

# Anxiety, Depression, Problem Solving and Stress Management in Patients with Ankylosing Spondylitis

## Ankilozan Spondilit Hastalarında Anksiyete, Depresyon, Problem Çözme ve Stresle Başa Çıkma

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### Keywords

Ankylosing spondylitis, depression, coping, problem solving, anxiety

### Anahtar Kelimeler

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### Abstract

**Objective:** This study aims to determine anxiety, depression, self-esteem, stress management and problem solving skills in ankylosing spondylitis (AS) patients compared to healthy subjects.

**Materials and Methods:** The study involves 33 patients with AS according to the Modified New York Criteria and 31 healthy subjects as control group. A socio-demographic data form, the Hospital Anxiety and Depression Scale (HADS), the Rosenberg Self-Esteem Scale (RSES), the Problem Solving Inventory (PSI) and the Coping Orientation to Problems Experienced (COPE) scale were used to evaluate participants

**Results:** The mean ages of the patients and the control were  $36.3 \pm 10.9$  and  $33.6 \pm 6.2$  years respectively with no significant difference between the two groups ( $p > 0.05$ ). On the HADS scale, AS patients showed significantly higher anxiety and depression scores ( $p < 0.05$ ). AS patients had significantly lower self-esteem as determined by the RSES scores ( $p < 0.05$ ). When the study groups were compared using the PSI, a significant difference was observed only in the "approach-avoidance style" subscale. A positive correlation between Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) and RSES was reported and there was a very strong negative correlation between BASDAI and overall PSI scores. A negative correlation was found between humor, mental disengagement and behavioral disengagement and BASDAI scores ( $p < 0.05$ ).

**Conclusion:** Being a chronic rheumatic disease, AS not only limits daily living activities due to its physical manifestations but also causes psychological problems such as depression ve anxiety. However, it does not seem to impair problem solving skills and the ability to cope with stress significantly. It might be helpful to evaluate AS patients using a holistic approach and to be aware of the factors that are associated with difficulties in their social interactions.

### Öz

**Amaç:** Bu çalışmada amacımız ankilozan spondilit (AS) hastalarında anksiyete, depresyon, benlik saygısı, problem çözme ve stresle başa çıkma yeteneklerini incelemektir.

**Gereç ve Yöntemler:** Çalışmaya Modifiye New York Kriterlerine göre AS tanısı konan 33 hasta ile 31 sağlıklı gönüllü alındı. Katılımcılara sosyo-demografik veri formu, Hastane Anksiyete ve Depresyon Ölçeği (HADÖ), Rosenberg Benlik Saygısı Ölçeği (RBSÖ), Problem Çözme Envanteri (PÇE) ve Başa Çıkma Tutumları Değerlendirme Ölçeği (BÇTDÖ) uygulandı.

**Bulgular:** Katılımcıların yaş ortalamaları  $36,3 \pm 10,9$  olup kontrol grubunda  $33,6 \pm 6,2$  idi ve gruplar arasında anlamlı farklılık yoktu ( $p > 0,05$ ). Gruplar HADÖ ölçeğine göre karşılaştırıldığında, AS hastalarında anksiyete ve depresyon skorları anlamlı olarak daha yüksek saptandı ( $p < 0,05$ ). AS hastalarında RBSÖ'ye göre benlik saygıları anlamlı olarak daha düşüktü ( $p < 0,05$ ). Gruplar PÇE'ye göre kıyaslandığında sadece "kaçınan yaklaşım" alt skalasında anlamlı farklılık tespit edildi. Bath Ankilozan Spondilit Hastalık Aktivitesi Ölçeği (BASDAI) ile RBSÖ arasında pozitif korelasyon saptanırken, PÇE toplam puanları ile çok güçlü negatif korelasyon saptandı. BÇTDÖ'ye göre ise; şakaya vurma (mizaha vurma), zihinsel boş verme ve davranışsal boş verme ile negatif korelasyon saptandı ( $p < 0,05$ ). **Sonuç:** Kronik romatolojik bir hastalık olan AS sadece fiziksel belirtilerle yaşamı sınırlandıran bir hastalık değil aynı zamanda depresyon ve anksiyete gibi ruhsal durumlara yol açmaktadır, benlik saygısını azaltabilmektedir; ancak stresle başa çıkma ve problem çözme yeteneğini çok fazla etkilememektedir. Bu nedenle AS hastaları bütüncül bir yaklaşımla değerlendirilmeli ve bu hastaların sosyal iletişimlerini zorlaştıran etkenler hakkında duyarlı ve dikkatli olunmalıdır.

## Introduction

As a chronic rheumatic condition, ankylosing spondylitis (AS) especially affects axial skeleton and restricts spinal mobility over the disease continuum.

AS may trigger pain and inflammation in the fibro-osseous junctions, joints and vertebra. Consequently, it is associated with impaired physical functioning such as reduced spinal mobility, stiffness, fatigue, sleep disorders as well as psychological problems including depression, anxiety and stress. The goal of treatment is to relieve pain and stiffness, prevent postural deformities and maintain physical and psychological well-being (1-4).

Since AS is a chronic and progressive disease that leads to deformities and functional disability, patients may experience some psychiatric symptoms. In a study by Martindale et al. (2), it was underscored that assessment of psychological status over the course of the disease is equally important as clinical evaluation of the condition. Psychiatric symptoms that most commonly occur in AS patients include anxiety and depression. Depression and anxiety have been reported in 28% to 32% of patients with AS (5,6). In another study, approximately one-third of AS patients reported a high level of depressive symptoms (7). Additionally, there are numerous studies that measured the quality of life as well as anxiety and depression in AS patients (5-9).

Given the chronic nature of AS and progressive disability and psychiatric problems associated with AS, these patients would inevitably encounter some difficulties in their daily living activities. Accordingly, it might be challenging for AS patients to cope with stressful life events and daily problems.

Coping is defined as all cognitive, emotional and behavioral responses exhibited by individuals in order

to resist and tolerate stressful events or factors when confronted with such situations (10). Failure of an individual to fulfill psychological, physical and social functions results in developing some sort of coping strategies for minimizing the negative consequences of their disease that are consistent with their culture and value system (10,11). Identification of coping strategies used by an individual to respond to stress factors might assist in establishing treatment goals and assessing therapeutic efficacy (12).

Problem solving has been defined as a process encompassing a range of cognitive and psychological efforts to eliminate obstacles experienced in order to achieve a specific goal (13). We suggest that given the psychological aspects of AS disease, patients with AS might develop problem solving and coping attitudes which may be different than those adopted by healthy individuals. Previously, stress management in AS patients has been rarely investigated (14,15) and to our best knowledge, this is the first study to report on problem solving attitudes of AS patients.

This study aims to determine anxiety, depression, self-esteem, stress management and problem solving skills in AS patients compared to healthy subjects.

## Materials and Methods

The study included 33 ambulatory patients diagnosed with AS by Modified New York Criteria who presented to the physical therapy and rehabilitation outpatient clinic of university medical faculty research and training hospital and 31 age- and gender-matched healthy subjects selected among hospital staff and patient relatives. Individuals with a history of chronic illness such as heart failure, chronic renal failure, chronic liver disease, chronic obstructive pulmonary disease, thyroid problems, neoplastic disease or

chronic infectious disease and those receiving chronic steroid therapy were excluded from both groups. Illiterate persons or individuals who were mentally unable to fully comprehend and complete study questionnaires were also excluded. All patients included were informed about the study, and their written informed consent was obtained. The study protocol was approved by the institutional ethics committee. The study was conducted in accordance with the principles of the Declaration of Helsinki.

### **Measurements**

#### **Socio-demographic Data Form**

The socio-demographic data form used for the study was generated by the authors and administered to all participants at the initial presentation. The data form included various types of information about the participants including age, sex, marital status, occupation, smoking and alcohol use.

#### **Bath Ankylosing Spondylitis Disease Activity Index**

Disease activity and functional status of the patients in the study were evaluated using the Bath Ankylosing Spondylitis Disease Activity Index (BASDAI).

BASDAI consists of 6 questions addressing five major symptoms of the disease over the past week (fatigue, spinal and hip pain, swelling and pain in peripheral joints, enthesitis, duration and severity of morning stiffness). Total score is obtained by rating each question on a 0-10 cm visual analogue scale and individual scores are averaged. BASDAI questionnaires have been validated to Turkey in previous studies (16,17).

#### **Hospital Anxiety and Depression Scale**

The Hospital Anxiety and Depression Scale (HADS) is a self-assessment scale which was originally developed by Zigmond and Snaith (18), used for the evaluation of depression and anxiety and to measure changes in their levels and severity in patients. HADS questionnaires have been validated to Turkey in previous studies by Aydemir et al. (19). The HADS contains a total of 14 questions; seven of them (odd numbers) relate to anxiety and seven relate to depression (even numbers). It is a 4-point Likert scale.

#### **Rosenberg Self-Esteem Scale**

The Rosenberg Self-Esteem Scale (RSES) is a self-report instrument for evaluating global self-worth. It is a 10-item Likert scale that is used to measure

individual self-esteem. RSES questionnaires have been validated to Turkey in previous studies by Çuhadaroğlu (20). Higher scores suggest higher self-esteem.

#### **Problem Solving Inventory**

The Problem Solving Inventory (PSI) is a 35-item instrument which was developed by Heppner and Peterson (21). Overall, the PSI scale assesses an individual's awareness of his or her problem-solving abilities. Higher total scores indicate lower level of self-perceived confidence in problem solving. The Turkish adaptation study of the PSI was performed by Sahin et al. (22).

#### **The Coping Orientation to Problems Experienced Inventory**

This inventory was developed by Carver et al. (23) to determine strategies used by individuals for coping with stressful events. It is a self-report instrument consisting of 60 questions. The Coping Orientation to Problems Experienced (COPE) inventory is comprised of 15 subscales: 1) Active coping, 2) Restraint, 3) Planning, 4) Use of instrumental social support, 5) Suppression of competing activities, 6) Positive reinterpretation and growth, 7) Religious coping, 8) Humor, 9) Use of emotional social support, 10) Acceptance, 11) Behavioral disengagement, 12) Substance use, 13) Denial, 14) Mental disengagement, 15) Focus on and venting of emotions. Total possible score for each subscale ranges from 4 to 16 points. The sum of the points obtained on the first five subscales gives the score for problem-focused coping, the sum of the points from the subscales 6 to 10 gives the score for emotion-focused coping and the sum of the points from the last five subscales gives the score for non-functional coping. The psychometric properties of the COPE were examined in a Turkish sample by Ağargün et al. (12).

#### **Statistical Analysis**

Statistical analyses of the study data were performed using SPSS 16.0 software package. Normal distribution of scores was checked using Kolmogorov-Smirnov and Shapiro-Wilk tests. Relations between test scores were analyzed by Mann-Whitney U and independent t-tests. Correlations between BASDAI scores of patients and other scales were evaluated using Pearson's coefficient of correlation. A p value less than 0.05 was considered statistically significant.

## Results

The study enrolled 33 AS patients and 31 healthy controls. The mean age of patients and controls was  $36.3 \pm 10.9$  and  $33.6 \pm 6.2$  years, respectively with no significant between the two groups ( $p > 0.05$ ). There were 11 (33.3%) females and 22 (66.7%) males in the AS group. Control group consisted of 6 (19.4%) females and 25 (80.6%) males. Gender distribution was not statistically significantly different between the groups ( $p > 0.05$ ). No significant difference was found between AS patients and control group with respect to the marital status, education, occupation, alcohol use and smoking ( $p > 0.05$ ) (Table 1).

On the HADS scale, AS patients showed significantly higher anxiety and depression scores versus control group ( $p < 0.05$ ). Also, AS patients had significantly lower self-esteem as demonstrated by RSES scores ( $p < 0.05$ ). When study groups were compared using the PSI, a significant difference was observed only in the "approach-avoidance style" subscale. AS patients

	Patient group (n=33)	Control group (n=31)	p
<b>Age</b>	$36.3 \pm 10.9$	$33.6 \pm 6.2$	0.22
<b>Gender</b>			
Female	11 (33.3%)	6 (19.4%)	0.20
Male	22 (66.7%)	25 (80.6%)	
<b>Marital status</b>			
Married	23 (69.7%)	24 (77.4%)	0.48
Single or divorced	10 (30.3%)	7 (32.6%)	
<b>Education</b>			
None	1 (3%)	0 (0%)	0.08
Literate	0 (0%)	1 (3.2%)	
Primary school	14 (42.4%)	5 (16.1%)	
High-school graduate	11 (33.3%)	15 (48.4%)	
University graduate	7 (21.2%)	10 (32.3%)	
<b>Occupation</b>			
Unemployed	10 (30.3%)	4 (12.9%)	0.53
Civil servant	6 (18.2%)	14 (45.2%)	
Worker	12 (36.4%)	12 (38.7%)	
Self-employed	3 (9.1%)	0 (0%)	
Other	2 (6.1%)	1 (3.2%)	
<b>Alcohol use</b>			
Yes	4 (12.1%)	3 (9.7%)	0.06
No	29 (87.9%)	28 (90.3%)	
<b>Smoking</b>			
Yes	15 (45.5%)	7 (22.6%)	0.53
No	18 (87.9%)	24 (77.4%)	

**Table 2. Comparison of patient and control groups by the Hospital Anxiety and Depression Scale, the Rosenberg Self-Esteem Scale and the Problem Solving Inventory**

	Patients (n=33)	Controls (n=31)	p
BASDAI	$4.15 \pm 1.21$	-	-
HADS/Anxiety	$9.55 \pm 4.35$	$5.52 \pm 2.55$	0.001*
HADS/Depression	$8.0 \pm 4.39$	$4.65 \pm 3.33$	0.001*
RSES	$18.88 \pm 6.41$	$22.35 \pm 3.89$	0.01*
PSI/Hasty attitude	$30.82 \pm 6.93$	$27.61 \pm 5.84$	0.05
PSI/Thinking attitude	$15.61 \pm 17.89$	$12.65 \pm 4.79$	0.37
PSI/Avoidant attitude	$12.12 \pm 4.94$	$9.45 \pm 4.07$	0.02*
PSI/Evaluative attitude	$7.24 \pm 3.62$	$7.90 \pm 3.14$	0.44
PSI/Self-confident attitude	$16.73 \pm 6.25$	$15.16 \pm 5.89$	0.30
PSI/Planning attitude	$10.30 \pm 3.83$	$9.23 \pm 4.09$	0.28

BASDAI: Bath Ankylosing Spondylitis Disease Activity Index, HADS: Hospital Anxiety and Depression Scale, RSES: Rosenberg Self-Esteem Scale, PSI: Problem Solving Inventory, \* $p < 0.05$

**Table 3. Comparison of patient and control groups using the Coping Orientation to Problems Experienced Scale**

	Patients (n=33)	Controls (n=31)	p
	Mean $\pm$ SD	Mean $\pm$ SD	
<b>Problem-focused coping</b>			
Use of instrumental social support	$13.03 \pm 2.58$	$12.13 \pm 3.03$	0.20
Active coping	$12.18 \pm 2.78$	$12.65 \pm 2.57$	0.49
Restraint	$10.21 \pm 1.86$	$10.65 \pm 2.12$	0.38
Suppression of competing activities	$11.27 \pm 2.30$	$11.48 \pm 2.52$	0.72
Planning	$12.12 \pm 2.48$	$12.39 \pm 2.15$	0.65
<b>Emotion-focused coping</b>			
Positive reinterpretation	$13.27 \pm 2.49$	$13.74 \pm 1.93$	0.40
Religious coping	$14.45 \pm 1.62$	$1.42 \pm 2.57$	0.05
Humor	$7.91 \pm 2.70$	$9.68 \pm 2.97$	0.01*
Use of emotional social support	$11.12 \pm 3.31$	$11.68 \pm 2.66$	0.46
Acceptance	$11.30 \pm 3.6$	$10.32 \pm 2.68$	0.18
<b>Non-functional coping</b>			
Mental disengagement	$9.85 \pm 2.68$	$10.45 \pm 1.89$	0.30
Focus on and venting of emotions	$12.33 \pm 3.06$	$11.32 \pm 3.28$	0.20
Denial	$7.15 \pm 2.90$	$6.77 \pm 2.56$	0.58
Behavioral disengagement	$7.55 \pm 2.64$	$6.55 \pm 2.30$	0.11
Substance use	$5.67 \pm 3.21$	$4.77 \pm 1.66$	0.17

SD: Standard deviation, \* $p < 0.05$

were found to assume an avoidant attitude more frequently compared to control group (Table 2).

When AS patients and control group were compared using the COPE, no significant difference was observed between the groups except in the humor subscale of emotion-focused coping. AS patients were found to employ humor as a stress coping strategy less frequently in comparison to control group ( $p>0.05$ ) (Table 3).

Patients had an average BASDAI score of  $4.15\pm 1.21$ . A correlation analysis was performed to check whether BASDAI scores were correlated with other scales and it showed no correlation with anxiety and depression scores. BASDAI scores were positively correlated with RSES scores and a very strong negative correlation was found between BASDAI scores and total PSI scores. Based on the COPE inventory scores, a negative correlation was found between humor, mental disengagement and behavioral disengagement and BASDAI scores ( $p<0.05$ ) (Table 4).

	<b>r</b>	<b>p</b>
RSES	0.41*	0.016
Overall PSI	-0.80**	0.000
<b>COPE</b>		
Humor	-0.40*	0.018
Mental disengagement	-0.35*	0.045
Behavioral disengagement	-0.35*	0.043

RSES: Rosenberg Self-Esteem Scale, PSI: Problem Solving Inventory, COPE: Coping Orientation to Problems Experienced, \*moderately strong correlation, \*\*very strong correlation

## Discussion

It seems plausible that AS patients may experience disturbances in emotional well-being and problems in social adaptation secondary to psychiatric symptoms in addition to physical symptoms and functional disability caused by the disease itself. Thus, we designed the present study to investigate anxiety, depression, self-esteem, stress management and problem solving skills in individuals with AS, a chronic disease that affects approximately 0.5% of the Turkish population (24).

Anxiety and depression are among the most commonly investigated psychiatric conditions among

AS patients (5-9). Previous studies have consistently shown significantly higher anxiety ve depression scores in AS patients compared to control groups. In one study using the HADS tool, Baysal et al. (8) reported significantly higher anxiety scores among AS patients but no significantly difference in depression scores versus control group. Studies have looked at other parameters such as quality of life (6), disability (5), sexual dysfunction (25), and alexithymia (26) in addition to anxiety and depression and found considerable impairment in these areas. As expected, we observed significantly higher scores for anxiety and depression in AS patients versus healthy control group in our study. Anxiety and depression symptoms may also occur in chronic, painful diseases that are associated with functional disability as well as in several psychiatric disorders and may impair coping skills and adversely affect improvement. Accordingly, despair and depression were identified as potential future targets of treatment to diminish functional limitation in AS patients (27).

In the present study, AS patients showed lower self-esteem scores in comparison to control group. Self-esteem reflects a person's overall subjective emotional evaluation of his or her self-worth, self-confidence or self-acceptance. A person with a high self-esteem has a positive evaluation of himself or herself and is able to recognize his/her strengths (28). We identified only one study that focused on self-esteem level in AS patients (25). Similar to our study, that study found lower self-esteem and significantly higher levels of depression, anxiety and alexithymia in AS patients. While the presence of depression and anxiety may affect self-esteem in AS patients, impairment of daily living activities and functional disability caused by the illness are associated with diminished self-esteem. In turn, low self-esteem further impairs the disability and results in worsening of depression, creating a vicious circle.

To our knowledge, this study is the first to utilize the PSI in AS patients. When we compared AS patients with healthy controls based on PSI scores, we found a difference only in the avoidant attitude which was significantly more frequently used by AS patients. The Approach-Avoidance Style subscale of the PSI assesses whether individuals tend to approach or avoid problems and have doubts about their problem solving skills when they fail to solve a

problem. Ineffective problem solving was reported to trigger stressful life events and cause psychological maladaptation (29). There is strong evidence to suggest that problem solving is associated with better adaptation to stress. Successful problem solvers (those who are self-confident and not afraid to confront problems with lower scores in the PSI) were reported to be significantly healthier than unsuccessful problem solvers (those who are less self-confident with higher scores on the PSI) both psychologically and in relation to the cognitive-emotional-behavioral model which is considered vital to cope with challenges (30). More frequent use of avoidant attitude by AS patients may be related to their low self-esteem and pre-existing depression.

We identified two published studies on the mechanisms to cope with stress in AS patients. Using a different scale, Günther et al. (15) found that AS patients employed self-accusation or resignation as a coping strategy less frequently compared to healthy individuals. There was no change in these coping mechanisms in the course of the illness. In a Turkish study, 40 AS patients and 40 healthy volunteers were compared using the COPE and no significant difference was found between the two groups. The disparity between these two studies may have resulted from methodological differences including non-exclusion of psychiatric disorders and gender-based patient selection. In our study, there were no significant differences between the groups except in the humor subscale of emotion-focused coping. Humor is an emotion-focused coping mechanism and may impair or increase the ability to adapt depending on the stressor itself, the circumstances associated with stress and many other factors. Less frequent use of this kind of coping as observed in AS patients may be explained by the tendency toward depression in these patients (depressive patients are more likely to use humor as a coping strategy) (31).

In a correlation analysis examining the correlation of BASDAI scores with other scales used in our study, no correlation was found with anxiety and depression scores. This finding is in contrast with a number of studies that reported a positive correlation (2,5,6). In a study by Karan et al. (32), a weak correlation was found between BASDAI scores and Beck Depression Inventory scores among 24 patients diagnosed with AS. This may be explained by relatively small sample

size and greater BASDAI scores in that study. A positive correlation was found between self-esteem and disease activity in our study. This interesting finding may be related to mental adaptation. Negative correlations were found between disease activity and humor, mental disengagement and behavioral disengagement subscales when correlations were sought between disease activity and stress coping scales. However, in a study by Sarısoy et al. (14), disease activity was not correlated with coping attitudes. It seems that AS patients employ mental and behavioral disengagement strategies less frequently as their disease activity increases. Again, this may be explained by a compensatory or defense mechanism as in the case mentioned above where increased disease activity was associated with higher self-esteem. A similar finding was observed in the correlation analysis for the PSI where scores were improved with higher disease activity. Further studies on larger patient groups are needed to investigate this kind of surprising impact of higher disease activity.

Major limitation of our study was the small sample size. Studies involving classification of the disease activity (e.g. mild, moderate, severe) of AS patients may provide more detailed data. Another limitation was the failure to conduct a detailed psychiatric interview addressing other conditions that might affect mental health in addition to the anxiety and depression scales that we used in the study.

## Conclusion

In conclusion, being a chronic rheumatic disease, AS not only limits daily living activities due to its physical manifestations but also causes psychological problems such as depression and anxiety. However, it does not seem to impair problem solving skills and the ability to cope with stress significantly. It might be helpful to evaluate AS patients using a holistic approach and to be aware of the factors that are associated with difficulties in their social interactions.

## Ethics

**Ethics Committee Approval:** The study protocol was approved by the institutional Ethics Committee.

**Informed Consent:** All patients included were informed about the study.

**Peer-review:** Externally peer-reviewed.

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