Healthy Behaviors and Illness Perception of Patients with Myocardial Infarction the First 3 Months

Miyokard İnfarktüsü Geçiren Hastalarda İlk Üç Aydaki Sağlıklı Yaşam Biçimi Davranışları Ve Hastalık Algısı

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ABSTRACT

Purpose: This study was conducted to determine the healthy lifestyle behaviors and illness perception of patients within the first three months after suffering from a myocardial infarction.

Method: This descriptive and cross-sectional study was conducted with 112 patients who had myocardial infarction and underwent coronary angiography between November 2016 and August 2018. The data of the study were obtained by using "Patient Information Form", "Health Promoting Lifestyle Profile-II", and "Illness Perception Questionnaire". Descriptive statistics, independent sample t test, one-way analysis of variance and the analysis of variance for repeated measures were used in SPSS 16 program in order to analyze the data.

Results: It was observed that total and subscale mean scores of the patients for the Health Promoting Lifestyle Profile-II increased over time, and the patients developed healthy behaviors ($p<0.01$). When it came to the attributions consenting the disease, the highest mean score was observed in the personal control subscale; whereas, the lowest mean score was observed from the timeline (cyclical) subscale ($p<0.01$). In terms of causes of disease, the highest mean score was obtained from the risk factors subscale; whereas, the lowest mean score was obtained from accident and bad luck subscale ($p<0.01$). The mean score of the patients for the illness identity subscale in three evaluations increased over time. Likewise, the patients were found to strongly believe that the number of symptoms associated with the disease was high ($p<0.05$).

Conclusion: The healthy lifestyle behaviors of the patients were found to be more positive in receiving regular follow-up. Moreover, it appeared that they were able to better understand the symptoms of their disease over time. They positively believed in being able to manage their disease and treatments.

Keywords: Myocardial Infarction, Healthy Lifestyle Behaviors, Illness Perception, Public health Nursing, Home Visit

1.Introduction

The life expectancy of human beings seems to be getting longer both around world as well as in Turkey. This entails that the world's population is rapidly aging and, in parallel, the number of chronic diseases is also rising (Mozaffarian et al., 2016; Turkey Household Health Survey, 2017). One of the most important chronic diseases threatening individuals, especially in Turkey, is cardiovascular diseases (Lijing et al., 2016; Özkan, 2013; Turkey Household Health Survey, 2017). Each year, 32.4 million people around the world develop Myocardial Infarction (MI) from cardiovascular diseases (Lijing et al., 2016; Turkey Household Health Survey, 2017). While the population of Turkey is young, as in other developing countries, we nevertheless suffer from a high rate of mortality due to coronary diseases, as in developed societies which have an old population structure. This situation is worrisome for concern for both the present and future (Chaves & Park, 2016). Every year in Turkey, 340,000 people among the adult individuals aged 37 and over die from coronary artery diseases. 400 to 420,000 people are diagnosed with coronary artery disease each year as well (Onat et al., 2015).

Coronary artery disease (CAD), caused by myocardial infarction, has an adverse impact on an individuals' family, social, and working life, and moreover impairs their quality of life. The World Health Organization (WHO) states that development of MI can be reduced by as much as 70% through making effective lifestyle changes (Mozaffarian et al., 2016; Lijing et al., 2016; Pitthayapong et al.,2017). The INTER-HEART study showed that cardiac mortality can be reduced by 20 to 40% by following secondary prevention measures such as strictly monitoring blood glucose, lipid level, and blood pressure levels, quitting smoking, doing an adequate amount of physical activity, and following an appropriate diet after suffering first myocardial infarction (Conceição et al., 2015; Mozaffarian et al., 2016; Lijing et al., 2016). Therefore, it is very important to give cardiac

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rehabilitation to subjects suffering from MI and provide them with training.

The stages of cardiac rehabilitation following myocardial infarction include the in-hospital period, transition period (intensive care-service-home), outpatient exercise programs, and encouraging subjects to adopt healthy behaviors in their lives. The faster the cardiac rehabilitation, patient adaptation and transition periods, the faster the return of patients to normal life and work, the easier their motivations to social life. Well-managed cardiac follow-up and rehabilitation indicates that patients have a better quality of life by decreasing the hospitalization, depression, recurrent acute coronary syndrome (ACS) and stroke and gain healthy lifestyle behaviors (HLSB). The studies have showed that the one's own disease-health perception and reflecting this on the habits have a great role on healthy lifestyle behaviors (Bahar, 2008; Conceição et al., 2015; Kristian et al., 2013; Lijing et al., 2016; Özarslan, 2013; Pitthayapong et al., 2017).

Illness perception (IP) refers to a patient's beliefs about their disease and the cognitive appearance of the disease (Kocaman et al., 2007). It is necessary to regulate and monitor follow-up and treatment of subjects who have suffered from MI, ensure that they adopt healthy lifestyle behaviors and integrate them into their lives, and ensure the positive development of illness perception. However, the studies have revealed that cardiac rehabilitation and information training are not applied in the desired and expected level in MI patients and follow-ups are partially performed. Patients have lack of knowledge out of hospital control (Bahar, 2008; Kocaman et al., 2007; Özarslan, 2013; Kurçer and Özbay, 2011; Öztürk et al., 2011). Nurses play an important role in patient care and treatment in order to help subjects adopt healthy lifestyle behaviors, shorten their stay in hospital, and enhance their quality of life.

The role of public health nurses having the primary responsibilities in health protection and promotion is very important here. In this context, the most important purpose of nurses is to help patients adopt healthy lifestyle behaviors, ensure a positive change in illness perception, and also help them to stay healthy at the highest level possible (Bahar, 2008; Kocaman et al., 2007; Kristian et al., 2013; Kurçer and Özbay, 2011; Özarslan, 2013; ; Öztürk et al., 2011). For this purpose, nurses should primarily follow and evaluate the health behaviors and the change in illness perception based on different stages of the disease.

2. Aim

The aim of the study is to determine healthy lifestyle behaviors and illness perception of patients within the first three months after suffering a myocardial infarction by following up them at certain stages of the disease in order to see the time-dependent change in the effect of myocardial infarction on their lives.

3. Methodology

3.1. Design

This study was descriptive and cross-sectional trial. In order to conduct the study, the official permission from the institution where the study would be conducted and the written consent of the patients participating in the study were obtained. The ethics commission approval of the study was obtained from Harran University Non-Invasive Clinical Trials Ethics Committee with the date of "05/10/2016'' and number of "74059997.050.01.04/172". In addition, for the scale used, permissions were obtained by e-mail from the researchers who conducted the validity-reliability study of the scales.

3.2. Participants

The sample of this study consisted of 112 patients who had suffered from between November 2016 and December 2017 in a hospital located in the city of Şanlıurfa and met the inclusion criteria. The the inclusion criteria of the study were as follows;

- Been admitted to coronary intensive care upon being diagnosed with myocardial infarction, and moreover having undergone a coronary angiography leading to surgery based on result of angiography.

- Not using antipsychotic drugs

- Being previously diagnosed with known coronary artery disease,

- Being rejected for coronary by-pass surgery following the angiography.

- Having a fully conscious mind during the acute period of the disease.

- Being voluntary to participate in the study,

- Having no communication problem and being able to express themselves in order to obtain the data,

- Accepting to be followed up during the initial 3-month period.

Prior to commencing the study, official permission was obtained from the institution where the study was to be conducted, and written consent from the participants was also obtained as well. Additionally, permission to use the scales was obtained by e-mail from the researchers who conducted their validity and reliability study.

3.3. Measurements

Patient Information Form:

Prepared by the researcher, this form consists of questions that ask socio-demographic characteristics and health condition of the patients. It questions gender, age, height, weight, educational background, marital status, employment status, occupation, social security, and income/expense levels, as well as those with whom they live among socio-demographic characteristics. Health condition-related characteristics, on the other hand, include the questions

related to smoking, alcohol use, chronic diseases, treatment, diet, and exercise.

Health Promoting Lifestyle Profile-II:

The Health Promoting Lifestyle Profile was originally developed in 1987 by Pender et al.,. Turkish validity and reliability study of this scale was conducted by Esin in 1997. Later, Walker et al., (1996) updated this scale and renamed it as the Health Promoting Lifestyle Profile -II (HPLP-II). The validity and reliability study of this scale was conducted by Bahar et al., (2008). Having 52 items, HPLP-II is a 4-point Likert-type scale including the options of 'never', 'sometimes', 'frequently', and 'regularly'. The scale has six subscales; 'Health Responsibility', 'Physical Activity', 'Nutrition', 'Spiritual Growth', 'Interpersonal Relations', and 'Stress Management'. The Cronbach's Alpha coefficient of the scale is 0.92, meaning that it has a high degree of reliability. The Cronbach's Alpha coefficient of the scale within the context of this study was 0.94. The lowest and highest total scores of the scale are 52 and 208, respectively. Higher scores signify that individuals have more healthy lifestyle behaviors (10).

Illness Perception Questionnaire

The Illness Perception Questionnaire was developed by Weinmann in 1996 and then revised by Moss-Morris et al., in 2002. Kocaman et al., (2007) conducted a validity and reliability study of the questionnaire in the Turkish population. The questionnaire includes the dimensions of illness identity, causes, and attributions consenting the disease. The illness identity dimension addresses the 14 symptoms, which are most frequently associated with the disease, including pain, burning throat, nausea, difficulty in breathing, weight loss, fatigue, stiff joints, burning eyes, wheezing, headache, upset stomach, dizziness, insomnia, and lack of energy. For each symptom, the subject is first asked "if he/she has experienced this symptom since the onset of the disease", and then "whether or not he/she views this symptom to be associated with the disease". The dimension of attributions consenting the disease includes 38 items that are rated over a 5-point Likert type scale, and seven subscales, including timeline (acute/chronic), consequences, personal control, treatment control, understanding of illness, timeline (cyclical), and emotional representations. The timeline subscales investigate how the subject perceives the timing of the disease, and are further grouped as acute, chronic, and cyclical. The consequences subscale explores subject's beliefs about the possible effects on the severity of the disease, alongside physical, social and psychological functioning. Personal control subscale looks at one's internal control perception over the duration, course, and treatment of the disease. Treatment control subscale addresses the beliefs of the individual about the effectiveness of the treatment. Understanding of illness subscale examines how much the person understands or comprehends his/her disease. Emotional representations investigate the feelings of the person about the disease.

The dimension of causes of disease, is a 5-point Likert type scale consisting of 18 items. This dimension explores the one's thoughts about the possible causes of the disease

and includes four subscales, including psychological references (stress or anxiety, family problems, personality traits…), risk factors (e.g. genetic, smoking, alcohol use, aging…), immunity (germ or virus, low body resistance), accident or luck (e.g. accident, injury, bad luck). The validity and reliability study of the scale in Turkish population revealed that the alpha coefficients of the subscales of the attributions consenting the disease dimension varied between 0.69 and 0.77, whereas the alpha reliability coefficients of the subscales of the causes of the disease dimension varied between 0.25 and 0.72. In the present study, the alpha coefficient was found to be 0.66 in the subscales of the attributions consenting the disease dimension and 0.54 for the subscales of the causes of the disease dimension.

3.4. Application of the Study

Each patient to be included in the study was informed before the procedure. The patients were evaluated as follows:

1. **First evaluation**: The day before discharge; the stage 2 of the Myocardial Infarction.

2. **Second evaluation**: Four to five weeks after discharge; the stage 3 of the Myocardial Infarction.

3. **Third evaluation**: at the end of third month of discharge, starting as stage 4 of the Myocardial Infarction.

During the first evaluation, the patients were asked to fill out the Questionnaire, HPLP-II, and Illness Perception Questionnaire. The HPLP-II and Illness Perception Questionnaire were then filled out again during the second and third evaluations. While the data of the study were directly filled by 32 patients who had a high school education or higher, information from the remaining 80 patients was filled out via face-to-face interview. The data were collected in subjects' hospital rooms during the first evaluation, and then in their homes during the second and third evaluations. It took averagely 20 to 25 minutes for the patients to fill out the data collection tools.

3.5. Statistical Analysis

Descriptive statistics (i.e. number, percentage, mean), the independent samples t test, one-way Anova, and repeated measures Anova test were used to analyze the data.

Dependent variables were the scores obtained from Health Promoting Lifestyle Profile and Illness Perception Questionnaire for the first, second, and third evaluations.

Independent variables were both personal and disease-related characteristics.

4. Results

Sample Characteristics

It was found that the mean age of the patients was 51.9±8.4. 60.7% of the patients were above 50 years of age, and 63.4% were male. 28.6% of the patients had high school education or higher. The mean body mass index of the participants was calculated as 27.7±2.8. 83.9% of them were married, 46.0%

were housewives or retired, 58.9% were employed, and 54.5% had an income less than their expenditures. 73.2% of the patients had living with their spouse and children, and 94.6% had social security. 21.4% were smokers. 50.9% suffered from chronic disease. Among these chronic diseases, 66.6% of patients had hypertension, 12.3% had diabetes mellitus (DM), and 21.1% had DM+HT. 50% of the patients stated that they had medications. 48.2% of the participants stated that they mostly paid attention to their diet and 3.6% stated that they did an exercise program.

The Subjects' Scale Scores,

Table 1. The Mean Scores of the Patients from the overall HPLP-II and its Subscales

The total mean score of the patients for the Health Promoting Lifestyle Profile II was 123.9±25.2 in the first evaluation, increased to 136.0±25.4 in the second evaluation, and to 146.5±25.4 in the third evaluation (*p<0.01*).

The mean score of the patients for the interpersonal relations subscale was 21.6±5.5 in the first evaluation, increased to 23.9±5.2 in the second evaluation, and then to 26.2±5.0 in the third evaluation (*p<0.01*). In the nutrition subscale, the mean scores of the patients were 20.4±5.1, 22.3±4.9, and 23.6±4.5, respectively (*p<0.01*). The mean scores of all of the other subscales increased over time (*p<0.01*).

Table 2. Mean scores of the patients for the subscales of the Illness Perception Questionnaire: The mean score of the subjects for the illness identity subscale was 7.8±3.2 in the first evaluation. This mean score increased to 8.3±2.9 in the second evaluation, and then to 8.8±2.9 in the third evaluation (*p<0.01*).

The scores of the patients for the Timeline (Acute/chronic) subscale were 18.5±3.0, 18.2±2.8, and 17.9±2.8, respectively for the evaluations (*p<0.05*). On the other hand, the scores of the patients for personal control subscale were 18.8±3.0, 19.4±3.2, and 20.0±3.6, respectively for the evaluations. The difference between the variables was statistically significant (*p<0.01*). The same results were seen in other subscales, as well (*p<0.01*).

The mean scores of the psychological references and risk factors subscales of the causes of disease dimension increased over time (psychological references; 19.3 ± 4.6, 19.7±4.9, 21.6±5.2; risk factors; 21.1±4.1, 21.5±3.7, 23.3±4.3) (*p<0.01*).

Table 3. The HPLP-II Mean Scores of the Patients within the First Three Months After MI based on their Socio-Demographic Characteristics

When examining the healthy lifestyle behaviors of the MI patients within the first three months after MI based on their gender it was revealed that the women had 120.0±25.2 points in the first evaluation, 132.4±26.5 points in the second evaluation, and 144.3±23.4 points in the third evaluation; whereas, men had 126.1±25.1 points in the first evaluation, 138.0±24.8 points in the second evaluation, and 147.8±26.5 points in the third evaluation. Additionally, the total scores of both genders for Health-Promoting Lifestyle Profile II

increased over time (*p<0.05*). Upon comparison of the genders, men were found to have obtained higher scores in the first, second, and third evaluations (*p>0.05*).

The examination of the age groups revealed that the HPLP-II total scores of individuals below 50 years of age were 123.8±26.3, 141.1±25.9, and 151.4±26.8, respectively. Those who were above 50 years of age had scores of 123.9±24.7, 132.7±24.8, and 143.4±24.0 points, respectively. The HPLP-II mean scores of both age groups increased over time (*p<0.05*). Additionally, when the age groups were examined among themselves, the HPLP-II mean scores of 50-year-old and younger patients in the second and third evaluations were higher than the patients older than 50 years (*p>0.05*).

When the marital status of the patients was examined, it was determined that the mean scores of the patients in both groups increased over time (*p<0.05*). While the total mean score of HPLP II was 121.7±25.2 among married individuals in the first evaluation, this value increased to 135.5±22.5 among single or widowed individuals (*p<0.05*). When the smoking status of the individuals was examined, the mean score in all of three groups increased in each evaluation, but the difference between them was statistically significant (*p<0.05*). Those who gave up smoking and had the lowest mean score in the first evaluation obtained 118.0±28.9 points in the first evaluation, 133.9±23.6 points in the second evaluation, and 146.5±22.0 points in the third evaluation (*p<0.05*).

When examining educational background of the participants, it was determined that that the group showing the highest increase were those who had a high school education and higher and obtained the highest score in the third evaluation. A statistically significant correlation was found between the evaluations made for each group (*p<0.05*). When the working status of the individuals was examined, HPLP-II mean score of the employed patients was higher than the unemployed individuals in the third evaluation (*p<0.05*).

Table 4. The Mean Scores of the Patients for the Illness Identity Subscale of the Illness Perception Questionnaire in the First Three Months after MI Based on Their Socio-Demographic Characteristics

When comparing the gender and the illness identity subscale of the Illness Perception Questionnaire, it was shown that while the mean score of the women increased to 7.8±3.5, 8.8±2.9, and 9.3±2.6 over time, the mean score of the men increased to 7.8±3.0, 8.0±2.9, and 8.4±3.0, over time (*p<0.05*). There was no statistically significant difference between the genders in terms of the illness identity subscale (*p>0.05*). The results of the gender variable were also the same as those of the age variable.

Upon evaluation of marital status, it was determined that married individuals had 8.0±3.2 points in the first evaluation, 8.5±3.0 in the second evaluation, and 8.9±3.0 in the third evaluation. Accordingly, the statistical difference between them was significant (*p<0.05*).

Table 5- The Correlation Between the Patients' the Health Promoting Lifestyle Profile II Total Score, Illness Identity Subscale Score, Causes of Disease Total Score, and Attributions Consenting the Disease Total Score

The correlation between the total score of Health Promoting Lifestyle Profile- II and the illness identity score in the first evaluation was found as -0.366 which in turn signified that it was a negative and weak correlation ($p<0.01$). Correlation between the second total score of Causes of Disease subscale and the second evaluation of HPLP-II having the highest correlation was calculated and a moderate positive correlation was determined (0.511, p<0.01).

5. Discussion

One of the most important elements of the nursing profession is patient-nurse cooperation. This cooperation is of great value in every aspect of the patient's treatment and nursing care. This cooperation can be strengthened by determining the current status of the patient/individual as well as revealing positive and negative aspects of their condition for them, and raising the patient's awareness about her/his lifestyle. In this study, which set out to determine the current condition of the patient, the HPLP-II and IPQ mean scores of those who suffered from myocardial infarction changed over time based on stages of the disease.

The total mean scores of the patients from HPLP-II were found to increase over time and they developed healthy behaviors ($p<0.01$; Table 1). In the literature, no study was found conducting regular follow-ups related to healthy lifestyle behaviors and illness perception of the patients suffering from myocardial infarction. In one study involving patients with coronary artery disease it was found that healthy promotion behaviors were low and the technique of confronting with patients was important to improve this behavior. In parallel with this result, the effect of home visits, face-to-face training, and care carried out by the nurse appeared with higher scores in this study (Zou et al., 2017). Another study revealed that electronic nursing care systems did not have enough power to achieve health lifestyle behavior changes in individuals (Hanlon et al., 2017). The results of this study indicated the importance degree of nursing follow-ups in terms of both contributing to the literature and having high mean scores. It is thought that regularly and periodically follow up of those suffering from chronic disease in particular would contribute to the literature, and considerably underline the importance of patient-nurse cooperation.

The correlation between HPLP-II total score and illness identity score of the patients was found to be -0.366 in the first evaluation, in turn revealing that there was a negative and weak correlation ($p<0.01$, Table 5). This revealed that as the patients developed healthy behaviors, they had a strong belief that number of symptoms associated with disease was low. This was a desired and expected result.

Men were found to have higher scores than female counterparts for the Health Promoting Lifestyle Profile -II

(Table 3, $p>0.05$). Other studies (Küçükberber et al.,2011; Thompson and Lewin, 2000) conducted on cardiac subjects have drawn the same results. The reasons behind this may be inadequacy of the health promotion programs given to women in our society, lower levels of education in women than men, and their lower employment in working fields compared to men.

The HPLP-II mean score in those under 50 years of age increased from 123.8±26.3 to 151.4±26.8, whereas, it increased from 123.9±24.7 to 143.4±24.0 among individuals above 50 years of age ($p<0.01$; Table 3). This result showed that healthy lifestyle behaviors developed more positively in individuals below 50 years of age. The findings of other studies also seem to support this result (Küçükberber et al., 2011; Thompson and Lewin, 2000). In contrast to this conclusion, one study reported that geriatric patients adopted more specific personal care behaviors (e.g regular exercise and dietary restrictions) than their younger counterparts (Masleh and Darawad, 2015). In the present study, the reason behind why those under 50 years of age had higher HPLP-II scores was thought to be due to the fact that younger people tend to place more importance on this issue, investigate health promotion behaviors, and adopt those behaviors into their lives. Furthermore, the result of the present study is supported by the fact that as the patients get older, their skills of coping with chronic diseases decrease and they experience difficulties in accessing health promotion programs.

Examination of the correlation between marital status and HPLP-II scale revealed that those who were married saw a 26-point increase in mean score over time; whereas, their widowed individuals had a 6-point increase ($p<0.01$; Table 3). In their study, Alkan et al., (Alkan et al., 2018) observed that married individuals developed healthier lifestyle behaviors than their single counterparts. The fact that married individuals developed more healthy lifestyle behaviors compared to single individuals was thought to be associated with the fact that the regular lifestyle gained by the marriage life, fulfilling their responsibilities and feeling the support of the individuals whom they are responsible for. However, higher HPLP-II total score of widow or single individuals in the first evaluation compared to the married ones is a thought-provoking result ($p<0.05$, Table 3).

The correlation between education status and HPLP-II indicated that those who obtained the highest mean had high school and higher education ($p<0.01$; Table 3). Similar results were obtained in the literature (Küçükberber et al., 2011; Thompson and Lewin, 2000). Additionally, another study showed that the training provided to patients had a positive effect on their health behaviors (Pitthayapong et al., 2017). Education is one of important components in one's lifestyle. As individuals' level of education increases, their level of awareness about their own health increases. Both this study and literature review suggest that a higher level of educational positively affects the realization and implementation of HPLP II.

When attributions consenting the disease dimension were examined in the present study, it was determined that the highest mean score was obtained in the personal control

subscale in all evaluations; whereas, the lowest score was obtained in the timeline (cyclical) subscale ($p<0.01$; Table 2). The fact that mean score of personal control increased over time indicated positive beliefs about the patient's controlling the disease. The increase of the timeline (cyclical) mean score over time signifies the frequency - cyclical nature - course of the condition. The mean score of understanding of illness decreased in the third evaluation (Table 2, $p<0.01$). This result showed that the patient had a reduced understanding about illness. This result was compatible with result of the study conducted by Karabulutlu et al., in 2015 on cancer subjects (Karabulutlu and Karaman, 2015). In a previous study, patients asserted that being sensitive against the disease complications affected their own care. In other studies, it was determined that those having more severe symptoms were engaged in general personal care (Banik et al., 2018; Kessing et al., 2016; Robles et al., 2017). High score of personal control in regular evaluations after MI in the present study suggested that the patient investigated his/her disease over time and took it under control by applying regular treatment and health lifestyle behaviors.

When it came to causes of disease dimension, the highest mean score was observed in risk factors subscale, whereas the lowest mean score was found in accident or bad luck subscale (Table 2). This result was also found in the correlation table. A moderate positive correlation was determined between the second evaluation of the HPLP-II and second total score of causes of disease subscale (0.511, $p<0.01$, Table 5). In this context, as the cause of the disease, the patients considered mostly factors such as hereditary, smoking, poor medical care history, own behaviors, alcohol usage, and aging. In contrast, they considered least factors such as accidents, injury, and bad luck. Other studies also support this result, as well (Abubakari et al., 2012; Karabulutlu and Gündüz, 2016).

While the illness identity mean score of female patients was the same with men in the first evaluation, they received higher score in the third evaluation ($p<0.01$; Table 4). The fact that the illness identity scores increased over time revealed that patients tended to strongly believe that the number of symptoms associated with the disease was high. One previous study revealed emotional representation of female patients was high (Karabulutlu and Karaman, 2015;Kessing et al., 2016). In the present study, it was thought that factors such as fear, the feeling of death and staying in intensive care among women during the MI period were effective in highness of this result.

When the age and illness perception subscales of the patients were examined, an increase of 2 points was identified in the timeline (cyclical) subscale among subjects who were at 50 years of age and younger and the score was higher than those of all of other subscales ($p<0.01$; Table 4). The literature suggests that the age of patients serves as an important variable when it comes to the perception of disease. In their study, Karabulutlu et al., (Karabulutlu and Karaman, 2015; Kessing et al., 2016) revealed that the scores of the patients between the ages of 41 and 50 years for consequences perception were high. This result of the present study also suggested that those in this age group experienced the natural course of the disease.

When the marital status and the illness perception of the patients were examined, the highest score increase in married individuals was observed in the treatment control and timeline (cyclical) subscales ($p<0.01$; Table 4). This result suggested that marital life was effective in individuals' treatment control and adjustment to their disease.

Upon examination of education level and illness perception it was observed that as the patients' level of education increased, their scores of personal and treatment control subscales increased significantly ($p<0.01$; Table 4). There are studies whose findings support this result (Abubakari et al., 2012; Karabulutlu and Gündüz, 2016; Robles et al., 2017). It is thought that increased educational levels of the individuals encouraged them to focus more on the symptoms about their diseases as a result of increased awareness and have strong beliefs indicating that they can cope with their disease through appropriate treatment and disease control.

Limitation of the Study:

First limitation of this study is that since a cross-sectional design was used, causal relationships between the variables could not be investigated. A second limitation is that it was based on statements of the patients, the possibility of reporting the case incorrectly was ignored. Finally, the generalizability of the findings is limited to the sample characteristics.

Summary Statement

What is already known about the topic?

- Coronary artery disease (CAD), caused by myocardial infarction, has an adverse impact on individuals' family, social, and working life, and moreover decreases their quality of life.

- The studies have indicated that the person's own disease-health perception and reflecting this perception onto the behaviors have a great role on healthy lifestyle behaviors

- It is seen that patients have lack of knowledge out of hospital control

What this paper adds

- In this study determining the current condition of the patient, it was determined the HPLP-II and IPQ mean scores of the patients suffering from myocardial infarction changed over time according to the stages of the disease.

- In the literature, no study was found conducting regular follow-ups related to healthy lifestyle behaviors and illness perception of the patients suffering from myocardial infarction.

- The results of this study showed the importance degree of nursing follow-up in terms of both contributing to the literature and having high mean scores. It is thought that regular and periodic follow-up of a patient group having

a chronic disease would contribute to the literature and emphasize considerably the importance of patient-nurse cooperation.

The Implications of This Paper:

- In this study, it was seen in the regular follow-up that the health lifestyle behaviors of patients were more positive and they could better understand the symptoms of their disease over time. In addition, they had positive beliefs stating that they can control their disease and treatment.

Conclusions

In this study, it was seen in the regular follow-up that the health lifestyle behaviors of patients were more positive and they could better understand the symptoms of their disease over time. In addition, they had positive beliefs stating that they can control their disease and treatment.

Recommendations

It is recommended for especially nurses to organize the health promotion program applications about the development of healthy behaviors and positive development of illness perception in the individuals/patients as well as conducting regular home visits.

Conflict of interest

The author(s) have declared that there is no conflict of interest.

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Table 1. The Mean Scores of the Patients from the overall HPLP-II and its Subscales

HPLP II Subscales	First Evaluation Mean ± Sd	Second Evaluation Mean ± Sd	Third Evaluation Mean ± Sd	F Value F	p Value p
Interpersonal relations	21.6 ± 5.5	23.9 ± 5.2	26.2 ± 5.0	78.259	0.000
Nutrition	20.4 ± 5.1	22.3 ± 4.9	23.6 ± 4.5	40.583	0.000
Health Responsibility	21.7 ± 4.8	23.6 ± 4.7	25.6 ± 5.1	53.789	0.000
Physical Activity	17.0 ± 5.3	19.1 ± 4.8	20.1 ± 4.7	40.210	0.000
Stress Management	19.0 ± 4.1	21.1 ± 4.4	22.9 ± 4.4	61.183	0.000
Spiritual Growth	24.0 ± 4.5	25.8 ± 5.0	27.8 ± 5.3	55.390	0.000
TOTAL SCORE	123.9 ± 25.2	136.0 ± 25.4	146.5 ± 25.4	89.540	0.000

Table 2. Mean scores of the patients for the subscales of the Illness Perception Questionnaire

Subscales of Illness Perception Questionnaire	First Evaluation Mean ± Sd	Second Evaluation Mean ± Sd	Third Evaluation Mean ± Sd	F F	p P
1. Illness Identity	7.8 ± 3.2	8.3 ± 2.9	8.8 ± 2.9	10.041	0.000
2. Attributions consenting the disease					
Timeline (acute / chronic)	18.5± 3.0	18.2± 2.8	17.9±2.8	3.644	0.028
Consequences	18.6 ±3.3	18.7±3.5	19.8±3.9	8.962	0.000
Personal control	18.8± 3.0	19.4±3.2	20.0±3.6	6.900	0.001
Treatment control	16.0±2.9	16.4±3.0	17.2±3.1	9.604	0.000
Understanding of illness	15.8±3.3	17.1±3.2	16.9±3.4	11.148	0.000
Timeline (cyclical)	11.6± 3.0	12.0±2.8	13.3±2.9	23.536	0.000
Emotional representations	18.2±3.3	15.7±3.9	18.9±3.5	29.612	0.000
3. Disease Causes					
Psychological References	19.3±4.6	19.7± 4.9	21.6 ± 5.2	27.182	0.000
Risk factors	21.1±4.1	21.5± 3.7	23.3 ± 4.3	21.961	0.000
Immunity	8.8 ± 2.5	9.0 ± 2.4	9.6 ± 2.1	9.586	0.000
Accident or Bad Luck	4.5 ± 1.9	4.8 ± 1.8	4.8 ± 1.9	2.696	0.070

Table 3. The patients' Mean Scores of Health Promoting Lifestyle Profile-II within the First Three Months After IM Based on their Socio-Demographic Characteristics

Socio-Dem. Characteristics	HPLP II ToS1	HPLP II ToS2	HPLP II ToS3	p
Gender				
Female	120.0±25.2	132.4±26.5	144.3±23.4	0.000
Male	126.1±25.1	138.0±24.8	147.8±26.5	0.000
	p=0.219	p=0.265	p=0.491	
Age				
50 years of age and younger	123.8±26.3	141.1±25.9	151.4±26.8	0.000
50 years of age and over	123.9±24.7	132.7±24.8	143.4±24.0	0.000
	p=0.984	p=0.086	p=0.101	
Marital Status				
Married	121.7±25.2	135.2±23.7	147.5±24.2	0.000
Widow or Single	135.5±22.5	139.8±33.6	141.5±31.2	0.000
	p=0.033	p=0.486	p=0.362	
Smoking status				
Yes	124.0±27.5	136.1±27.6	145.5±27.5	0.000
No	125.4±23.5	136.5±25.5	146.9±25.7	0.000
Quit	118.0±28.9	133.9±23.6	146.5±22.0	0.000
	p=0.539	p=0.930	p=0.976	
Educational Level				
Illiterate/Literate	116.5±25,0	128.5±26.8	138.3±25.2	0.000
Primary and Secondary School				
High School and higher	122.8±25,8	132.7±24.2	143.6±25.0	0.000
	134.9±21.3	149.8±19.7	160.8±20.1	0.000
	p=0.007	**p=0.001**	**p=0.000**	
Working Status				
Employed	125.5±24.9	139.3±23,.2	151.1±24.9	0.000
Unemployed	121.6±25.7	131.3±28.0	140.0±24.9	0.000
	p=0.429	p=0.104	**p=0.023**	

Table 4. The Mean Scores of the Patients for the Illness Identity Subscale of Illness Perception Questionnaire in the First Three Months

Socio-Dem. Data	Illness Identity 1	Illness Identity 2	Illness Identity 3	p Value
Gender				
Female	7.8±3.5	8.8±2.9	9.3±2.6	**0.001**
Male	7.8±3.0	8.0±2.9	8.4±3.0	**0.031**
	p=0.988	p=0.193	p=0.124	
Age				
50 years of age and younger	8.0±3.0	8.8±2.7	9.2±2.6	**0.008**
Above 50 years of age	7.7±3.3	8.0±3.0	8.5±3.1	**0.009**
	p=0.586	p=0.178	p=0.221	
Marital status				
Married	8.0±3.2	8.5±3.0	8.9±3.0	**0.001**
Single or Widow	6.8±3.1	7.4±2.4	8.2±2.7	0.136
	p=0.152	p=0.159	p=0.352	
Smoking Status				
Yes	8.5±2.3	8.2±3.2	8.4±3.0	0.630
No	7.6±3.2	8.5±2.7	9.0±2.6	**0.000**
Quit	7.8±3.9	7.9±3.5	8.2±3.8	0.412
	p=0.512	p=0.755	p=0.472	
Educational Background				
Illiterate/Literate	7.5±3.6	8.3±3.2	8.9±3.0	**0.013**
Primary and Secondary School	8.1±3.1	8.1±2.9	8.5±2.9	0.077
High School and Higher	8.0±2.6	8.5±2.5	8.9±2.9	**0.007**
	p=0.641	p=0.869	p=0.792	
Working Status				
Employed	7.8±3.1	8.2±3.0	8.6±3.0	**0.006**
Unemployed	7.8±3.3	8.5±2.9	9.0±2.8	**0.011**
	p=0.984	p=0.607	p=0.471	

Table 5- The Correlation Between Health Promoting Lifestyle Profile Total Score, Illness Perception Questionnaire

Variables	HPLP-II 1		HPLP-II 2		HPLP-II 3	
	r	p	r	p	r	p
Illness Identity 1	-0.366	**0.000**				
Illness Identity 2			-0.095	0.318		
Illness Identity 3					-0.085	0.287
Causes Of Disease Total 1	0.418	**0.000**				
Causes Of Disease Total 2			0.511	0.000		
Causes Of Disease Total 3					-0.099	0.301
Attributions consenting the disease Total 1	0.395	**0.000**				
Attributions consenting the disease Total 2			0.424	**0.000**		
Attributions consenting the disease Total 3					0.367	**0.000**