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Research Article

Identification of Musculoskeletal Health Status, Pain Acceptance, and Coping Strategies in Individuals with Chronic Pain and Physical Disabilities: A Cross-Sectional Comparative Study

Kronik Ağrılı ve Bedensel Engelli Bireylerde Kas-İskelet Sistemi Sağlık Durumu, Ağrı Kabulü ve Başa Çıkma Stratejilerinin Belirlenmesi: Kesitsel Karşılaştırmalı Bir Çalışma

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ABSTRACT

Purpose: The purpose of this study is to determine the musculoskeletal health status, pain acceptance, and coping strategies of individuals with chronic pain and physical disabilities and compare them with control group. **Material and Methods:** This cross-sectional study included a total of 88 participants, divided into two groups: the study group (individuals with chronic pain and physical disabilities; n=44) and the control group (individuals with chronic pain but without disabilities; n=44). Participants' musculoskeletal health was assessed using the Musculoskeletal Health Questionnaire (MHQ), pain acceptance using the Chronic Pain Acceptance Questionnaire (CPAQ), and coping strategies were evaluated using the COPE inventory. **Results:** Significant differences were observed between the groups in terms of MHQ scores and COPE scores ($p<0.05$), favoring the control group. However, there were no significant differences in terms of CPAQ scores ($p>0.05$). **Conclusion:** This results emphasizes the need for a careful assessment of coping strategies in individuals with chronic pain and physical disabilities in interdisciplinary chronic pain management programs, as well as the inclusion of personalized coping strategies in the intervention program.

Keywords: Disabled Persons; Coping Strategies; Acceptance Process; Chronic pain; Musculoskeletal Diseases.

ÖZ

Amaç: Bu çalışmanın amacı, kronik ağrılı ve bedensel engelli bireylerin kas-iskelet sistemi sağlık durumu, ağrı kabulü ve başa çıkma stratejilerinin belirlenmesi ve kontrol grubuyla karşılaştırılmasıdır. **Gereç ve Yöntem:** Bu kesitsel çalışmaya çalışma grubu (kronik ağrısı ve bedensel engeli olan bireyler; n=44) ve kontrol grubu (kronik ağrısı olan ancak engeli olmayan bireyler; n=44) olmak üzere iki gruptan oluşan toplam 88 katılımcı dahil edildi. Katılımcıların sağlık durumu Kas-İskelet Sistemi Sağlık Durumu Anketi (MHQ), ağrı kabulü Kronik Ağrı Kabul Anketi (CPAQ) ve başa çıkma stratejileri COPE envanteri kullanılarak değerlendirildi. **Sonuçlar:** Gruplar arasında, MHQ ve COPE puanları açısından kontrol grubu lehine anlamlı farklılıklar varken ($p<0.05$), CPAQ puanları açısından anlamlı fark yoktu ($p>0,05$). **Tartışma:** Çalışma sonuçları, disiplinler arası kronik ağrı yönetimi programlarında bedensel engelli bireylerde başa çıkma stratejilerinin dikkatli değerlendirilmesi ve kişiye uygun başa çıkma stratejilerinin müdehale programına dahil edilmesi konularına dikat çekmektedir.

Anahtar Kelimeler: Ağrı kabulü, Başa çıkma, Bedensel engel, Kronik ağrı, Kas-İskelet Sistemi Sağlık Durumu Anketi.

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According to the World Health Organization, disability is a condition of impairment, whether physical or mental, that hinders a person's ability to perform specific activities and interact with the surrounding world (WHO, 2001). individuals' abilities in areas such as movement, thinking, memory, learning, communication, hearing, mental health, or social relationships can be affected by different types of disabilities. Physical or bodily disability refers to the inability to perform or reduced performance of physical abilities due to any physical impairment or deficiency in human structure and form (Burcu, 2011). Physical disabilities can manifest as difficulties in gross motor skills like walking, challenges in fine motor skills such as writing or eating, altered muscle tone, or conditions involving the loss of one or more limbs or their inability to be used. It is known that approximately 10% of the world's population, and about 12% of our country's population, consists of individuals with disabilities (Burcu, 2011). Disability has been recognized as a global health priority by UNICEF, considering it as a subpopulation (Gottlieb et al., 2009).

Limited available literature indicates that individuals with physical disabilities tend to have worse physical and psychological health outcomes and weaker social support compared to control groups (Wilson et al., 2006). A common symptom experienced by individuals with physical disabilities is pain. While numerous studies have well-documented the significant physical, psychological, and social impacts of chronic pain on non-disabled individuals, there has been limited research conducted to understand the prevalence and effects of chronic pain in individuals with physical disabilities (Miró et al., 2016). Limited evidence suggests that individuals with physical disabilities may be at a higher risk for chronic pain. Considering the nature of physical disability, these individuals often report pain in multiple body regions (Ehde et al., 2003) (Miró et al., 2017). However, these studies are limited by small sample sizes and only encompass specific physical disabilities such as cerebral palsy and neuromuscular diseases (Findlay et al., 2016) (Engel et al., 2009).

The most comprehensive study in the literature on chronic pain in individuals with physical disabilities was conducted by Vega et al. This study is a comparative study that includes the prevalence of chronic pain and associated factors in individuals with and without physical disabilities. The study found that the prevalence of chronic pain in physically disabled adolescents was nearly twice as high as in healthy adolescents (27.2% vs. 15.1%). Additionally, it was determined that physically disabled individuals had higher levels of anxiety, depression, insomnia, and worse overall health compared to non-disabled individuals (De la Vega et al., 2018). However, generalizing this study to a broader age group is challenging since it was exclusively conducted on the adolescent population. Additionally, factors related to chronic pain, such as pain intensity and duration, were not addressed. The lack of research on chronic pain in individuals with physical disabilities in the literature is notable. Therefore, the aim of this study was to investigate the musculoskeletal health, pain acceptance, and coping strategies of individuals with chronic pain and physical disabilities, comparing them with non-disabled individuals. We hypothesized that there are differences between individuals with chronic pain and physical disabilities in terms of pain acceptance levels, health status and musculoskeletal health compared to those without disabilities.

METHODS

Study Design and Participants: This cross-sectional comparative study was conducted over a 12-week period, specifically from June 2022 to May 2023. The data collection process involved conducting face-to-face interviews. Prior to commencing the research, participants were provided with information, and all of them signed an informed consent form. The study adhered to the ethical standards for human research as outlined in the Helsinki Declaration.

Participants were divided into two groups: the study group, consisting of individuals with chronic pain and physical disabilities, and the control group, comprising individuals with chronic pain but no disabilities. For inclusion in the study group, participants had to be between 18 and 65 years old, have physical disabilities, experience chronic pain, and be at least literate. Chronic pain was defined according to the criteria established by Noel et al. (Noel et al., 2016), and physical disability was defined based on the criteria outlined by De la Vega et al. (De la Vega et al., 2018). Additionally, participants in the study group had to report a pain intensity level of at least 3 on the Visual Analog Scale (VAS) (Collins et al., 1997). Exclusion criteria for the study group included individuals with visual or auditory impairments beyond physical disabilities and those diagnosed with psychiatric disorders.

The control group consisted of individuals aged 18 to 65 with chronic pain and at least a literate level. Similar to the study group, chronic pain was defined

according to the criteria established by Noel et al. (Noel et al., 2016), and participants had to report a pain intensity level of at least 3 on the VAS. However, individuals with any form of disability or psychiatric diagnosis were not included in the control group.

Physical disabilities: Identification of physically disabled individuals was conducted using four screening questions. Individuals who answered "yes" to any of these questions were considered "physically disabled." This method for identifying physically disabled individuals was adopted from De la Vega et al. (De la Vega et al., 2018).

(1) Do you have difficulty using your hands, arms, legs, or feet due to a permanent physical condition?

(2) Do you use any of the following due to a permanent physical condition: a cane, crutches, a walker, medically prescribed shoes, a wheelchair, or any other device for walking?

(3) Do you use a brace for your hand, arm, leg, or foot due to a permanent physical condition?

(4) Do you use an artificial hand, arm, leg, or foot?

Chronic pain: Identification of individuals with chronic pain was done by asking participants about the localization of their pain in the past 12 months and having them rate the frequency of each pain. This rating system included categories such as "never," "only a few times," "approximately once a week," "almost every day," and "every day." Individuals who classified chronic pain as pain occurring "almost every day" or "every day" anywhere in their body and had been experiencing pain for at least 3 months were considered chronic pain sufferers. This method for coding chronic pain was used in physically disabled individuals by Noel et al. (Noel et al., 2016).

Assessment Tools

The data were collected through face-to-face interviews conducted by the researchers. Initially, descriptive information, pain duration, and pain type were verbally queried from the participants. Subsequently, participants were asked to complete the VAS, Musculoskeletal Health Questionnaire (MHQ), Chronic Pain Acceptance Questionnaire (CPAQ), and COPE inventory in a sequential manner. These measurement instruments are used in individuals with physical disabilities and are known for their robust psychometric properties.

VAS: It is a simple, effective, valid, and reliable tool used to assess pain intensity. During VAS application, individuals are asked to mark their pain intensity on a 10 cm scale where "0" represents no pain, and "10" represents unbearable pain (Collins et al., 1997).

MHQ: It was developed to obtain a comprehensive assessment approach in individuals with musculoskeletal disorders (Hill et al., 2016). It contains short and easily understandable items. The questionnaire assesses the pain/stiffness condition (day and night), physical function (dressing and walking), impact on symptom-related work/daily life and social activities/hobbies, level of physical activity, sleep status, fatigue, emotional well-being, understanding of diagnosis and treatment, and the overall impact of the disease, consisting of 14 items in total. Each item is scored on a five-point Likert scale. The total score ranges from 0 to 56, with 0 indicating the worst health condition and 56 indicating the best health condition. It is filled out by the patient and inquiries about the patient's overall health status in the past two weeks (Akkubak & Külünkoğlu, 2020).

CPAQ: It is the most commonly used questionnaire to assess pain acceptance. It consists of 20 items, each scored on a scale from 0 (never true) to 6 (always true). The total score ranges from 0 to 120, with a high score indicating high pain acceptance. It comprises two subscales: the Pain Willingness subscale, which assesses the extent to which an individual believes that attempting to control the experience of chronic pain is a necessary strategy for living a better life, and the Activity Engagement subscale, which assesses the extent to which an individual engages in daily activities despite the presence of chronic pain (Akmaz et al., 2018).

COPE: The COPE inventory consists of 60 questions and 15 subscales, with each subscale providing information about a different coping strategy. The higher the scores obtained from the subscales, the more a particular coping strategy is used by the individual. The scale was revised in 2003 into five factors and 40 items as COPE-R. And COPE-R Turkish Version can be used of 5 subscale (self-help, approach, accommodation, avoidance, and self-punishment), 32 items of which values are evaluated according to 4 point Likert-type scale. (Dicle et al., 2015).

Statistical Analysis

The research involved 88 participants, encompassing individuals with and without physical disabilities. Post hoc power analysis conducted using the G-Power program revealed that the study's power was 84%, based on a 95% confidence interval, a significance level of 0.05, and an effect size of 0.63 (determined from MHQ values). This power level suggests that the study possessed adequate statistical power to detect significant effects under the specified conditions.

The data were analyzed using the SPSS (Statistical Package for Social Sciences) 20 software. Results were presented as mean ± standard deviation for quantitative data and as frequencies (percentages) for categorical data. To compare between the study group and the control group, independent sample t-tests were used for parametric data (COPE and MHQ), and Mann-Whitney U tests were used for non-parametric data (VAS and CPAQ). A statistical significance level was considered as $p < 0.05$.

RESULTS

Overall, 88 individuals were enrolled in the study, with 44 allocated to the study group and 44 to the control group. The groups demonstrated homogeneity regarding age, education level, marital status, income and medication ($p>0.05$). However, significant differences were observed between the groups in terms of gender, employment status, and residency ($p<0.05$). Specifically, the control group had a higher proportion of women, while men were predominant in the study group. Retirees constituted the majority in the study group, whereas homemakers were the main demographic in the control group. Additionally, urban residents were more prevalent in the study group compared to the control group. Further details on the demographic characteristics of the participants are presented in Table 1. The study found no differences between groups based on physical disability categories. The physical disability categories of the groups are presented in Table 2.

Table 1. Overview of the demographic characteristics of groups.

		Study Group (n=44)	**Control Group (n=44)**	
		Mean ± SD	**Mean ± SD**	**P value**
Age (years)		42.09 ± 15.3	38.43 ± 14.9	0.224[1]
BMI (kg/m^2)		25.51 ± 4.8	25.09 ± 5.0	0.681[1]
		n (%)	**n (%)**	
Gender	Female	15 (34%)	30 (68%)	χ2=10.233
	Male	29 (68%)	14 (32%)	**0.001**
Educational level	Primary school	11 (25%)	10 (23%)	χ2=2.339
	Collage	11 (25%)	8 (18%)	0.505
	Graduate	19 (43%)	25 (57%)	
	Post graduate	3 (7%)	1 (2%)	
Employment level	None	13 (30%)	2 (5%)	χ2=27.977
	Student	3 (7%)	9 (20%)	**<0.001**
	Homemaker	0 (0%)	11 (25%)	
	Worker	3 (7%)	7 (16%)	
	Official	11 (25%)	10 (22%)	
	Retired	14 (31%)	5 (11%)	
Marital status	Single	30 (68%)	21 (48%)	χ2=3.777
	In a relationship	14 (32%)	23 (52%)	0.052
Income	Low	10 (23%)	14 (32%)	χ2=0.921
	Middle	15 (34%)	13 (29%)	0.631
	High	19 (43%)	17 (39%)	
Residency	Rural	6 (14%)	19 (43%)	χ2=9.443
	Urban	38 (86%)	25 (57%)	**0.002**
Medication	None	14 (32%)	16 (36%)	χ2=2.991
	Generally	23 (52%)	26 (59%)	0.265
	Rarely	7 (16%)	2 (5%)	

SD: Standart Deviation; BMI: Body Mass Index, χ2=Chi-quare; 1independent sample t test.

Table 2. Physical disability categories of groups.

Physical Disability Categories	Study Group (n=44) n (%)	Control Group (n=44) n (%)	P value
(1) Do you have difficulty using your hands, arms, legs, or feet due to a permanent physical condition?	12 (27.3%)	13(29.5%)	
(2) Do you use any of the following due to a permanent physical condition: a cane, crutches, a walker, medically prescribed shoes, a wheelchair, or any other device for walking?	14(31.8%)	15(34.0%)	$\chi 2$=2.018 0.565
(3) Do you use a brace for your hand, arm, leg, or foot due to a permanent physical condition?	18 (40.9%)	16(36.3%)	
(4) Do you use an artificial hand, arm, leg, or foot?	0	0	

$\chi 2$=Chi-quare

Although there was a notable difference among the groups concerning pain duration, MHQ, and COPE scores ($p < 0.05$), favoring the control group, no significant difference was observed regarding pain intensity, pain type, and CPAQ scores ($p > 0.05$). Furthermore, after adjusting for covariates like gender, employment level, residency, and pain duration, the results remained consistent in the univariate analysis. A detailed comparison of groups based on clinical characteristics is outlined in Table 3.

Table 3. Clinical characteristics of groups.

	Study Group (n=44)	Control Group (n=44)	
	Mean ± SD	**Mean ± SD**	**P value**
Pain Duration (month)	91.81 ± 102.17	29.16 ± 46.04	**<0.001[1]**
VAS_Rest	5.05 ± 2.97	4.25 ± 2.39	0.179[1]
VAS_Activity	6.43 ± 2.41	6.23 ± 1.61	0.247[1]
Pain Type	**n (%)**	**n (%)**	
Continuous	9 (20%)	7 (16%)	0.306[1]
Increase or decrease	35 (80%)	37 (84%)	0.580[1]
MHQ	26.84 ± 12.03	33.23 ± 7.42	**0.004[2]**
CPAQ_Total	62.23 ± 16.04	61.43 ± 17.15	0.815[1]
CPAQ_Pain	25.20 ± 16-5.72	21.68 ± 9.85	0.465[1]
CPAQ_Activity	36.98 ± 18.01	39.98 ± 10.10	0.786[1]
COPE	84.59 ± 18.97	99.57 ± 13.56	**<0.001[2]**

SD: Standard Deviation; MHQ: Musculoskeletal Health Questionnaire; CPAQ: Chronic Pain Acceptance Questionnaire; COPE: Coping Inventory. 1Mann-Whitney u test; 2 Independent sample t test.

DISCUSSION

This study compares, for the first time, the pain acceptance, musculoskeletal health status, and coping strategies of individuals with physical disabilities and chronic pain with those of individuals with chronic pain but without disabilities. Individuals with chronic pain who also have physical disabilities demonstrated poorer perceptions of musculoskeletal health and coping strategies compared to those with chronic pain but without disabilities. However, their levels of pain acceptance were similar.

Pain acceptance is a theoretical concept that deals with how individuals respond to chronic pain and adapt to it. It requires reducing unsuccessful attempts to prevent or control chronic pain and instead focusing on participating in daily activities and pursuing personal goals (McCracken, 1998). Numerous studies have shown that better pain acceptance in individuals with chronic pain is associated with improved functionality and less distress, ultimately helping to enhance their quality of life and social participation (Gatchel et al., 2014; Jakobsson et al., 2003; Smith et al., 2001; Turk et al., 2011). However, all of these established findings relate to non-disabled individuals. There is currently no published literature on how physically disabled individuals respond to or adapt to chronic pain. Although pain acceptance is largely influenced by the severity and duration of pain, it is surprising and significant that, in the current study, disabled individuals exhibited similar pain acceptance to non-disabled individuals despite having longer pain duration and worse musculoskeletal health. This suggests that disabled individuals may develop a greater willingness to accept pain as a result of the process of adapting to living with a disability.

Pain acceptance is becoming an increasingly important behavioral response in chronic pain, and as such, pain intervention programs include acceptance and commitment therapy (Hugles et al, 2017). High levels of acceptance may lead to fewer psychological distress associated with chronic pain. Therefore, the fact that pain acceptance in physically disabled individuals is similar to that in the control group is a positive outcome. The relatively better pain acceptance, weaker coping behavior, and perception of musculoskeletal health in physically disabled individuals suggest a need to reconsider the focus of chronic pain intervention programs for these individuals.

Coping can be primarily defined as an effort to manage stressful events and is a natural response aimed at reducing the negative impacts of pain, such as its severity or effects on functionality. As stated by Jensen et al., numerous coping strategies and pain-related beliefs have been identified (Jensen et al., 2011). Coping strategies of physically disabled individuals have also been extensively examined in previous studies. It is known that physically disabled individuals adopt less adaptive coping strategies compared to non-disabled individuals in these studies (Kara & Açıkel, 2012; Livneh & Martz, 2014). The results of the current study confirm this information. In presnt study, the pain duration of disabled individuals was longer than that of the control group. However, even when pain duration was corrected as a covariate, the results remained unchanged. This indicates the need to focus on developing coping strategies in chronic pain management programs for physically disabled individuals (Stanos, 2012).

The present study has certain limitations that should be considered when interpreting the results. Firstly, the use of cross-sectional data restricts the ability to establish cause-and-effect relationships. Secondly, the exclusion of common psychological issues associated with chronic pain, like depression and anxiety, is another limitation. However, it's well-established that chronic pain and psychological stress are common, making it challenging to generalize the results to individuals with chronic pain and disabilities.

In conclusion, chronic pain and its impacts present a noteworthy concern among individuals with physical disabilities, primarily because they demonstrate less effective coping strategies in comparison to their counterparts without disabilities who also have chronic pain. The distinctive characteristics of this particular population, alongside identifiable risk factors and their association with chronic pain, underline the necessity for further in-depth research. Such research endeavors could potentially pave the way for the development and evaluation of novel therapeutic interventions tailored to address the unique requirements and challenges faced by individuals with physical disabilities experiencing chronic pain.

Ethical Approval

Ethical approval for the study was obtained from the Ethics Committee of Muğla University Health Sciences (Protocol no: 210069, Decision no:27).

Authors' Contribution

Design: MK, AES, Data Collection: AES, Analysis: MK, Article Writing: MK, KB.

Conflicts of Interest Statement

There are no conflicts of interest.

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Kaynaklar

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