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# Investigation of the Relationship between Emotional Intelligence and Quality of Life, and Depression, Anxiety, and Stress in Patients with Osteoarthritis

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## Abstract

**Objective:** Osteoarthritis (OA) is one of the most common chronic diseases of the musculoskeletal system. The aim of this study is to investigate the relationship between emotional intelligence and quality of life, and depression anxiety stress in patients with OA. **Methods:** This study was carried out in 61 patients with OA, aged 35-67 years, OA diagnosis follow-up, who applied to the physical therapy and rehabilitation unit of State Hospital. In addition to sociodemographic characteristics of patients with OA who volunteered to participate in the study, the information including the answers they gave for the emotional intelligence scale, quality of life questionnaire and depression anxiety stress scale was recorded.

**Result:** A positive, statistical relationship was found between the emotional intelligence and the quality of life ($p<0.05$). Similarly, a negative, statistical correlation was found between emotional intelligence and depression and stress ($p<0.05$).

**Conclusion:** As the emotional intelligence of the patients increases, their negative emotional states decrease and their quality of life increases. Thus, it can be said that a patient with OA with a higher emotional intelligence level will have a lower risk of developing negative moods and have a better quality of life.

**Keywords:** Anxiety, Emotional Intelligence, Mood, Quality of life

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# Osteoartritli Hastalarda Duygusal Zekâ ile Yaşam Kalitesi ve Depresyon, Anksiyete ve Stres Arasındaki İlişkinin İncelenmesi

**Öz**

**Amaç:** Osteoartrit (OA), kas-iskelet sisteminin en sık görülen kronik hastalıklarından biridir. Bu çalışmanın amacı OA hastaların duygusal zeka ile yaşam kalitesi ve depresyon anksiyete stresi arasındaki ilişkiyi araştırmaktır.

**Yöntemler:** Bu çalışma, Devlet Hastanesi fizik tedavi ve rehabilitasyon ünitesine başvuran, OA tanısı ile takip edilen, yaşları 35-67 arasında değişen 61 OA hastası üzerinde gerçekleştirildi. Çalışmaya katılmaya gönüllü olan OA'li hastaların sosyodemografik özelliklerinin yanı sıra duygusal zeka ölçeği, yaşam kalitesi anketi ve depresyon anksiyete stres ölçeğini içeren bilgileri kaydedildi.

**Bulgular:** Duygusal zeka ile yaşam kalitesi arasında pozitif yönde istatistiksel olarak bir ilişki olduğu bulundu ($p<0.05$). Benzer şekilde, duygusal zeka ile depresyon, stres arasında negatif yönde, istatistiksel olarak bir ilişki bulundu ($p<0.05$).

**Sonuç:** Hastaların duygusal zekaları arttıkça olumsuz duygu durumları azalmakta ve yaşam kaliteleri artmaktadır. Böylece duygusal zeka düzeyi yüksek olan OA'li bir hastanın olumsuz duygu durum geliştirme riskinin daha düşük olacağı ve daha iyi bir yaşam kalitesine sahip olacağı söylenebilir.

**Anahtar kelimeler:** Duygusal zeka, Osteoartrit, Duygu durum, Yaşam kalitesi, Stres.

## INTRODUCTION

Osteoarthritis (OA) is one of the most common chronic diseases of the musculoskeletal system. More specifically, it is a disease characterized by progressive cartilage tissue destruction that causes limitation in joint range of motion, chronic pain, and muscle atrophy[1,2]. This disease, which usually involves the load-bearing joints, is shown as the leading cause of disability in patients over 60 years of age, and its prevalence tends to increase with the increase in life expectancy[1]. In addition to reducing the quality of life in patients with OA, pathological symptoms cause negative mood states such as anxiety and depression, and they harm the maintenance of well-being[3]. Moreover, the continuous perception of symptoms negatively affects the quality of life of patients with OA by hindering their ability to perform daily life activities, sleep quality, mental health, social relationships, and professional responsibilities[4]. On the other hand, it is stated that emotional intelligence in patients with chronic diseases is an important factor that helps individuals feel better physically and psychologically and to overcome the psychological effects of the disease[5,6]. Thus, it is suggested that emotional intelligence can act as a protective buffer against chronic health problems in elderly patients [5] and increase the quality of life[7].

Emotional intelligence is defined as the ability to recognize and understand our own emotions and those of others, to motivate ourselves, and to manage our emotions properly within ourselves and in our relationships. In addition, emotional intelligence is explained as the abilities and skills of "activating oneself, staying on track despite setbacks, controlling emotions, regulating mood, not allowing troubles to prevent thinking, putting oneself in the shoes of others, and having hope"[8]. It has been reported that emotional intelligence has a positive relationship with mental health, psychological well-being, and life satisfaction, as well as positively affecting quality of life and life satisfaction[9]. From this point of view, emotional intelligence is an important strategy in terms of reducing stress factors and providing the strength to cope with and endure difficulties in life through emotion regulation[10].

Disease symptoms, particularly chronic pain, in patients with OA adversely affect their daily living activities, sleep quality, mental health,

social relations and quality of life [4]. In a recent study, patients with OA may develop negative mood states, such as depression more likely up to four times due to disease symptoms. In addition, the quality of life is seriously reduced due to negative mood in these patients [5]. On the other hand, it is stated that emotional intelligence is an important factor that helps individuals with chronic illness symptoms to feel better physically and psychologically and to overcome the psychological effects of the illness [5, 6]. Therefore, emotional intelligence in patients with OA can improve the quality of life by reducing the harmful effects of negative emotions provoked by the disease and turning them into positive effects.

Although there are studies investigating the relationship between emotional intelligence, quality of life [7, 11-13] and mood in many chronic diseases [13-15], no study has been found in patients with OA in the relevant literature. Therefore, the research questions that guide this study are as below:

i) Is there a relationship between emotional intelligence and quality of life in patients with OA?

ii) Is there a relationship between emotional intelligence and mood (depression, anxiety, stress) in patients with OA?

## METHODS

This study was carried out in patients diagnosed with OA who applied to the physical therapy and rehabilitation unit of Muş State Hospital. Muş state hospital is a 445-bed health institution that provides outpatient and/or inpatient diagnosis, treatment and/or rehabilitation services and is classified as 2nd step according to the Ministry of Health. Ethics committee approval was obtained on 27.10.2021 from Muş Alparslan University, Non-Interventional Clinical Research Ethics Committee with the decision numbered 27735 and 11-32.

### Participants

Our study was carried out with 61 patients with OA diagnosis (individuals who applied to the outpatient clinic with symptomatic complaints were diagnosed with osteoarthritis by a physical therapy and rehabilitation physician in line with their physical and radiological findings), aged 35-67 years, follow-up, who applied to the physical therapy and rehabilitation unit of Muş State Hospital. The 3.1.9.4 version of the G*Power program (Heinrich-Heine-Universität Düsseldorf, Germany) was used to determine the sample size of the study [16]. A total of 61 patients with OA were included in the study, with the power ratio of the sample calculated based on similar articles [7], with β = 80% and α=0.05. The inclusion criteria of the study were determined as having a diagnosis of OA, volunteering to participate in the study, and not having a physical or mental disability that would prevent communication. Patients who did not meet the inclusion criteria (rheumatoid arthritis, fibromyalgia…) were excluded from the study (Figure 1).

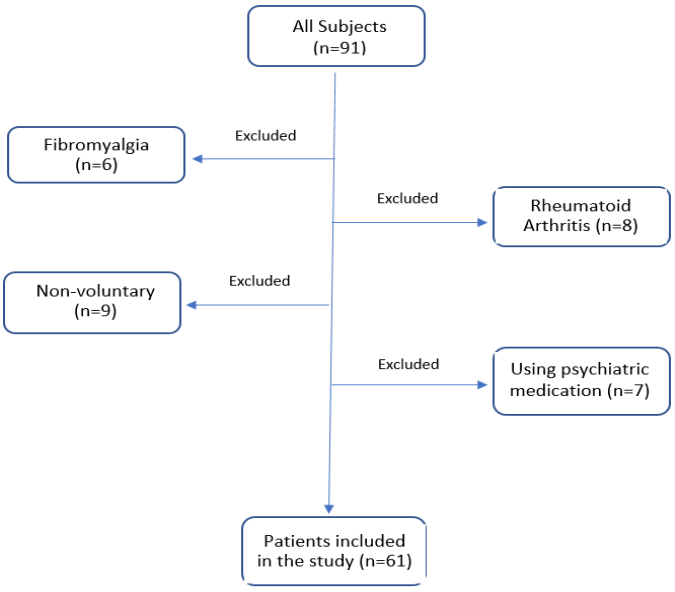


**Figure 1:** Recruitment process to the study

## Evaluation Criteria

In addition to demographic information such as physical and sociodemographic characteristics (age, gender, height, weight, occupation, education level…) of patients with OA who volunteered to participate in the study, the information including the answers they gave for the emotional intelligence scale, quality of life questionnaire, and depression anxiety stress scale was recorded. The scales, which lasted approximately 15-20 minutes to fill in total, were carried out through mutual interviews between 27/10/2021 and 01/12/2021.

## Emotional Intelligence Scale

The emotional intelligence scale was developed by Petrides and Furnham and originally consisted of 30 items[17]. The scale, which was validated in Turkish by Deniz et al., was reduced to 20 items[18]. There are 20 items in the scale regarding the five dimensions of emotional intelligence (well-being, self-control, emotionality, sociability, and total emotional intelligence). In the scale, Likert type scoring is made from "strongly disagree" to "strongly agree". High scores mean high emotional intelligence feature[18,19]. In the current study, the Cronbach's alpha coefficients for the sub-dimensions of the emotional intelligence scale were found to be 0.74 for the well-being, 0.71 for self-control, 0.67 for emotionality, 0.68 for sociability, and 0.81 for total emotional intelligence, respectively.

## Life Quality Questionnaire

The health-related quality of life was assessed by the Turkish version of Short Form 36 (SF-36)[20]. The SF-36 is Likert-type questionnaire consists of eight subscales as follows: physical functioning, social functioning, role limitations due to physical problems, role limitations due to emotional problems, mental health, vitality (energy), bodily pain, and general health. The scores range from 0-100 and a higher score indicates a better health level[20]. In our study, Cronbach's alpha values, which are the reliability coefficients of the sub-dimensions of the SF-36 questionnaire, were found to vary between 0.72 and 0.91.

## Depression, Anxiety and Stress Scale

Depression, Anxiety and Stress Scale-21 (DASS-21) consists of three sub-categories as depression, anxiety and stress[21]. DASS-21 and abbreviation of DASS-42 was created by Lovibon [22]. Each category consists of 7 separate questions and the scale includes[21] questions in total. In the questionnaire, each sub-question is scored according to the 4-point Likert system (0: never, 4: always); and all the scores are added. It indicates that the person with a higher score suffers from more severe emotional distress. Turkish validity and reliability study of the DASS-21 scale was conducted[21].In this study, Cronbach's alpha coefficients for DASS-21 sub-dimensions were found to be 0.82 for depression, 0.78 for anxiety and 0.73 for stress, respectively.

## Statistical Analysis

Statistical analyzes were performed using “IBM® SPSS© 24 software”. The suitability of numerical variables to the normal distribution was checked using visual (histogram and probability graphs) and analytical methods (Kolmogorov-Smirnov). Descriptive statistics for numerical variables with normal distribution were given with mean and standard deviation, while descriptive statistics for categorical variables were given using numbers and percentages. It was observed that emotional intelligence, quality of life and depression, anxiety, and stress data, which were the dependent variables of the study, did not have a normal distribution. Descriptive analyzes were performed by applying frequency analysis to variables such as age, gender, height, weight, occupation, education level, which are physical and socio-demographic characteristics. The relationship

between emotional intelligence sub-parameters and quality of life sub-parameters, and the relationship between emotional intelligence sub-parameters and depression, anxiety and stress were calculated with the Spearman test used for data that did not have normal distribution. The degree of correlation is a low one between 0.05-0.4. According to the correlation coefficient; 0.4-0.7 was interpreted as moderate correlation and 0.7-1.0 as high correlation[23]. Statistical significance level was accepted as $p<0.05$.

## RESULTS

The sociodemographic characteristics of the patients with OA included in the study are given in Table 1.

The table shows that the mean age of the patients with OA included in the study was 49.2 ± 8.7. It was observed that 59% of the patients were women, and 54% of them were primary school graduates. In addition, the averages of other sociodemographic data are given (Table 1).

**Table I:** The sociodemographic characteristics of the patients with OA included in the study

| | | Mean | SD |
|---|---|---|---|
| Age (year) | | 49.2 | 8.7 |
| Weight (kg) | | 169.4 | 8.1 |
| Height (cm) | | 80.3 | 13.1 |
| | | **n** | **%** |
| Gender | Male | 25 | 41.0 |
| | Female | 36 | 59.0 |
| Occupation | Officer | 4 | 6.6 |
| | Retired | 17 | 27.9 |
| | Self-employment | 3 | 4.9 |
| | Other | 37 | 60.7 |
| Education Level | Primary school | 33 | 54.1 |
| | Middle School | 6 | 9.8 |
| | High school | 19 | 31.1 |
| | Licence | 3 | 4.9 |
| | Postlicence | 0 | 0.0 |
| Marital Status | Married | 49 | 80.3 |
| | Single | 12 | 19.7 |
| Smoking | Yes | 25 | 41.0 |
| | No | 36 | 59.0 |
| Alcohol use | Yes | 4 | 6.6 |
| | No | 57 | 93.4 |

*SD; Standard deviation*

The relationship between emotional intelligence and quality of life of patients with OA who were included in the study is given in Table 2.

**Table II:** The relationship between emotional intelligence and quality of life of patients with OA who were included in the study

| | | | Emotional intelligence | | | | |
|---|---|---|---|---|---|---|---|
| | | | Well-Being | Self-Control | Emotionality | Sociability | Total |
| Quality of Life | Physical functioning | r | 0,420 | 0,140 | 0,136 | 0,104 | -0,022 |
| | | p | **0,001** | 0,282 | 0,296 | 0,425 | 0,864 |
| | Physical role limitation | r | 0,205 | -0,009 | 0,031 | -0,107 | -0,113 |
| | | p | 0,113 | 0,942 | 0,814 | 0,413 | 0,387 |
| | Emotional role limitation | r | 0,041 | 0,095 | -0,033 | 0,041 | -0,176 |
| | | p | 0,751 | 0,468 | 0,800 | 0,752 | 0,176 |
| | Vitality (energy) | r | 0,126 | -0,071 | 0,094 | 0,015 | -0,136 |
| | | p | 0,335 | 0,586 | 0,469 | 0,909 | 0,295 |
| | Mental health | r | 0,429 | 0,142 | 0,421 | 0,395 | 0,265 |
| | | p | **0,001** | 0,275 | **0,001** | **0,002** | **0,039** |
| | Social functioning | r | 0,507 | 0,003 | 0,228 | 0,223 | 0,074 |
| | | p | **0,000** | 0,984 | 0,077 | 0,084 | 0,572 |
| | Bodily pain | r | 0,097 | -0,153 | 0,143 | 0,176 | 0,047 |
| | | p | 0,455 | 0,240 | 0,270 | 0,175 | 0,722 |
| | General health | r | 0,704 | 0,221 | 0,249 | 0,261 | -0,016 |
| | | p | **0,000** | 0,087 | 0,053 | **0,042** | 0,905 |

*r; Spearman correlation test, OA; osteoarthritis*

The table shows that there is a positive, moderate statistical relationship between the "well-being" sub-parameter of emotional intelligence and "physical functioning", "mental health", "social functioning" and "general health" sub-parameters of the quality of life.

A positive, low-moderate statistical relationship was found between the "emotional", "sociability" and "total" sub-parameters of emotional intelligence and the "mental health" sub-parameter of quality of life in patients with OA ($p<0.05$). Similarly, a positive and low statistical correlation was found between “sociability”, which is the emotional intelligence sub-parameter of the patients, and the “general

health" sub-parameter of quality of life ($p<0.05$).

The relationship between the emotional intelligence of patients with OA and depression, anxiety and stress is given in Table 3.

**Table III:** The relationship between the emotional intelligence of patients with OA and depression, anxiety and stress

| | | | Mood | | |
|---|---|---|---|---|---|
| | | | Depression | Anxiety | Stress |
| Emotional intelligence | Well-Being | r | -0.261 | -0.143 | -0.002 |
| | | p | **0.042** | 0.273 | 0.986 |
| | Self-Control | r | -0.296 | -0.194 | -0.266 |
| | | p | **0.020** | 0.135 | **0.038** |
| | Emotionality | r | -0.369 | 0.011 | -0.477 |
| | | p | **0.003** | 0.933 | **0.000** |
| | Sociability | r | -0.368 | -0.059 | -0.431 |
| | | p | **0.003** | 0.650 | **0.001** |
| | Total | r | -0.272 | -0.175 | -0.258 |
| | | p | **0.034** | 0.176 | **0.045** |

*r; Spearman correlation test, OA; osteoarthritis*

The table illustrates that there was a negative, low statistical correlation between the patients' emotional intelligence (for all sub-parameters) and depression ($p<0.05$). Similarly, except for "well-being" sub-parameter of the emotional intelligence of the patients ($p>0.05$), a negative and low-moderate statistical relationship was found between other sub-parameters and stress ($p<0.05$).

## DISCUSSION

In the study where we investigated the relationship between emotional intelligence, quality of life and mood (depression, anxiety and stress) in patients with OA, relationships were found between emotional intelligence, quality of life and mood in patients with OA. As the emotional intelligence of the patients increases, their negative emotional states decrease and their quality of life increases. Our study has the advantage of being the first study to reveal the relationship between emotional intelligence, quality of life and mood in patients with OA.

Schutte states that higher emotional intelligence is associated with better health[24]. There are studies showing this relationship in different patients with chronic disease. In an observational study conducted to compare quality of life and emotional intelligence between type 2 diabetes patients and healthy patients, it was found that patients with type 2 diabetes had a statistically lower quality of life, physical health, and emotional intelligence than patients without this disease[11]. In another study comparing emotional intelligence training in Type 2 diabetes patients compared to the healthy control group, it was observed that after 12 weeks of emotional intelligence training, the patients' quality of life, emotional intelligence levels and mental well-being levels increased statistically[25]. Similarly, a 12-week emotional intelligence training program was found to increase the quality of life in both the control group and hemodialysis patients[12]. In another study examining the relationship between quality of life and emotional intelligence level in cancer patients, it was found that emotional intelligence was positively related to different sub-dimensions of quality of life (emotional, social functioning, mental health, vitality)[7]. In the same study, it is suggested that high emotional intelligence can increase the quality of life by reducing the harmful effects of negative emotions provoked by the disease and turning them into positive effects[7].

Consistent with the above studies, this study showed that there are positive relationships between emotional intelligence and the sub-parameters of "physical functioning", "mental health", "Social functioning" and "general health", which are the sub-parameters of quality of life in patients with OA.

Emotional intelligence deficiency can negatively affect daily life at many points by causing

depression, eating disorders, aggression and committing crimes[8]. From the other point of view, emotional intelligence is shown as an important factor that helps the individual feel better and overcome the psychological effects caused by the disease[10]. In a study conducted in patients with rheumatoid arthritis (RA), it was reported that patients with RA had lower emotional management and stress management than the healthy group[15]. In a study conducted on 228 patients diagnosed with esophageal and gastritis cancer, it was reported that there was a relationship between negative mood (depression, anxiety) and quality of life in patients with high emotional intelligence. In other words, it has been reported that individuals who use their emotional intelligence in daily life exhibit lower negative mood and better quality of life[13]. Emotional intelligence was found to be inversely correlated with depression and anxiety in women with breast cancer[14] and in patients with urological cancer[26]. Similarly, in a study that aimed to determine the relationship between emotional intelligence and stress, anxiety and depression on medical school students, they showed that high emotional intelligence was associated with low stress, anxiety and depression[27]. In our study, negative relationships were determined between the emotional intelligence of patients with OA and depression and stress.

In general, it is observed that patients with OA who recognize and understand their own and others' emotions, can motivate themselves, get rid of negative emotions, have good interpersonal relationships and can lead a social life, exhibit less negative mood and better quality of life.

Our study has some limitations. First, there was no control group in the study and the dependent variables of the OA group could not be compared with the healthy group. A second limitation is that our study was limited to the state hospital in the province where we are located and that patients from other provinces could not be included in the study due to limited opportunities.

## CONCLUSION

Relationships were found between emotional intelligence, quality of life and mood in patients with OA. As the emotional intelligence of the patients increases, their negative emotional states decrease and their quality of life increases. Thus, it can be said that a patient with OA with a higher emotional intelligence level will have a lower risk of developing negative moods and have a better quality of life.

Clinicians working with OA patients can be supported in terms of emotional intelligence training programs to both increase their own emotional intelligence and increase the patient's emotional intelligence by considering the relationship of emotional intelligence with quality of life and negative mood.

**Ethics Committee Approval:** Ethics committee approval was obtained on 27.10.2021 from Muş Alparslan University, Non-Interventional Clinical Research Ethics Committee with the decision numbered 27735 and 11-32.

**Conflict of Interest:** The authors declared no conflicts of interest.

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