

## Cardiovascular nursing research / Kardiyovasküler hemşirelik araştırması

## Evaluation of anxiety and depression levels in patients with myocardial infarction

## Miyokart enfarktüsülü hastalarda anksiyete ve depresyonun incelenmesi

Zeynep Canlı Ozer,<sup>1</sup> Fisun Senuzun,<sup>2</sup> Yasemin Tokem<sup>3</sup><sup>1</sup>Akdeniz University, Antalya School of Health, Antalya; <sup>2</sup>Ege University, Izmir Ataturk School of Health, Izmir;<sup>3</sup>Ege University, Higher School of Nursing, Izmir

**Objectives:** Patients with myocardial infarction (MI) may experience anxiety and depression. This study was designed to determine anxiety and depression levels in patients with MI.

**Study design:** The study included 506 patients (199 women, 307 men; mean age 55.7±6.9 years) who were admitted to the cardiology department for MI. Data were collected using a questionnaire to identify patient characteristics and the Hospital Anxiety and Depression Scale (HADS). The HADS has been validated as a sensitive screening tool for anxiety and depression in MI patients in the Turkish population.

**Results:** Clinically severe anxiety was found in all the patients (100%). Depression scores showed a clinically normal level in 45 patients (8.9%), borderline level in 289 patients (57.1%), and severe level in 172 patients (34%). The mean HADS score was 11.4±2.9, being 12.2±4.1 and 10.6±4.1 for anxiety and depression, respectively. Among patient characteristics, age was significantly associated with both anxiety and depression subscales (p<0.001), and education level (p<0.05), total family income (p<0.01), health insurance (p<0.05), and the number of myocardial infarctions (p<0.05) were significantly associated with the depression subscale. In regression analysis, age (β=-0.128), education level (β=0.082), and working status (β=-0.79) independently affected both anxiety and depression, and total family income (β=-0.128) and health insurance (β=-0.086) significantly affected depression.

**Conclusion:** Our data suggest that planning nursing interventions to decrease anxiety and depression levels and implementation of cardiac rehabilitation programs are of particular importance in patients with MI.

**Key words:** Anxiety; depression; myocardial infarction/psychology; psychiatric status rating scales; questionnaires.

**Amaç:** Miyokard enfarktüsü (ME) geçiren bireylerde anksiyete ve depresyon gelişebilir. Bu çalışmada ME geçiren bireylerde anksiyete ve depresyon düzeyleri araştırıldı.

**Çalışma planı:** Araştırma, Kardiyoloji ünitelerine yatan 506 hasta (199 kadın, 307 erkek; ort. yaş 55.7±6.9) ile yapıldı. Veriler, araştırmacı tarafından hazırlanan ve hastaların tanıtıcı özelliklerini içeren kişisel bilgi formu ve Hastane Anksiyete ve Depresyon Ölçeği (HADÖ) ile toplandı. Ölçeğin ülkemizdeki ME'li hastalarda geçerliliği araştırılmış ve anksiyete ve depresyon için yararlı ve duyarlı bir tarama aracı olduğu gösterilmiştir.

**Bulgular:** Tüm hastalarda (%100) klinik olarak ciddi düzeyde anksiyete görüldü. Depresyon açısından, 45 hasta (%8.9) klinik olarak normal bulunurken, 289 hastada (%57.1) sınırda, 172 hastada ise (%34) ciddi düzeyde depresyon belirlendi. HAD ölçeğinin puan ortalaması 11.4±2.9; anksiyete ve depresyon puan ortalamaları ise sırasıyla 12.2±4.1 ve 10.6±4.1 idi. Demografik veriler içinde yaş ölçeğinin anksiyete ve depresyon altboyutu ile (p<0.001), eğitim durumu (p<0.05), ailenin toplam gelir durumu (p<0.01), sağlık güvencesi (p<0.05) ve ME geçirme sayısı (p<0.05) depresyon altboyutu ile anlamlı ilişki gösterdi. Regresyon analizinde, yaş (β=-0.128), eğitim (β=0.082), çalışma durumu (β=-0.79) anksiyete ve depresyonu, ailenin toplam geliri (β=-0.128) ve sağlık güvencesi (β=-0.086) depresyonu anlamlı derecede etkileyen bağımsız değişkenler idi.

**Sonuç:** Bulgularımız, ME geçiren bireylerde anksiyete ve depresyon düzeylerinin zaltılmasına yönelik hemşirelik girişimlerinin planlanması ve kardiyak rehabilitasyon programlarının uygulanmasının önemini ortaya koymaktadır.

**Anahtar sözcükler:** Anksiyete; depresyon; miyokart enfarktüsü/ psikoloji; psikiyatrik durum değerlendirme ölçeği; anket.

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Corresponding address: Doç. Dr. Zeynep Canlı Özer. Akdeniz Üniversitesi, Antalya Sağlık Yüksekokulu, 07058 Antalya.

Tel: +90 - 242 - 227 94 63, e-mail: zeynepardaozer@yahoo.com

Coronary artery diseases (CAD), are among the most commonly encountered chronic diseases in Turkey (1990-2005 incidence rate of 5-6%).<sup>[5]</sup> Changes in the health status of patients with myocardial infarction (MI) may be paralleled to an increase in anxiety and depression levels.<sup>[2-5]</sup> These patients, together with their personality features are affected by factors such as depression, anxiety, stress, the need for disease-related information, a need to contain the disease and the need for social support. Medical treatment, personal care, limitation to physical activity, and an increase in disease-related expenditure following MI may lead to the development of anxiety and depression in these patients. Anxiety is an emotional response to any threat or danger. As a result, anxiety is an expected reaction in individuals who experience MI. Anxiety may be observed during the early stages of MI, since as an individual is faced with the feeling of apprehension and fear against this threatening danger.<sup>[6,7]</sup> Individuals with such affective processes find it difficult using effective coping mechanisms previously implemented to solve problems. The volume of heart beat, cardiac output, and the blood pressure turn to increase in individuals with normal cardiac functions due to the effects of stress and anxiety. However, the heart of patients who experience MI is incapable of withstanding the load brought about by stress.<sup>[6-8]</sup>

MI is contained by treatment, care and disease-related education. Nurses, who form a part of the medical team, help to increase patient adaptation to the disease, decrease anxiety and increase the quality of life of patients through their role in arranging MI-related training programs on issues such as appropriate nutrition, regular exercises, regular use of medication, quitting of smoking, and weight loss.<sup>[9,10]</sup>

Patients who experience MI have been reported to have a high rate of re-hospitalization, with 50% of the patients re-hospitalized with 3-5 years, whereas 19% are re-hospitalized within the first six months.<sup>[11]</sup> Reduction of the patient's anxiety is mostly the role of the nurse, who is responsible for attending to the patient's family, environment, and to a great extent the patient's treatment and care. It is important to facilitate the patient's adaptation to life, understand the discomfort and stressful factors from the symptoms, in order to reduce anxiety through the nurse's integrated views.

Psychological stressful factors, especially depression generally form the background of cardiovascular diseases. Sympathetic hyperactivity and coronary vasospasm stimulated by abnormally intense stress have been reported to be a possible cause of acute MI.<sup>[12]</sup> The concomitant existence of major depression in patients

with depression cardiovascular diseases is beyond coincidence due to the interaction of both conditions. Depression has been reported to be an independent risk factor in post-acute MI mortality.<sup>[13]</sup>

There is not enough data in Turkey about the incidence of anxiety and depression in patients with MI, and the relationship of these conditions with demographic variables. The aim of this study was to investigate the incidence of anxiety and depression in patients with MI, and sociodemographic variables affecting anxiety and depression in these individuals.

## PATIENTS AND METHODS

This study consists of MI patients who were hospitalized in the university hospitals involved in the study in the year 2003. All 850 patients who were admitted with the diagnosis of MI formed the study population. Inclusion criteria were being diagnosed with MI, age above 18 years, and the ability of communicate effectively with health care professionals. Patients with psychotic diseases or those with cognitive disorders were excluded from the study. A total of 550 patients who fulfilled the inclusion criteria formed the study sample. Face-to-face discussions were carried out with the patients during the course of the study. The study evaluation was performed with 506 patients (199 women, 307 men; mean age  $55.7 \pm 6.9$  years) since 8% ( $n=44$ ) of the patients failed to complete the data collection forms, refused to participate in the study or lived very far away.

Permission was obtained from the Nursing Services Directorate and office of the chief physician, in order to carry out the study. All patients who were to participate in the study were briefed about the study and both verbal and written informed consents were obtained.

Data collection and psychometric scales. The study data were collected using a questionnaire prepared by the authors from results of literature searches and the Hospital Anxiety and Depression Scale (HADS). The duration of responding to data collection tools was 10-15 minutes.

The question form consisted of 30 items, meant to identify patient characteristics.<sup>[11-11]</sup> The HADS is a self-evaluation scale especially designed for use in the hospital environment and which identifies the risk of anxiety and depression in patients, and measures changes in the level and intensity. The scale has been shown to provide clinically significant results for psychological analysis in various studies with clinical group comparisons. The scale is made up of 14 items consisting of HADS-A (Anxiety, 7 questions) and

HADS-D (Depression, 7 questions) subscales. The 4-grade Likert scale was used for every item and the higher score obtained for every subscale was 21. Scores of 0-7 were evaluated for every subscale as "normal", 8-10 as "borderline", 11 and above as an indication for significant morbidity.<sup>[14-17]</sup> The HADS has been validated as a useful and sensitive screening tool for anxiety and depression in MI patients in the Turkish population.<sup>[18]</sup> The HADS was translated into Turkish by Aydemir et al.<sup>[18]</sup>, satisfied validity and reliability studies and was reported as a suitable tool for the Turkish population. The reliability coefficient of the anxiety and depression HADS subscales for the Turkish patient group was 0.85 and 0.78, respectively.<sup>[18]</sup>

Statistical analyses were performed using the SPSS version 10.0 software program. Anxiety and depression data were assessed by descriptive analysis (mean±standard deviation). The students t-test and univariate analysis were used for the comparison of anxiety and depression scores associated with every demographic variable. The relationship of demographic variables with anxiety and depression scores was investigated using the Spearman correlation analysis. The assumptions of regression analysis were evaluated using independent variables and the demographic and clinical characteristics of the patients. A  $p < 0.05$  value was considered as statistically significant.

## RESULTS

Sociodemographic characteristics of patients enrolled in the study are shown in Table 1. The mean age of the patient group was  $55.7 \pm 6.9$ ; 60.7% of the patients were men, 36.6% were secondary school graduates, 79.8% were unemployed, while 91.1% were made up of couple who were married or living together. 62.1% of the patients were found to have experienced their first MI, while 98.4% had social insurance.

Distribution of the anxiety and depression scores of the patient group is shown in Table 2. All participants (100%) were found to suffer from clinically severe anxiety. From the depression point of view 45 patients (8.9%) were found to be clinically normal, 289 patients (57.1%) were borderline, whereas 172 patients (34%) were found to suffer from severe depression. The mean HADS score was  $11.4 \pm 2.9$ ; whereas the anxiety and depression scores were  $12.2 \pm 4.1$  and  $10.6 \pm 4.1$ , respectively.

Age was found to have a weak relationship with HADS and HADS-A subscale ( $r = 0.144$ ,  $p < 0.001$ ; and  $r = 0.155$ ,  $p < 0.001$ , respectively), whereas the level of education ( $r = 0.108$ ;  $p < 0.05$ ), total family income ( $r = 0.154$ ;  $p < 0.01$ ), health insurance ( $r = 0.101$ ,  $p < 0.05$ )

**Table 1. Sociodemographic and clinical characteristics of the patients**

	Number	Percentage
Gender		
Female	199	39.3
Male	307	60.7
Level of education		
Literate	17	3.4
≤5 years	147	29.1
8 years	185	36.6
11 years	84	16.6
University	73	14.4
Working status		
Full time	82	16.2
Part time	20	4.0
Non-employed/retired	404	79.8
Marital status		
Married/living together	461	91.1
Living alone	45	8.9
Total family income (USD)		
200	286	56.5
201-350	175	34.6
351 and above	45	8.9
Presence of health insurance	498	98.4
Frequency of MI episodes		
Once	314	62.1
Twice	137	27.1
Thrice	55	10.9

and the number of MI experienced ( $r = 0.093$ ;  $p < 0.05$ ) were found to have a weak relationship with the HADS-D subscale (Table 3).

Evaluation of the anxiety and depression mean scores with regards to demographic data (Table 4) demonstrated that the anxiety scores of patients ≤50 years old ( $p = 0.03$ ) was significantly higher than of the other age group. The anxiety-depression score ( $p = 0.04$ ) and the depression score ( $p < 0.01$ ) of the unemployed/retired patients was significantly higher. On the other hand, the depression score of married couples was significantly higher than that of patients living alone ( $p = 0.04$ ), significantly higher in patients with total family income of 201-350 \$ ( $p = 0.02$ ) compared to the other income group, and also found to be significantly higher in patients with health insurance ( $p < 0.05$ ) than in those without.

**Table 2. Distribution of patient anxiety and depression scores**

Scores	HADS-A		HADS-D	
	Number	Percentage	Number	Percentage
Between 0-7	0	-	45	8.9
Between 7-10	0	-	289	57.1
11 and above	506	100.0	172	34.0
Total	506	100.0	506	100.0

HADS: Hospital Anxiety and depression Scale; A: Anxiety subscale; D: Depression subscale

**Table 3. Relationship of demographic variables with anxiety and depression scores (Spearman correlation analysis).**

	HADS		HADS-A		HADS-D	
	r	p	r	p	r	p
Age	0.144	0.001	0.155	0.000	0.018	0.691
Gender	0.027	0.55	0.037	0.409	0.004	0.922
Level of education	0.066	0.136	0.024	0.587	0.108	0.015
Working status	0.072	0.107	0.016	0.724	0.058	0.195
Marital status	0.013	0.770	0.052	0.242	0.076	0.089
Total family income	0.075	0.093	0.028	0.532	0.154	0.001
Health insurance	0.069	0.121	0.037	0.402	0.101	0.022
Frequency of MI episodes	0.010	0.823	0.044	0.323	0.093	0.037

HADS: Hospital Anxiety and depression Scale; A: Anxiety subscale; D: Depression subscale; MI: Myocardial infarction

The anxiety and depression scores and the demographic data of the regression analysis are shown in Table 5. Age (HADS:  $\beta=-0.128$ ; HADS-A:  $\beta=-0.159$ ), level of education (HADS:  $\beta=0.082$ ; HADS-D:  $\beta=-0.098$ ), working status (HADS-D:  $\beta=-0.79$ ), total family income (HADS-D:  $\beta=-0.128$ ), and health insurance (HADS-D:  $\beta=-0.086$ ) were shown to significantly independently affect anxiety and depression scores.

## DISCUSSION

In this study, the anxiety and depression levels of MI patients and their sociodemographic data affecting these

factors were investigated. All patients enrolled in the study (100%) were found to have findings of anxiety (severe anxiety), whereas 34% had severe depression. This study demonstrates that the HADS was adequate in the determination of anxiety and depression in patients with MI. High levels of anxiety scores in patients with MI was thought to be associated with previous negative experiences with the disease, the feeling that the general health status would deteriorate, and the fear of death.<sup>[19,20]</sup> Ruo et al.<sup>[21]</sup> reported that MI patients demonstrated reactions such as fear, worry, depression, denial, and misconception, when faced with symptoms from their previous experiences such as

**Table 4. Comparison of the anxiety and depression scores according to demographic data**

		HADS		HADS-A		HADS-D	
		Mean±SD	p	Mean±SD	p	Mean±SD	p
Age	≤50	11.5±2.7	0.12	13.1±4.2	<b>0.03</b>	10.7±3.8	<b>&lt;0.05</b>
	50-59	11.5±3.0		12.2±4.1		10.8±4.5	
	≥60	10.9±2.7		11.5±3.9		10.4±3.8	
Gender	Female	11.4±3.1	0.93	12.0±4.1	0.42	10.8±4.4	0.48
	Male	11.4±2.7		12.3±4.1		10.5±3.9	
Level of education	Literate	10.8±2.5		12.5±3.4		9.1±3.4	
	≤5 years	11.5±2.9	0.06	12.4±4.4	0.07	10.6±4.3	0.61
	8 years	11.0±2.7		11.8±4.1		10.2±4.1	
	11 years	11.9±2.9		12.5±3.8		11.2±3.8	
Workings status	University	12.0±2.8		12.5±4.1		11.4±4.1	
	Fulltime	11.2±2.4		12.2±4.1		10.2±3.4	
	Part time	10.0±0.2		11.7±4.2		8.3±1.9	
	Unemployed/ Retired	11.5±2.9	<b>0.04</b>	12.3±4.1	0.85	10.8±4.3	<b>&lt;0.01</b>
Marital status	Married/Living together	11.4±2.9	0.54	12.1±4.1	0.24	10.8±4.1	<b>0.04</b>
	Living alone	11.2±2.5		12.9±4.4		9.4±3.2	
Total family income	200\$	11.2±2.8		12.3±4.6		10.1±3.8	
	201-350\$	11.7±2.9	0.14	12.0±4.0	0.78	11.4±4.3	<b>0.02</b>
	Above 351\$	11.6±2.8		12.1±4.4		4.1±3.9	
Health insurance	Present	11.4±2.9	0.97	12.2±4.1	0.69	10.7±4.1	<b>&lt;0.05</b>
	Absent	9.8±3.2		11.6±5.8		7.9±2.8	
Frequency of MI episodes	Once	11.4±2.9	0.96	12.0±4.0	0.39	10.9±3.9	0.31
	Twice	11.4±3.0		12.6±4.2		10.3±4.5	
	Thrice	11.3±2.6		12.4±4.6		10.3±3.7	

HADS: Hospital Anxiety and depression Scale; A: Anxiety subscale; D: Depression subscale; MI: Myocardial infarction

**Table 5. Regression analysis of the effect of demographic variables on anxiety and depression**

	HADS $\beta$	HADS-A $\beta$	HADS-D $\beta$
Age	-0.128*	-0.159**	-0.024
Gender	-0.004	-0.030	-0.035
Level of education	0.082*	0.020	-0.098*
Working status	0.062	0.010	-0.79*
Marital status	0.027	-0.050	0.090*
Total family income	0.073	-0.023	-0.128*
Health insurance	-0.074	-0.020	-0.086*
Frequency of MI episodes	-0.009	0.046	0.0060

\* $p < 0.05$ ; \*\* $p < 0.01$ ; HADS: Hospital Anxiety and depression Scale; A: Anxiety subscale; D: Depression subscale; MI: Myocardial infarction

pain, fear and nausea, and that the stress which these patients experienced was due to a significant and life threatening event.

In this study, younger patients were reported to experience more psychological stress than their elder counterparts. Patients who were  $\leq 50$  years old may have been experiencing more anxiety/depression probably due to their tedious working life and the feeling of family responsibility, when faced with severe threatening events. The active role played by young patients in the working environment and their various responsibilities in life is suggested to be the most important causative factor for the psychological stress experienced by this group of patients.

No difference was observed in our study in the anxiety and depression scores with regards to age. On the other hand, evaluation of anxiety and depression subscales demonstrated that anxiety scores were higher in males, whereas depression scores were higher in females. This difference between the two genders may have been mostly due to the difference in the effect of life on men and women. The most important worries observed in men during the disease and recovery periods was worrying about returning to work and their sex life, whereas in addition to these women were more worried about not going to fulfill their role and responsibilities in the family and taking care of their children. The fact that women are forced to make changes in their lives and the difficulties experienced by women in maintaining their traditional roles in their marriages and family are important factors affecting depression and anxiety. The higher level of depression scores of patients in this study and the need to obtain physical and emotional support makes them think that they may be separated from their partner and children.

The high anxiety and depression scores of the unemployed and retired patients is associated with their worry of not knowing how to satisfy their financial requirement and possible increases in economic burden. Petrie et al.<sup>[22]</sup> reported that patients who experienced MI

were said to be worried about distancing themselves from their social environment knowing they were not going to work, worried about losing their abilities and about possible economic difficulties, all due to physical incapacity and psychological imbalance inconsistency. Economic difficulties make adaptation to and management of the disease difficult in patients with low income.

Investigation for anxiety and depression is very important for various reasons, during the course of hospitalization in patients with MI. depression may also have an effect on the quality of life and physical limitations in patients with coronary artery disease, rather than on cardiac functions per se.<sup>[23]</sup> For example, this psychological condition may lead to the administration of intensive antiplatelet treatment and an increase in platelet activation in patients with post-MI depression, and may decrease response to the recommended treatment. Although these strategies have not been investigated, it is important to appropriately define hospitalized MI patients with depression in order to decide on discussing the issue. Some authors advocate the fact that depression should be determined while the patient is in the hospital since morbidity and mortality risks are higher in patients with depression following MI.<sup>[23-26]</sup> Health care workers play a very important role in the development of interventions towards the determination of anxiety and depression in patients with MI found in coronary care environments. Patients should be evaluated using appropriate scales and well established clinical discussions. These evaluations may be extended to a few weeks following the patient's discharge from the hospital.<sup>[26,27]</sup>

Health care professionals should help patients to realize their fears and worries, and should help patients in the decision-making process concerning their treatment. On the other hand it also important to investigate how the patient's family and friends can participate in supporting the patient and strengthening social interaction. Educating the partner, family members and friends about depression may help them understand results of the disease and to development management strategies, thereby decreasing the risk of isolation. Reports show that patients who perceive the emotional support given by family members and friends present better results in the presence of major depression.<sup>[26]</sup> Paralleled with other studies,<sup>[23-27]</sup> our study also demonstrated that depression and anxiety both increased mortality in cases of MI. The development of anxiety and depression associated with MI should be investigated, followed by necessary nursing interventions to determine how patients would use stress-specific coping resources.

Anxiety and depression are the most widely known psychological problems experienced and perceived by

patients suffering from various acute and chronic diseases. Anxiety and depression are also observed both during the acute stage and during the recovery period in patients with MI. Health care professionals should play an important role in the identification, direction and the treatment of psychological problems of patients with MI due to its negative effect on disease management and the adaptation of patients to the disease process.

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