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Original Article / Araştırma Makalesi

INVESTIGATION OF THE RELATIONSHIP BETWEEN PAIN PERCEPTIONS AND PAIN BELIEFS AND SYMPTOM SEVERITY OF INDIVIDUALS IN DIFFERENT AGE GROUPS WITH CHRONIC LOW BACK PAIN

Kronik Bel Ağrısı Olan Farklı Yaş Gruplarındaki Bireylerin Ağrı Algıları ve Ağrı İnançları ile Semptom Şiddeti Arasındaki İlişkinin İncelenmesi

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ABSTRACT

Chronic low back pain (CLBP) is theoretically low back pain experienced for more than 12 weeks or 3 months. The aim of this study was to investigate the relationship between pain perceptions, beliefs and symptom severity of individuals in different age groups with CLBP. The study was conducted between December 2022 and March 2023 with 210 individuals. Participants were divided into 3 groups according to age; 18-39, 40-56, 57-79. The Demographic Information Form, Pain Beliefs Scale (PBQ), Centrality of Pain Scale (COPS) and Numeric Rating Scale (NRS-11) questionare were used to record the personal information and to measure participant's pain beliefs pain perceptions, and the severity of pain experienced. One-Way MANOVA was used to evaluate the difference between age groups. NRS-11 was found significantly different between age groups of 18-39/40-56 and 18-39/57-79 ($p<0.05$). Significant difference was observed in the Psychological Pain Beliefs Scale among the age groups of 40-56/57-79 and 18-39/57-79 ($p<0.05$). Organic Pain Beliefs Scale was found significantly different in age group of 18-39/57-79 ($p<0.001$). In conclusion, increasing age was found to be directly proportional to pain intensity and the strength of pain beliefs. Also, age factor was not found to be effective on the pain centralization in individuals with CLBP.

Keywords: Age, Chronic low back pain, Pain beliefs, Pain perception.

ÖZ

Kronik bel ağrısı (KBA) teorik olarak 12 hafta veya 3 aydan daha uzun süredir yaşanan bel ağrısıdır. Bu çalışmanın amacı, kronik bel ağrısı olan farklı yaş gruplarındaki bireylerin ağrı algıları ve ağrı inançları ile semptom şiddeti arasındaki ilişkiyi araştırmaktır. Çalışma Aralık 2022-Mart 2023 tarihleri arasında 210 kişi ile gerçekleştirildi. Katılımcılar yaşlarına göre 3 gruba ayrıldı; 18-39, 40-56, 57-79. Kişisel bilgileri kaydetmek ve katılımcıların inançlarını, ağrı algılarını ve yaşadıkları ağrının şiddetini ölçmek için Demografik Bilgiler, Ağrı İnançları Ölçeği (AİÖ), Ağrının Merkeziliği Ölçeği (COPS) ve Sayısal Derecelendirme Ölçeği (NRS-11) anketleri kullanıldı. Yaş grupları arasındaki farkın değerlendirmesinde One-Way MANOVA yöntemi kullanıldı. NRS-11, 18-39 / 40-56 ve 18-39 / 57-79 yaş grupları arasında anlamlı farklılık gözlendi ($p<0.05$). Psikolojik Ağrı İnanç Ölçeği'nde 40-56 / 57-79 ve 18-39 / 57-79 yaş grupları arasında anlamlı farklılık gözlendi ($p<0.05$). Organik Ağrı İnanç Ölçeği 18-39 / 57-79 yaş grubunda anlamlı olarak farklı bulundu ($p<0.001$). Sonuç olarak, artan yaşın ağrı şiddeti ve ağrıya ilişkin inançların gücü ile doğru orantılı olduğu bulundu. Ayrıca, KBA'lı bireylerde yaş faktörünün ağrı merkezileşmesi üzerinde etkili olmadığı bulundu.

Anahtar kelimeler: Ağrı algısı, Ağrı inançları, Kronik bel ağrısı, Yaş.

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INTRODUCTION

According to the definition of the International Association for the Study of Pain, pain is defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage. Since the sensation experienced by an individual has both physical and emotional characteristics, pain is often difficult to accurately measure and assess. Pain occurs in certain pathological conditions in the body. It also helps to avoid the offending pathogen or stimulus. However, when the signaling state becomes abnormal and chronic, the sensation of pain can become both physically and psychologically harmful to the individual (Lee & Neumeister, 2020). Most of the human population has been reported to experience acute low back pain, even if only once in their lives. This condition usually resolves spontaneously but also can become chronic over a long period of time.

Chronic low back pain (CLBP) is theoretically defined as low back pain experienced for more than 12 weeks or 3 months in duration. It involves complex interactions involving biological, psychological and social factors (Knezevic, Candido, Vlaeyen, Van Zundert & Cohen, 2021). One third of patients with low back pain report that they have moderate pain that persists one year after an acute attack (Urits et al., 2019). Major factors such as inactivity, posture disorders, smoking, occupation, education level, sedentary life, obesity, lack of attention to body biomechanics, age, psychological and psychosocial factors play role in the etiology of CLBP. The transformation of acute pain into chronic pain is associated with negative changes in people's activities of daily living, quality of life and functional movements. It decreases productivity, causes significant loss of labor force and imposes a great economic burden on all countries.

Published practice-oriented clinical guidelines for the treatment of low back pain emphasize that patients should be evaluated with a biopsychosocial approach. They state that social, psychological and biomedical situations have important effects on pain experience and dysfunctions. Chronic pain has been considered as a biopsychosocial condition in which biological factors as well as contextual, cognitive and emotional factors significantly influence pain perception. This biopsychosocial approach is more inclusive than the classical biomedical approach which usually considers pain as a consequence of tissue damage. For most cases of low back pain, there is no pure biomedical diagnosis. For this reason, the guidelines emphasize that patients suffering from low back pain should be handled through a biopsychosocial approach, which also includes psychosocial factors such as disease perception (Leysen et al., 2021). Considering the biopsychosocial model, changes in the individual's posture, muscle

strength imbalances, problems in the joints, spine and lower extremities due to movement restrictions, thoughts, attitudes and movements may also affect CLBP (Günay Uçurum & Kalkan, 2018). The prolongation of pain beliefs from acute to chronic pain often leads to kinesiophobia increased risk of injury and more severe pain. It has been shown that positive pain-related beliefs, levels of cognition, and behavioral patterns are significantly associated with increased functionality and greater adherence to treatment. The pain-related belief changes are also associated with changes in pain severity, pain-related interventions and psychological functionality (Orhan et al., 2018).

Beliefs associated with low back pain have been identified as factors that may influence self-management behaviors and indicate the ability to better cope with low back pain (Morton, de Bruin, Krajewska, Whibley & Macfarlane, 2019). Pain and avoidance behaviors that occur with the reduction of physical activities play an important role in the etiopathogenesis of CLBP (Yerlikaya & Saracoglu, 2022). In some cases, individuals who experience fear of movement try to avoid the possibility of a new injury or recurrence of an injury. As a result, they limit their activity levels and adopt a more sedentary lifestyle. From a biomedical perspective, pain from tissue damage in the lower back has been associated with higher levels of disability and pain-related fear. Having a belief that the lower back is weak, vulnerable and in need of protection is associated with fear and avoidance behaviors that lead to higher levels of pain. Due to the negative outcomes and inconsistencies in the available evidence on pain, targeting beliefs about low back pain is recognized as an important priority to reduce the burden of low back pain (Christe, Pizzolato, Meyer, Nzamba & Pichonnaz, 2021). Beliefs about low back pain influence the processing of nociceptive stimuli, progression of disability, and pain adaptation. Previous studies have reported that expectations of pain intensity arising from previous experience and learning result in the perception of pain at the expected level (Jepma, Koban, van Doorn, Jones & Wager, 2018). The hypothesis of our study is that there may be a relationship between psychological pain beliefs and pain severity of different age groups in individuals experiencing chronic low back pain.

The aim of this study was to investigate the perceptions and beliefs affecting pain symptom severity in individuals with CLBP in Turkey and to examine the relationship between these factors according to the age level of individuals.

MATERIAL AND METHOD

Study Design

This study was conducted between December 2022 and March 2023 in Istanbul, Turkey. It was ethically approved by the Üsküdar University Non-Interventional Research Ethics Committee (61351342, No. 12, 30/11/2022). All participants gave their informed permission in accordance with the Helsinki Declaration. G-Power 3.1.9 package program was used to calculate the sample size; MANOVA: Global Effects Post Hoc: Compute Achieved Power analysis was applied for 3 groups, 2 dependent variables, with α=0.05 type I error and 0.047 effect size, and 210 participants were included in the study. The consort diagram of the participants included and excluded in the present study was given in Figure 1. The purpose and content of the study were explained to the participants by the researchers. The questionnaires were delivered to the participants face-to-face or online via Google Forms survey. Criteria for inclusion in the study were; having had back pain for at least the last three months, being between the ages of 18-79, being literate, having accepted the voluntary consent form requiring participation in the survey, being able to communicate in Turkish, and not having any cognitive or mental problems. Exclusion criteria from the study were determined as being outside the age range of 18-79, having undergone a surgical operation on the waist area in the last 3 months, and having any psychiatric disease.

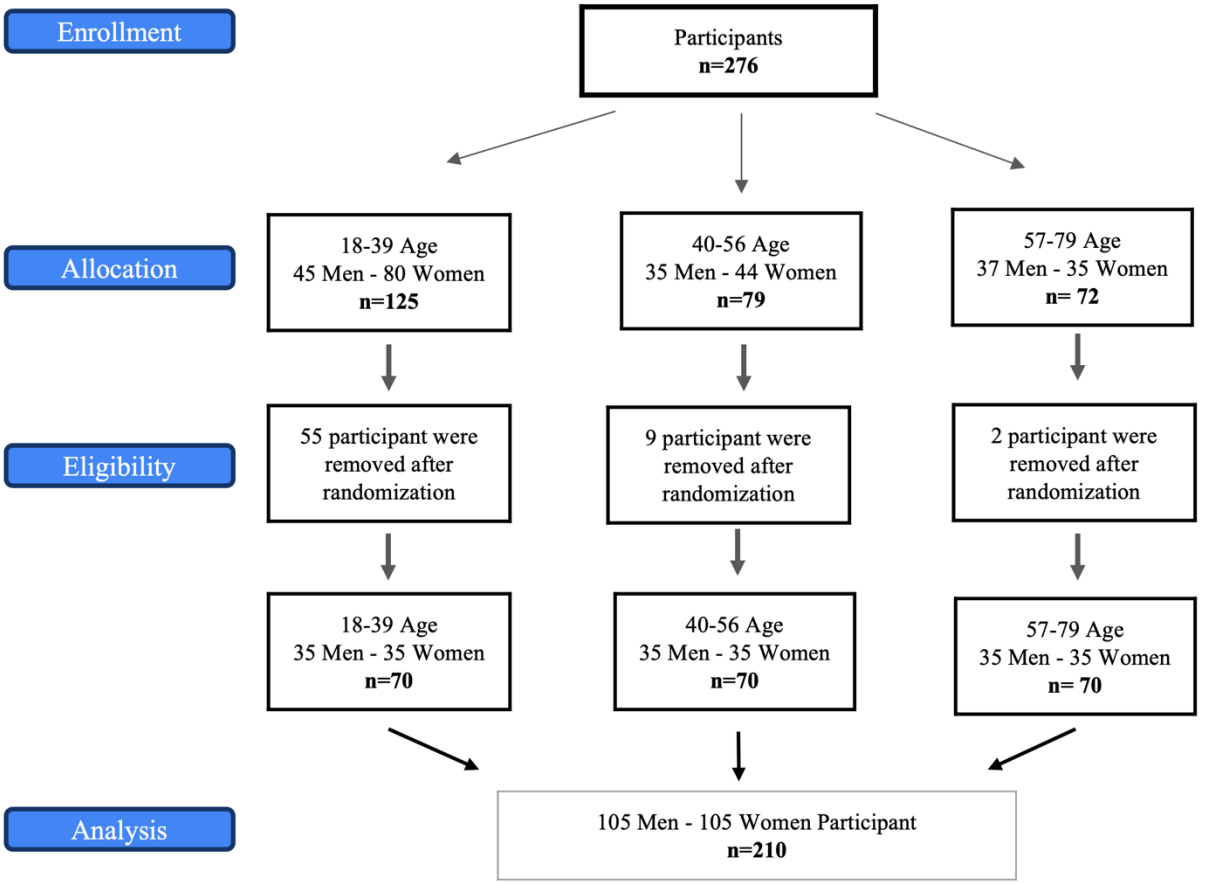

Figure 1. CONSORT Diagram of the Study

Data Collection Tools

The data collection process was conducted face-to-face and online with a Google Forms questionnaire. Demographic Information Form, Pain Beliefs Questionnaire (PBQ) (Berk, 2006), the Numeric Rating Scale (NRS-11) (Hartrick, Kovan & Shapiro, 2003) and the Centrality of Pain Scale (COPS) (Unubol & Ulutatar, 2020) scales were used in the study. In PBQ; Organic and Physiologic Pain Belief Scale were evaluated independently.

Data Analysis

The compliance levels of the variables included in the study with normal distribution were evaluated with the Shapiro-Wilk test. One-Way MANOVA was used to evaluate the significant difference between age groups in terms of NRS-11, Organic and Psychological Pain Beliefs Scale and COPS. In case of significant difference, the Bonferroni method was preferred to determine which groups the difference originated from. IBM SPSS Statistics 26.0 (IBM Corp. Released 2019. IBM SPSS Statistics for Windows, Version 26.0. Armonk, NY: IBM Corp) and G-Power 3.1.9 package program was used to calculate the sample size. Statistical significance level was accepted as $p<0.05$.

RESULTS

A total of 210 people were included in the study. Participants were compared in three different age groups. In these age groups, 70 participants were at the age of 18-39 [35 males (50%), 35 females (50%)], 70 participants were at the age of 40-56 [35 males (50%), 35 females (50%)] and 70 participants were at the age of 57-79 [35 males (50%), 35 females (50%)] (Table 1).

Table 1. Demographics of Participants

Age groups	Number of participants	Gender		Age Mean ± SD
		Male	Female	
18-39	70	35 (%50)	35 (%50)	28.58±5.24
40-56	70	35 (%50)	35 (%50)	47.22±5.5
57-79	70	35 (%50)	35 (%50)	66.54±7.3

Among the total participants, 3.3% were literate (n=7), 20% were primary school (n=42), 6.1% were secondary school (n=13), 27.6% were high school (n=58), 36.6% were university (n=77), 5.2% were master's degree (n=11), and 0.95% were PhD or higher degree graduates (n=2). 68.6% of the participants was non-smokers (n=144).

Significant differences were found between the age groups in terms of pain severity (NRS-11), Organic and Psychological Pain Belief Scale (PBQ) (Table 2). NRS-11 was found significantly different between age groups of 18-39 / 40-56 ($p<0.028$) and 18-39 / 57-79 ($p<0.001$). Similarly, significant difference was observed in the Psychological Pain Belief Scale ($p <0.001$) among the age groups of 40-56 / 57-79 ($P <0.001$) and 18-39 / 57-79 ($p <0.04$). Organic Pain Belief Scale was found significantly different in age group of 18-39 / 57-79 ($p <0.001$). No significant difference was found in terms of COPS among the age groups (Table 2).

Table 2. Comparison Of NRS-11, PBQ and COPS Between the Age Groups

Groups	NRS-11	PBQ (Psychological Beliefs)	PBQ (Organic Beliefs)	COPS
18-39 / 40-56	0.028*	>0.999	0.062	>0.999
40-56 / 57-79	0.258	0.010*	0.051	0.301
18-39 / 57-79	<0.001**	0.040*	<0.001**	0.076

DISCUSSION

Low back pain is one of the most common types of pain that individuals experience throughout their lives (Pillastrini et al., 2015). Although most cases of low back pain are non-vital, average 62% of people with low back pain continued to experience pain for 12 months

(Buchbinder, Underwood Hartvigsen & Maher, 2020; Hestbaek, Leboeuf-Yde & Manniche, 2003). The number of reports on chronic pain, pain beliefs and pain perception has increased in recent years. However, there are a limited number of studies in which these factors are evaluated together and relationship levels are compared in different age groups. Therefore, this study is one of the rare studies in this respect. The present study showed that the age factor was effective on the level of pain beliefs (PBQ) and pain severity (NRS-11). Although age factor was not found to be effective on the pain centralization in individuals with CLBP, it was found to be related to the psychologic and organic pain beliefs.

Most studies have emphasized that both the prevalence and incidence of CLBP increase with age (Dionne, Dunn & Croft, 2006; Hoy, Brooks, Blyth & Buchbinder, 2010; Thomas, Peat, Harris, Wilkie & Croft, 2004). The highest prevalence of CLBP was found in the 80-84 age group worldwide (Wang et al., 2022). It is documented that the prevalence of CLBP is higher (60%) in people over 77 years of age (Jacobs, Hammerman-Rozenberg, Cohen & Stessman, 2006). It was also shown that peak incidence occurs between ages 30 and 40 of life, with overall prevalence increasing through age 60 to 65 (Hoy et al., 2010). Docking et al. reported that the 1-month prevalence of disabling low back pain increased from 3.8% in people aged 77-79 years to 9.7% in people aged 90-100 years (Docking et al., 2011). Individuals aged 80 and older have shown to experience severe low back pain three times more than those aged 50 to 59. As a result, it was concluded that older people have more physical disabilities due to low back pain compared to younger people (Williams & Craig, 2016). Timely treatment of low back pain in older adults is crucial, as severe low back pain often leads to adverse treatment outcomes and functional problems. In addition, working-age adults were found to more likely to develop CLBP lasting longer than 3 months than older adults (aged ≥65) (Hartvigsen., Frederiksen & Christensen, 2006). Maher et al. stated that low back pain is more common in women than in men (Maher, Underwood & Buchbinder, 2017). When the risk of low back pain was analyzed in all participants within the scope of the study, it was determined that approximately 40% of the older adults who did not currently experience low back pain were found be at a possible risk. Similar studies have shown that approximately 50% of older adults who currently experience low back pain are at serious risk (Yağci, Cavlak, Baskan & Öztop, 2020).

Pain beliefs mainly involve how people think about their pain (suffering) and what it means to them. Beliefs provide a framework for understanding what illness is and how to deal with it, including the choices made about health care. In Waddell's definition, pain is not only

physical but also emotional stress. The possible effects of pain depend not only on its intensity and duration, but also on how people feel about coping with the condition (Waddell, 2004). While most people are interested in understanding how their pain occurs, they are equally concerned about the risk of any current or future injury. The fear of future pain is therefore as important as the pain they are experiencing now. According to Pincus and Morley, beliefs about pain have been shown to play an important role in the pain experience and the level of adaptation to pain (Pincus & Morley, 2002). People with low back pain may have certain beliefs about their pain, influenced by their social environment and past experiences (Von Korff & Moore, 2001). In this study, it was observed that participants' pain beliefs increased in parallel with advancing age. Also, the mean organic and psychological pain belief scores of the participants in the older age group were the highest among the other age groups. These results suggest that people develop stronger beliefs about pain and health conditions, especially at older ages. Therefore, increasing age creates a higher risk of negative health problems, as indicated in studies on pain beliefs. In a study examining the effect of pain levels and pain beliefs on the quality of life of elderly people living in nursing homes, it was emphasized that pain belief is an important concept that should be evaluated since it plays an important role in response to treatment and perception of pain (Dogan & Goris, 2018). According to Jiménez-Sánchez et al., psychological stress issues (e.g., depression or anxiety) are among the significant risk factors for permanent or debilitating low back pain for older adults (Jiménez-Sánchez et al., 2012). It has also been shown that older people with high depressive symptom scores at the onset are twice as likely to have low back pain at 4-year follow-up (Docking et al., 2011). In the study, age was found directly proportional to pain intensity in CLBP. It was concluded that older individuals felt more intense pain than younger individuals. Age was found to be associated with the strength of beliefs about pain. Older individuals were found to have more organic and psychological pain beliefs than those in younger age groups. However, in this case, the relationship between people's ability to access available health services and health-related information in the process of developing pain beliefs should not be ignored. The mean scores of psychological pain beliefs were higher than the mean scores of organic pain beliefs in all three age groups. In line with this result, during the evaluation and treatment of individuals suffering from chronic pain, in addition to the physical dimension of pain, the psychological impact dimension should also be examined in detail. Older people in particular may experience more intense pain and develop stronger pain beliefs because of the potential injury scenarios and current or prospective health concerns they create in relation to pain. Managing their pain

and staying active can become even more important for them, especially if their current sense of control is low and they believe that their pain will lead to a serious problem in the long term.

Although it is thought that smokers may have a negatively different pain perception compared to non-smokers, the exact effect of smoking on pain perception is still unclear (Shi, Weingarten, Mantilla, Hooten & Warner, 2010). Glassman et al. reported that smoking can cause degenerative changes in spinal structures such as intervertebral discs over time (Glassman et al., 2000). Therefore, these degenerative disorders that occur over time are a threat that has the potential to compress nerve structures and may pose a risk of neuropathic low back pain. In this study, smoking was not significantly associated with low back pain severity (p=0.905). This result suggests that further research is needed to investigate the relationship of smoking and pain beliefs and perception. Our study presents a unique value as it is one of the first studies in the literature to examine the relationship between pain beliefs, pain perceptions and pain intensity in chronic low back pain according to different age groups. The fact that not all surveys were conducted face to face can be seen as a limitation of the study, as it may affect the answers of the participants.

In conclusion, increasing age was found to be directly proportional to pain intensity in CLBP. In this case, it was concluded that older individuals felt more intense pain than younger individuals. Similarly, the age factor was found to be associated with the strength of beliefs about pain. It was found that older individuals had more organic and psychological pain beliefs than younger individuals. In addition, age was not found to be a significant factor in pain centralization.

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