



## Evaluation of anxiety levels in patients with chronic orthopedic diseases

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**Objective:** The aim of this study was to evaluate the variables that affect anxiety levels in patients with chronic orthopedic diseases and develop motivational methods to manage these problems.

**Methods:** The study included a total of 100 patients (55 males, 45 females; mean age: 46.8 years; range: 18 to 83 years) that either underwent surgical procedures due to orthopedic diseases lasting for a minimum of one year and not responsive to conservative treatment methods, or were hospitalized due to the complications arising after orthopedic surgical procedures. Psychological evaluation was made using the State-Trait Anxiety Inventory (STAI) forms TX 1 and 2. Data were analyzed using the SPSS 11.0 and evaluated with the ANOVA, Tukey, Student's t and post hoc tests. A value of  $p \leq 0.05$  was considered significant.

**Results:** Mean state anxiety and trait anxiety scores were 43.08 and 42.61, respectively. Depression was diagnosed in 24 of patients and anxiety disorder in 29. Changes in the treatment modality were necessary in 4 patients.

**Conclusion:** Mental and behavioral disorders are rather common in patients with chronic orthopedic diseases. Treatment modalities used for such patients should be established in a bio-psycho-social manner with regards to the psychological and social aspects of the disease.

**Key words:** Anxiety level; bio-psycho-social treatment; chronic orthopedic disease.

Based on the statistics of the study site, the number of patients who are treated for chronic orthopedic diseases have increased over the years. As indicated in the literature, these patients become predisposed to psychosomatic mental and/or behavioral disorders as a result of the long-term effects of their diseases.<sup>[1,2]</sup> They are unable to fulfill their roles they previously undertook as a member of society due to chronic orthopedic disease and physical disabilities. Therefore, the treatment of patients who suffer from psychosocial complications in addition to orthopedic diseases also includes technical, economic and psychosocial difficulties.<sup>[3-5]</sup>

While the technical and economic aspects of treatment methods depend on treatment systems, the psychosocial aspects mainly depend on the patient. In conventional treatment approaches, the psychosocial problems of the patient are not sufficiently taken into consideration. As a consequence, even perfectly applied treatment methods may fail. Although psychosomatic disorders resulting from chronic medical diseases have been studied in the literature, similar problems resulting from chronic orthopedic diseases have not been adequately addressed.

The aim of this study was to address overlooked psychosocial parameters arising in conjunction with

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chronic orthopedic diseases that might adversely affect orthopedic treatments.<sup>[6-8]</sup>

## Patients and methods

This study included 100 consecutive patients (55 male, 45 female; mean age: 46.8 years; range: 18 to 83 years) with orthopedic diseases lasting for a minimum of one year and not responding to conservative treatment or those hospitalized for a new surgical intervention following development of post-surgical complications. Patients older than 85 and younger than 18, and those hospitalized in emergency services due to trauma were not included in the study. Ethical committee approval was received and the patients were informed and verbal consent was given before the study.

The study was conducted as a descriptive study individually and in the form of participant interviews in two separate parts. In the first part, socio-demographic characteristics were examined by questions on age, sex, marital status, occupational education, etc. In the second part, a survey was conducted addressing factors, such as relationships with healthcare personnel, physical disabilities, leisure time activities and lying position, etc. (Table 1). Finally, patients' mental conditions were examined using the State-Trait Anxiety Inventory (STAI) forms TX 1 and 2.<sup>[9]</sup> The STAI is divided into two scales: the state anxiety (SAS) and trait anxiety (TAS). In this test, high scores indicate an increased anxiety level while a score of 60 or higher indicates pathological anxiety.

Statistical analysis was performed using the SPSS 11.0 software. Average values and standard deviations were evaluated using the ANOVA method and Tukey's, Student's t and post hoc tests. Statistical significance level was set at  $p \leq 0.05$ .

## Results

Mean SAS and TAS scores were 43.1 (range: 39.7 to 45.6) and 42.6 (range: 39.7 to 45.6), respectively. SAS and TAS scores were significantly higher in female patients ( $p=0.029$ ) and patients hospitalized for longer periods had lower SAS scores (Tables 1 and 2). Anxiety was observed in 23 cases, depression in 19, anger in 21 and paranoid ideation in 14, with 38 patients in total demonstrating one or more reaction. Based on these results, 28 patients were provided preoperative psychological support. Three patients continued treatment for an average of 7 months after completion of orthopedic treatment.

The educational background of 22% of participants was at an elementary school level. Average SAS scores

of these patients was significantly higher than those with a higher level of education ( $p=0.039$ ) (Table 3). No significant difference was detected in SAS and TAS scores between planned hospitalizations and hospitalizations due to surgical complications. The SAS and TAS scores of patients treated previously at other sites were higher compared with those who were re-hospitalized at the same site due to post-surgical complications (Table 1).

Thirty-six percent of patients stated that they had problems with the hospital staff. Reactions such as anxiety and depression were more prevalent among these patients. SAS and TAS values were higher in patients who underwent more surgeries. Five percent of patients stated that the physical environmental conditions restricted their physical activities. The mean anxiety scores of these patients were significantly higher ( $p=0.002$ ) (Tables 1 and 3).

Forty-eight percent of patients stated that they did not participate in any leisure activities in their spare time. The SAS and TAS values of patients who were occupied with hobbies and handcrafts were higher. Limitation of physical movements constituted a great source of concern in these patients. No significant differences were observed between the SAS and TAS values of the patients occupied with activities such as resting and conversing ( $p>0.05$ ) (Table 1).

## Discussion

Evaluation and treatment activities performed within the scope of orthopedics and traumatology often cross the boundaries of orthopedics and spread to other professional areas. Disregarding this fact leads to failure of the treatments applied. Negative mental reactions developing in chronic orthopedic patients may adversely affect the physiology and social relations of the individual. As a consequence, psychological reactions such as mental adjustment disorder, anxiety and depression may arise. In our opinion, taking these points into consideration while planning the treatment allows for better determination of a suitable treatment method not for the disease but the patient.<sup>[10-13]</sup>

Long-term physical incompetence in chronic orthopedic patients causes disruptions in lifestyle and social roles and the recovery process is suppressed under such conditions.<sup>[14]</sup> Therefore, addressing the mental and social sources of stress is essential for treatment success. This treatment approach is called the bio-psycho-social treatment model.<sup>[15]</sup> Proper psychological support, early cooperation and timely intervention increase the effectiveness of medical treatment. Measuring anxiety levels and determining causative variables allow for the devel-

**Table 1.** Patients' socio-demographic characteristics, hospitalization status, relationship with the hospital staff and other characteristics.

Variable	n	%	STAI-1 score		STAI-2 score		
			Mean	SD	Mean	SD	
Age	18-20	7	7	43.42	5.96	39.85	8.35
	21-23	19	19	41.47	5.50	43.00	6.07
	24-35	11	11	44.27	7.45	44.90	4.54
	36-45	16	16	42.93	7.79	42.50	7.33
	46-55	12	12	45.41	5.36	39.41	5.35
	56-65	21	21	43.61	7.10	43.61	5.66
	66-74	8	8	41.87	8.93	43.50	8.31
75-85	6	6	41.00	5.86	42.33	5.46	
Sex	Female	45	45	44.68	6.52	43.77	5.99
	Male	55	55	41.76	6.62	41.98	6.55
Educational background	Elementary school	22	22	45.59	6.92	42.27	6.43
	Junior high	19	19	39.68	5.87	39.31	6.93
	High school	42	42	43.30	6.50	43.75	5.18
	College	15	15	42.73	7.10	45.20	7.15
	University	2	2	41.50	3.53	38.00	2.82
Working status	Employed	22	22	41.45	6.71	41.86	6.62
	Student	5	5	43.20	5.16	41.20	6.22
	Housewife	31	31	44.96	7.27	43.04	7.05
	Retired	25	25	42.72	6.76	43.25	5.77
	Unemployed	17	17	41.58	6.03	42.70	6.30
Marital status	Married	61	61	43.42	7.04	42.91	6.41
	Single	31	31	42.64	6.17	42.19	5.87
	Widow/Widower	8	8	42.12	6.70	41.87	7.82
Hospitalization	Post-complication	37	37	42.56	6.63	42.35	5.90
	Planned hospitalization	63	63	43.38	6.78	42.76	6.59
Hospitalization period	1-10 days	41	41	43.92	5.70	43.62	6.32
	10-20 days	35	35	42.80	7.04	43.51	6.20
	>20 days	24	24	42.04	7.83	40.75	6.34
Previous hospitalization	Yes	69	69	43.75	6.58	43.01	6.47
	No	31	31	41.58	6.85	41.70	5.95
Regular visitor	Yes	99	99	43.07	6.74	42.71	6.25
	No	1	1	45.00	-	42.00	-
Problems with the physician	Yes	21	21	43.09	6.64	42.61	4.40
	No	79	79	42.34	6.74	42.60	6.75
Problems with the nurse	Yes	30	30	44.16	6.29	44.50	5.27
	No	70	70	42.61	6.87	41.80	6.58
Problems with the caregivers	Yes	26	26	43.85	7.02	43.19	5.89
	No	74	74	43.13	6.67	42.45	6.45

opment of appropriate psychological support and treatment alternatives. The treatment model selected for some patients who participated in our study was revised or completely changed after the evaluation of the patient's psycho-social state.

Long-term physical disability, fear of living dependent upon others and adverse conditions such as loss of time and money, as well as treatment expenses,

cause depression, anxiety or a combination of these.<sup>[16]</sup>

In our study, depression was observed in 19 cases, anxiety in 21, anger-hostility in 21, and paranoid ideation in 14. In this subgroup of patients, resistance against treatment occurred. Treatment methods applied before this is understood may result in failure. This has most strikingly been observed in external fixator treatment.<sup>[16,17]</sup> In some of our cases, external fixation treat-

**Table 2.** Anxiety state scores of patients according to sex and physical disabilities.

		n	Mean anxiety state score	Index value	t	p
Sex	Female	45	446.889	98	2.111	0.029
	Male	55	417.636	98		
Difficulty in physical activities	Yes	96	427.396	98	2.553	0.012
	No	4	512.500	98		

**Table 3.** Relation between patients' educational background and hospital conditions with anxiety level.

		Mean STAI-1 score	SD	f	p
Level of education	Low	45.59	5.90	2.171	0.039
	High	39.68			
Suitability of the environment's physical conditions with the patient's state	Satisfied	44.04	0.88	0.157	0.002
	Not satisfied	43.16			

ment was terminated earlier than planned. Planned treatment was changed due to the patients' mental condition in 4% of cases. Merkens also emphasized that patients' psycho-social adjustments are insufficiently considered in treatment planning.<sup>[18]</sup> Many patients experience problems with treatment staff and an environment lacking mutual trust occurs. Therefore, in our opinion, treatment should be patient-centered rather than disease-centered.<sup>[19,20]</sup> Furthermore, it is important to shorten the duration of stay or isolate patients suffering from psychological adverse reactions in order to maintain motivation of other patients.

A major source of stress, such as surgery, may trigger the development of different psychiatric disorders in predisposed patients. In our study, treatment was terminated before completion in 2 patients receiving circular fixator treatment and delirium occurred in one patient receiving total knee endoprosthesis. Therefore, continued psychological observations may be of benefit for patients undergoing postoperative treatment.

A positive correlation was detected between the level of education and the stress developed. In patients with higher level of education, SAS values were high in the beginning of the hospitalization period. Such patients were able to develop effective skills for coping with stress. In such patients, information and proper psychological support lower SAS values. It has been suggested in the literature that there is a significant relationship between the number of hospitalizations and SAS values.<sup>[21]</sup>

In conclusion, we believe that treatment approaches that do not take the psychological states and social

environments of patients into consideration reduce efficacy. Thus, the bio-psycho-social treatment models allow for correct understanding of patients' expectations and knowledge about their treatment and thereby increase the rate of success in treatment.

**Conflicts of Interest:** No conflicts declared.

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