to continue daily activities in the face of obstacles such as pain; therefore, it is an important predictive factor for pain (Nicholas et al., 2007). Self-efficacy has been found to significantly mediate the relationship between pain and disability (Lee et al., 2015). Greater self-efficacy may enable individuals to recognize and reduce some of the underlying causes of

musculoskeletal pain, such as poorly coordinated posture and movement habits, excessive muscle tension, and associated psychological distress (Woodman et al., 2018). Studies have shown that neck pain and self-efficacy are interrelated (Chiarotto et al., 2018, Monticone et al., 2021). The recent , no significant difference was found between the groups with and without neck pain and the general self-efficacy scale. The reasons for this may be explained by the fact that the individuals who make up the population of my study are young university students; in other words, apart from the pain, they are young individuals, and the opportunities provided by university education, such as academic and social opportunities, are equivalent, and different situations enable them to have the same level of self-efficacy.

Studies have reported that chronic pain is associated with the deterioration of the perceived body image of painful body parts and that this deterioration leads to an increase in chronic pain severity and prolongation of pain duration, and that pain severity decreases as awareness increases (Moreira et al., 2017, Cramer et al., 2018). In the first of two different studies examining the contribution of neck awareness to the relationship between neck awareness and chronic neck pain in the literature, it was concluded that body awareness was affected in individuals with chronic neck pain (Özel 2022). The recent, it was determined that the awareness levels of students with neck pain were lower. Another study found that pain intensity was weakly associated with neck awareness in individuals with chronic neck pain (Şimşek et al., 2022 The recent, it was found that there was no difference between awareness level and pain intensity. It was thought that the reason for the difference between the two studies in terms of pain intensity may be due to the sociodemographic characteristics of the subjects participating in the study.

When the literature is examined, it is seen that there are few studies examining the relationship between muscle endurance and neck awareness and different opinions have been put forward on

this issue. In Dere's study, it was found that there was a relationship between neck awareness and cervical flexor, trunk, upper extremity and scapular region muscular endurance in individuals with neck pain (Dere 2021). Şimşek et al. found a weak positive correlation between neck pain and decreased neck awareness (Şimşek et al., 2022). In a different study conducted with patients with chronic neck pain, no relationship was found between neck awareness and cervical muscle endurance in individuals with chronic neck pain (Özel 2022). Similarly, in our study, there was no relationship between muscular endurance and awareness. It is thought that this may be related to the evaluation of not only cervical endurance but also body parts adjacent to this region with neck awareness.

Anxiety can exacerbate chronic pain, while reducing anxiety and anxiety levels can mediate recovery (Linton 2000). In the study by Özel et al. a weak positive relationship was found between neck awareness and anxiety, while no relationship was found between neck awareness and depression (Özel 2022). The researchers associated this situation with the borderline anxiety and depression of the individuals with neck pain who participated in the study. Onan et al. stated that chronic neck pain contributes to the deterioration of neck awareness and perception in individuals (Onan et al., 2019). According to the results of our study, neck awareness was found to be positively associated with anxiety and depression symptoms. The relationship we found between awareness and mental status in young individuals reveals the importance of psychological support with a multidisciplinary approach as well as interventions for physical parameters in individuals with neck pain.

The most important limitation of our study was that possible postural errors such as head posture, which may be related to neck awareness in individuals with neck pain, and severity of disability were not examined. In the literature, interest in examining neck awareness, especially with patient-reported questionnaires, has recently increased. In order to determine the effect of neck pain on awareness, future studies should examine various factors that may affect neck awareness in populations with different characteristics such as age and gender. The strength of our study was that it wass a study examining the physical and psychosocial effects of neck pain on neck awareness in young adult groups. It was thought that defining neck awareness and psychosocial status in young adult groups will help to determine the necessary treatment programs to take precautions for neck pain later in life.

Conclusion

According to the results of this study, neck endurance and neck awareness levels were lower and anxiety and depression levels were higher in students with neck pain compared to students without neck pain. In addition, neck awareness was associated with anxiety and depression in young people with neck pain. The results of this study revealed that muscular endurance, emotional state and neck awareness should be included in the evaluation parameters of young individuals with neck pain and the importance of developing appropriate treatment strategies with a multidisciplinary approach.

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