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Relationship Between Problem Solving Skill and Psychiatric Symptoms in Patients who have Undergone Myocardial Infarction

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Introduction

Myocardial Infarction is an acute and deadly disease and is defined as irreversible heart muscle necrosis that occurs as a result of prolonged ischemia [1]. Patients undergo high levels of depression, anxiety, insecurity and indecision following myocardial infarction, they experience guilt with regard to the disease and they may also feel their health or life goals to be under threat or to lose them all completely [2].

Medical treatment, self-care, limitations in physical activity, increase in financial expenses due to the disease following myocardial infarction may cause patients to undergo anxiety and depression and these patients might experience difficulties in using the effective coping mechanisms that they previously used to solve their problems [3]. It is stated that mental or behavioral problems accompanying physical diseases have negative effects on patient compliance, quality of life, treatment duration and expenses, improvement and well-being, course of the disease, mortality and morbidity [4,5]. Chronic disease cause significant changes to be made in the lives of both the patient and his/her family, professional environment is affected as a result of losses due to chronic diseases, patients can lose their jobs, they can experience sexual, physical, psychological and social limitations due to the disease, treatment methods and the medications used and these can cause many psychological effects to occur such as denial, anxiety, depression and rage [6]. Life is full of daily problems and stressful events for most people and these difficulties have negative effects on the physical and mental health of the individual. One of the most important personal sources in overcoming these difficulties is the problem solving skill of the individual and ineffective problem solving causes negative results thus leading to mental adaptation problems [7]. Problem solving is defined as the goal-oriented, behavioral, cognitive and emotional reactions that the individuals show in order to adapt and meet the demands in their daily lives arising from internal and external changes [8]. It is stated that Coronary Artery Diseases (CAD) limit the physical, emotional and social functions of the individual thus preventing him/her from experiencing satisfaction from life and decreasing the quality of life in general [9]. Low self-esteem that develops as a result of MI along with the fact that the individual constantly perceives himself/herself in the role of a "patient" decreases his/her learning and adaptation thus having negative effects on positive coping behavior [10].

The reaction of the patient against the disease, his/her adaptation process to the disease and the evaluation of his/her reactions of coping with the disease are among the most important responsibilities of the nurse. Evaluations regarding these aspects should be carried out following MI in order to improve the life qualities of patients and to enhance the psychosocial adaptation of the patients to the disease. In the light of these findings, the objective of this study was to determine the relationship between the psychiatric symptoms in patients followed up with myocardial infarction and problem solving skill.

Methodology

Study design and sample

The study was carried out in a descriptive manner in order to put forth the relationship between problem solving skills of patients who have undergone myocardial infarction and psychiatric symptoms. The study was carried out during October 2013-June 2014 at the Cardiology Polyclinic of a university hospital. The number of patients who applied to the polyclinic during that time period was 196 and the sample group of the study consisted of 81 patients diagnosed with myocardial infarction who are in the 18-65 age group, can communicate, are literate and have accepted to participate in the study. The questionnaire administered only once to the patients at least 6 months after Myocardial Infarction. The power of the test was determined as (1-β) 0.80.

Procedure

Polyclinic was visited 3 times in a week during the time period of the study. Data were acquired by the researcher via face-to-face interviews with the patients. The objective of the study was explained by the researcher prior to data acquisition. The interviews were carried out in a suitable room following the polyclinic examination and each patient interview lasted 30 minutes on average. Written consent was taken from Gaziantep University Clinical Studies Ethics Council Directorate, the head physician of the hospital where the study will be conducted and the Cardiology Department as well as written informed consent from the patients.

Measurement Tools

"Individual Introduction Form" prepared by the researchers, "Problem Solving Inventory" to determine the problem solving skills of the patients and "Brief Symptom Inventory" to evaluate the psychiatric symptoms were used for data acquisition during the study.

Individual introduction form: It is a form containing 19 questions prepared by the researchers in order to determine the socio-demographic properties of individuals (age, gender, occupation, settlement location, employment status etc.) as well as the properties related with MI (number of infarctions, when the infarction took place, evaluation of life after infarction etc.).

Brief Symptom Inventory (BSI): Brief Symptom Inventory is an instrument that evaluates psychological distress and psychiatric disorders in people. BSI collects data reported by patients for the evaluation. The test can be used for areas such as patient progress, treatment measurements, and psychological assessment. The BSI

assessment the areas such as behavior, cognition, depression, mental health, personality, social relationships. The Turkish adaptation of the Brief Symptom Inventory developed in 1992 by Derogatis was carried out by Şahin and Durak in 1994. A total of 53 items with the highest load in each factor were selected from among the 90 items scattered around the 9 factors of SCL-90-R and a similar brief inventory was obtained that can be applied in 5-10 minutes [11]. The Brief Symptom Inventory is a 53-item self-report inventory in which participants rate the extent to which they have been bothered (0="not at all" to 4="extremely") in the past week by various symptoms. The BSI has nine subscales designed to assess individual symptom groups: somatization (SOM, e.g., "Faintness or dizziness"), obsessive-compulsive (OC, e.g., "Having to check and double-check what you do"), interpersonal sensitivity (IS, e.g., "Feeling inferior to others"), depression (DEP, e.g., "Feeling no interest in things"), anxiety (ANX, e.g., "Feeling tense or keyed up"), hostility (HOS, e.g., "Having urges to break or smash things"), phobic anxiety (PHB, e.g., "Feeling uneasy in crowds, such as shopping or at a movie"), paranoid ideation (PAR, e.g., "Others not giving you proper credit for your achievements"), and psychoticism (PSY, e.g., "The idea that something is wrong with your mind"). It was put forth following the factor analysis carried out that the scale consisted of 5 factors which are "Anxiety (13 items)" "Depression (12 items)", "Negative self (12 items)" "Somatization (9 items)" and "Hostility (7 items)" [12]. There is no cut point for the evaluation of the scale. The lowest score that can be obtained from the scale is 0, whereas the highest score is 212. The increase of scores obtained from BSI indicates more frequent psychiatric symptoms in individuals. The inventory is applied on adolescents and adults. It was put forth that the Cronbach Alpha internal consistency coefficients varied between 0.71 and 0.85 [11]. The scale adapted into Turkish by Şahin and Durak were used in three different studies and the Cronbach Alpha internal consistency coefficients obtained from the total scores were determined to be between 0.96 and 0.95. The Cronbach Alpha coefficients obtained in our study for the sub-scales vary between 0.53 and 0.78.

Problem Solving Inventory (PSI): The Problem Solving Inventory designed to asses people's perceptions of their problem solving ability and problem solving styles by Heppner and Peterson (1982). The Turkish validity and reliability were carried out by Şahin and Heppner (1993) [13]. PSI consists of 35 items and three factors [14]. It is a Likert type scale with a score range of 1-6 that can be applied to adolescents and adults. Example "when confronted with a problem, I tend to do the first thing that I can think of to solve it". Its selections are, "I always act like this (1 point)" to "I never act like this (6 point)". Items 9, 22 and 29 are excluded from the scoring of the scale. Items numbered 1, 2, 3, 4, 11, 13, 14, 15, 17, 21, 25, 26, 30 and 34 are scored inversely. As a result of the factor analysis carried out, six factors were determined for the scale which are hasty approach (9 items), minded approach (5 items), avoidant approach (4 items), evaluative approach (3 items), self-confident approach (7 items), planned approach (4 items). These six factors are used in the studies carried out in Turkey [15-17]. The lowest score that can be obtained from the scale is 32, whereas the highest score is 192. There is no cut point for the evaluation of the scale. Low scores in PSI scale indicates high problem solving skill, whereas high scores in the scale indicate low problem solving skills. The Cronbach Alpha reliability coefficient of the original scale was determined as 0.90, whereas the coefficients obtained for the sub-scales were determined between 0.72 and 0.85. The Cronbach Alpha reliability coefficient of the scale was determined as 0.88. The Cronbach Alpha coefficient of the problem solving inventory was determined as 0.75 in this study. The Cronbach Alpha coefficients obtained in our study for the sub-

scales varied between 0.65 and 0.92. PSI has been utilized in over 60 published investigations. Several investigations have examined the relationship between problem-solving appraisal and indices of physical and psychological health. For example, those who appraise themselves as having confidence, personal control, and approaching problems reported fewer personal problems, more positive self -concepts, and fewer disfunctional thoughts and irrational beliefs, less social anxiety, less trait anxiety, more intuitive and dependent decision making styles, and more interpersonal assertiviness, fewer physical health symptoms, better psychological adjustment [13].

Data analysis

SPSS (Statistical Package for Social Sciences) for Windows 22 software was used for statistical analyses for the evaluation of the data acquired in this study. Percentile, arithmetic average and standard deviation were used to examine the informative properties of individuals. Pearson correlation analysis was used to determine the relationship between pshychiatric symptoms and problem solving skill. A significance level of $p<0.05$ was accepted.

Results

It was determined that the age average of the patients who participated in this study were 54.60 ± 8.14 and that%76.5 of the patients were male. It was determined that 42% of the patients were primary school graduates, 75.3% lived in a city, 61.7% were currently unemployed, 41.9% were self-employed, 65.4% had an income less than their expenses, 6.2% had to quit their jobs because of the disease (Table 1).

It was determined that 72.8% of the patients had a myocardial infarction for the first time, 55.6% had a myocardial infarction during the past one year, 49.4% had a history of heart disease in the family, 35.8% lost a relative in his/her family due to MI. It was determined

Properties	X ± SS
Age	54.60 ± 8.14
	S (%)
Gender	
Female	19 (23.5)
Male	62 (76.5)
Level of education	
Literate	18 (22.2)
Primary School	34 (42.0)
Secondary School	14 (17.3)
High School	10 (12.5)
University	5 (6.0)
Residence	
City	61 (75.3)
District	15 (18.5)
Village	5 (6.2)
Employment status	
Yes	31 (38.3)
No	50 (61.7)
Vocation (n=31)	
Laborer	11 (35.5)
Housewife	2 (6.5)
Government Clerk	5 (16.1)
Self-employed	13 (41.9)
Family income level	
Income equal to expenses	27 (33.4)
Income less than expenses	53 (65.4)
Income more than expenses	1 (1.2)
Quit job due to disease	
Yes	5 (6.2)
No	76 (93.8)

Table 1: Distribution of Socio-Demographic Properties of Individuals (n=81).

Properties	S (%)	Properties	S (%)
Time passed after heart attack		**Existence of stressor prior to infarction**	
6 - 12 months	45 (55.6)	Yes	35 (43.2)
1 – 2 years	11 (13.6)	No	46 (56.8)
2 - 5 years	12 (14.8)		
6 years and above	13 (16.0)		
		Stressor (n=33)	
		Work stress	11 (33.3)
Number of infarctions		Family problems	10 (30.3)
1	59 (72.8)	Death of relative	9 (27.3)
2	16 (19.8)	Financial problems	1 (3.0)
3	6 (7.4)	Jail sentence	1 (3.0)
		Health problems	1 (3.0)
Heart disease story in the family		**Negative impact of MI on life style**	
Yes	40 (49.4)	Yes	51 (63.8)
No	41 (50.6)	No	29 (36.2)
Any family member passed away due to MI		**Life evaluation status after infarction**	
Yes	29 (35.8)	Bad	22 (27.2)
No	52 (64.2)	Moderate	38 (46.9)
		Good	21 (25.9)
		Defined personality trait	
		Hasty	5 (6.2)
		Excited	1 (1.2)
Stressful life prior to infarction		Nervous	24 (29.6)
		cool	29 (35.8)
Yes	54 (66.7)	Hasty, nervous	13 (16.0)
No	27 (33.3)	Hasty, excited	3 (3.7)
		Excited, nervous	4 (5.0)
		All	2 (2.5)
Total	81	Total	81

Table 2: Distribution of the Properties of Individuals With Regard to the Disease.

Scales	X ± SS	Min-max scores	Possible Min–max value
Brief Symptom Inventory			
Depression	10.6 ± 7.1	0.0-30.0	0.0-48.0
Anxiety	5.1 ± 4.2	0.0-16.0	0.0-52.0
Negative self	5.1 ± 4.8	0.0- 20.0	0.0-48.0
Somatization	7.0 ± 5.1	0.0-25.0	0.0-36.0
Hostility	5.7 ± 3.8	0.0-18.0	0.0-28.0
Severity of illness index	0.6 ± 0.3	0.8-1.64	0.0-4.0
Problem solving inventory			
Hasty approach	39.4 ± 9.4	14.0-54.0	9.0-54.0
Minded approach	13.8 ± 6.1	5.0-30.0	5.0-30.0
Avoidant approach	18.4 ± 6.4	4.0-24.0	4.0-24.0
Evaluative approach	7.8 ± 3.1	3.0-15.0	3.0-18.0
Self-confident approach	23.5 ± 6.4	12.0-33.0	7.0-42.0
Planned approach	9.4 ± 3.2	4.0-17.0	4.0-24.0
PSI TOTAL	112.6 ± 16.3	68.0-145.0	32.0-192.0

Table 3: Brief Symptom Inventory and Problem Solving Inventory Subscale and Total PSI Score Averages of Patients.

that 66.7% evaluated their life as stressful prior to the infarction, 43.2% had experienced a stressor prior to the infarction and that for 33.3% this was a business related stressor. It was determined that there was a negative change in the lives of 63.8% following myocardial infarction, that 27.2% evaluate their lives as bad after infarction and that 35.8% define themselves as a calm person (Table 2).

The BSI inventory sub-scale score averages of the patients who participated in the study were seen in table 3. The most score was obtained from the depression scaleteh second was somatization determined as 10.6 ± 7.1 for depression, 5.1 ± 4.2 for anxiety, 5.1 ± 4.8 for negative self, 7.0 ± 5.1 for somatization, 5.7 ± 3.8 for hostility and 0.6 ± 0.3 for severity of illness. When PSI subscales score evaluated ıt

was seen that the most score was obtained from hasty approach, the PSI total score average was determined as 112.6 ± 16 (Table 3).

It was determined that there was no statistically significant relationship between the hasty approach, minded approach, avoidant approach, planned approach which are the sub-scales of PSI and the BSI sub-scale score averages ($p>0.05$); that there was a negative and statistically significant relationship between the evaluative approach which is a sub-scale of PSI and depression, negative self, hostility and severity of illness indexes which are sub-scales of BSI ($p<0.05$) and that there was no statistically significant relationship between anxiety and somatization ($p>0.05$) (Table 4).

It was determined that there was a positive and statistically significant relationship between the self-confident approach which is a sub-scale of PSI and somatization which is a sub-scale of BSI ($p<0.05$) and that there was no statistically significant relationship between depression, anxiety, negative self, hostility and severity of illness index sub-scales ($p>0.05$). It was also determined that there was a negative and statistically significant relationship between the PSI score average and hostility which is a sub-scale of BSI ($p<0.05$) and that there was no statistically significant with the score averages of other sub-scales ($p>0.05$) (Table 4).

Discussion

It is stated that psychiatric symptoms (depression, anxiety and hostility) are observed more in heart disease patients in comparison with healthy individuals [18]. Jacqueline et al. [19], stated that anxiety was a predictor of cardiac rehospitalization and frequent visits at the cardiac outpatient clinics [19]. Depression is associated with an increased risk of cardiac morbidity and mortality after an acute myocardial infarction and post myocardial infarct depression that proves treatment-resistant

Scales	BSI subscales					
	Depression	**Anxiety**	**Negative self**	**Somatization**	**Hostility**	**Severity of illness index**
Hasty approach	r=-0.92, p=0.413	r=-0.131, p=0.245	r=0.064, p=0.571	r=-0.192, p=0.085	r=-0.196, p=0.79	r=-0.132, p=0.239
Minded approach	r= -0.67, p= 0.553	r= 0.007, p= 0.954	r=-0.127, p= 0.258	r= 0.041, p= 0.717	r= -0.166, p= 0.139	r= -0.79, p= 0.483
Avoidant approach	r=-0.16, p=0.889	r= -0.114, p= 0.311	r= 0.096, p= 0.394	r= 0.025, p= 0.821	r= 0.023, p= 0.841	r= 0.009, p= 0.934
Evaluative approach	r=-0.292, p=0.008	r= -0.218, p= 0.50	r= -0.329, p= 0.003	r= -0.42, p= 0.710	r= -0.323, p= 0.003	r= -0.327, p= 0.003
Self-confident approach	r= 0.126, p= 0.263	r=0.050, p=0.658	r= -0.061, p= 0.590	r= 0.255, p=0.021	r= -0.131, p= 0.244	r= 0.083, p= 0.461
Planned approach	r= 0.114, p= 0.310	r=0.117, p=0.298	r=-0.012, p= 0.914	r= 0.207, p= 0.063	r=-0.061, p= 0.591	r= 0.114, p= 0.313
TOTAL PSI	r=-0.085, p= 0.453	r=-0.124, p= 0.270	r=-0.056, p=0.622	r=0.017, p= 0.880	r=-0.278, p=0.012	r=-0.121, p= 0.282

Table 4: Relationship Between Brief Symptom Inventory and Problem Solving Inventory.

indicates a negative prognosis of the prevailing cardiological condition [20,21]. Patients with depression following MI are less likely to adopt a healthy lifestyle and are less likely to adhere to recommended secondary prophylactic medication than patients without depression [22]. Hosseını et.al. stated in their study that 40.3% of the patients have both anxiety and depression [23], Güneş et.al. put forth that 67.5% had anxiety and 50% had depression [4]; Keskin and Gümüş put forth that anxiety level was moderate [24]; whereas Dirik and Şahin put forth that the hostility levels of patients in their study were lower [25]. These results were in parallel with those of our study.

Coping strategies are used to modify psychological and physiological reactions of stress and are thought to have a buffering effect on stress. The coping process includes behavioral efforts but also cognitive dimensions because action is preceded by an appraisal of both the situation at hand and of available coping resources [26]. It was observed in the patients who participated in the study that hasty approach, avoidant and self-confident sub-scale scores were higher in comparison with other sub-scales. CAD has a wide range of negative effects on the physical, mental health of the individual as well as his/her adaptation to the environment due to the limitations it enforces and these patients are re-hospitalized in a shorter time than expected, they live with this disease until the end of their lives after discharge and their adaptation is disturbed as the time they spent with the disease increases thus leading to physical, psychological, social and economic problems [9]. Individuals who go through such a period experience difficulties in using the effective coping mechanisms they used to solve their problems in the past [3]. In this study PSI total score average was determined as 112.6 ± 16. In a study that has done with nursing students the PSI score found as 77.71, In another study that conducted with police officers the score found as 95.23 [27,28]. It can be stated in this study that the individuals do not try to understand the situation while deciding on the solution, that they do not evaluate all relevant information about the issue, that they do not think about the possible outcomes and that they do not trust themselves with regard to the solution of the problem. In addition, it can be stated that patients mostly use avoidant approach which is one of the sub-scales of problem solving skills and that they do not consider acquiring data related with the solution of the problem they are facing, that they do not put enough effort for coping if the applied solution does not succeed and that they do not think about what worked and what did not after the problem is solved.

A negative and statistically significant relationship was determined between the evaluative approach which is a sub-scale of PSI and depression, negative self, hostility and severity of illness index which are the sub-scales of BSI (p<0.05). According to the results of our study, the depression, negative self, hostility and severity of illness index level of the patients increase as their evaluative approach decrease. Individuals who use evaluative approach are those who consider acquiring information related with the solution of the problem; who do not experience anxiety related to the coping with the problem when the solution they try is unsuccessful and who think about what has worked or not following the solution of the problem [29]. It is put forth that MI results in a sense of loss in individuals along with damaging of the sufficiency-worthiness emotion, that the identity is also damaged along with the heart, that it threatens the self-sufficiency and occupation of the individual, results in the individual feeling that his/her life goals and sexuality are under threat or decreased, that he/she will not be able to live as he/she wants from then on and that everything will be limited [4,6,30-36]. The increase in depression, negative self perception and hostility effect the evaluative approach as negatively.

A positive and statistically significant relationship was determined between the self-confident approach sub-scale and the age of the patients as well as somatization which is a sub-scale of BSI (p<0.05). Somatization is the physical expression of mental problems and psychosocial stress [37]. Patients who undergo MI focus all their attention, energy and emotions in their heart region and perceive even minor physiological changes within normal limits as a coronary infarction [4,34]. Self-confident approach determines the self-confidence of the individual in his/her problem solving skill and whether he/she sees himself/herself to be sufficient for putting effort in solving the problem [15]. It was put forth as a result of our study that the self-confidence of the individuals decreases with increasing somatization symptoms.

It was determined that there is a negative and statistically significant relationship between the total PSI score average and BSI subscale hostility (p<0.05). It was observed that when the problem solving skills of the MI patient getting worse the hostility is getting increased. Anger is one of the most frequently encountered responses to a medical disease. Hostility is defined as the negative belief systems towards other individuals and it affects the health of the individual directly by making the individual more prone to anger [25]. In addition, hostility is also defined as a behavior type that encourages people to hurt others or to damage objects [38]. Suppressed anger may result in decrease of self-respect and depression. Medical diseases might lose to the loss of a body part, physical functions, independency, social roles, job, status, economic status, goals or dreams and thus the individual might

perceive the disease as a sort of loss [39]. The limitations experienced due to the disease, loss of control, changing of life objectives increase anxiety, cause a sense of weakness which is expressed with anger [24]. In addition, it is thought that as a result of the decrease in problem solving skills hostility feelings of MI patients getting increase.

Implications for Practice

According to the results of our study, it was observed that patients act very quickly when faced with problems after MI, that they are very reluctant to solve the problems, that they refrain from facing them, that they do not trust themselves for solving these problems and that they do not think sufficiently on problem solving. Hence, it is thought that the preparation of educational programs related with developing the problem solving skills of these patients for their hospital discharge education is very important. In this study, it was determined that psychiatric symptoms these seen in MI patients effect the evaluative problem solving skills of MI patients in a negative way. It is suggested that nurses evaluate the reactions of the patients to the disease when working with patients who have undergone MI; that they should support the patients for coping with anxiety, anger, horror and fear of death; that they should work with the liaison psychiatry nurse if necessary to evaluate the patients and arrange their care.

Limitations of The Study

This study was carried out only on outpatients followed up with MI diagnosis and patients were not included in the evaluation. It is suggested that in the future studies are carried out that cover all coronary artery diseases and in addition that interventional studies are carried out related to the problem solving skills of these patients followed up with an evaluation of its effectiveness.

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