




The Impact of Protection Motivation Theory on the Self-Care of Patients with Myocardial Infarction

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Quantitative Study

Abstract

Background: Self-care is becoming increasingly popular due to rising medical costs, isolation from family, and rising hospital infections. Therefore, the current research aimed to investigate the impact of psychological intervention training based on the protection motivation theory (PMT) on the self-care of patients with myocardial infarction (MI).

Methods: The current study utilized both qualitative and quantitative approaches. The quantitative section was quasi-experimental, with pre-test and post-test design and control group. In 2021, 106 patients with MI were selected for statistical analysis at Ibn Al-Bitar Specialized Hospital for Cardiac Surgery in Baghdad, Iraq. Using SPSS software, the Shapiro-Wilk test was used to examine the normality of the distribution of the variables, Levene's test was utilized to investigate the equality of variances, and analysis of covariance (ANCOVA) was utilized to evaluate the study.

Results: The results of a one-way ANCOVA indicated that the subscales, including proper diet ($F = 42.53, P < 0.001$), non-smoking ($F = 7.81, P < 0.001$), physical activity ($F = 55.96, P < 0.001$), adherence to prescribed medication regimen ($F = 91.65, P < 0.001$), and adjusting the effect of stressful variables ($F = 27.74, P < 0.001$) improved significantly.

Conclusion: PMT, by improving various aspects and subscales of self-care in patients with MI, can be used as an effective educational intervention to help improve these patients' lifestyles and return them as quickly as possible to normal life.

Keywords: Myocardial infarction; Self-care; Psychological intervention

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Introduction

In various societies, heart diseases account for most of the deaths. In recent years, psycho-cardiology has risen to become one of the most significant issues in the field of medicine. Myocardial infarction (MI) is caused by necrosis or death of heart cells (Moshki, Mohammadipour, Gholami, Heydari, & Bayat, 2022). This cell death is caused by a sudden reduction or complete obstruction of blood flow in the coronary arteries to the myocardium (Safari & Monajjem, 2019). When a coronary artery is constricted or obstructed, the region of the heart muscle supplied by that artery develops ischemia and inflammation. Cardiovascular diseases (CVDs) are progressive, chronic conditions that lead to disability and premature death (Momeni, Omid, Raygan, & Akbari, 2018). Forty to fifty percent of the population is affected by the CVD; half of these cases are unidentified and diagnosed late. Although CVD is incurable, it is still manageable (Shi, Ghisi, Hyun, Zhang, & Gallagher, 2021). Consequently, this disease will have significant societal effects on the individual's physical, mental, and social levels, economic costs, social roles, labor supply, etc. (Chang, Wang, Hsu, Tsai, Chan, & Chen, 2020).

MI disease is the result of several risk factors converging. Age and male gender are irremediable risk factors. Blood pressure, diabetes, fats, obesity, social isolation, low social support, insufficient physical activity, an unhealthy diet, alcohol abuse, and smoking are modifiable risk factors for this disease (Deek, Nouredine, Allam, Newton, & Davidson, 2021). Research confirms that risk factors for MI disease fall into three biological, psychological, and social categories, each contributing to the disease onset, development, and maintenance (Dellafiore, Arrigoni, Pittella, Conte, Magon, & Caruso, 2018). As a predictive factor, psychological factors can influence MI disease in two ways. The first route is direct and involves physical responses, whereas the second route is indirect and involves health-related behaviors (Hosseini, Shojaeizadeh, Sanagu, Vakili, Mirkarimi, Jahanshahi, 2017).

Heart diseases impact not only the patient's comfort and happiness but also his or her social relationships, way of life, occupation, and income level. After the diagnosis of a heart attack and the disease progression to an asymptomatic state, it appears necessary to implement an active rehabilitation program to enhance the care behaviors of these patients (Bukhsh, Nawaz, Ahmed, & Khan, 2018). One of these patients' fundamental needs is education, and one of the major essential responsibilities of those in health-related professions is to provide complete and sufficient information (Kim, Hwang, Shin, & Lim, 2021). Enhancing people's awareness and comprehension of risk factors and preventive training behaviors can enhance patients' self-care and prevent their readmission to the hospital. Self-care is essential to raise awareness, assist patients in gaining independence, and facilitate their adaptation to their illness, improving their quality of life (Garcimartin et al., 2022). Teaching these patients can have numerous effects on the health of the individual and the community as a whole (Wang, Chang, & Han, 2021; Yahaya, Abdullah, Ramoo, Zainal, Wong, & Danaee, 2022).

Researches show that changing one's lifestyle by eating a healthier diet and increasing physical activity can help prevent heart disease (Hwang, Pelter, Moser, & Dracup, 2020). The protection motivation theory (PMT) is one of the theories that focus on the factors which impact a person's protective motivation and behavior (Khaledi, Mostafavi, Eslami, Rooh, Mostafavi, & Akbar, 2015). According to this theory, a person is likelier to engage in MI prevention behaviors if he believes he is vulnerable to the

disease (perceived susceptibility) and the disease is severe and dangerous (perceived severity). Furthermore, the individual believes that the adaptive response can eliminate the risk of disease if the intrinsic (perceived reward) and extrinsic rewards of risk-increasing behaviors are less (perceived response efficacy). Furthermore, the person should estimate a lower cost associated with executing the protective behavior (perceived costs) and believe in the capability to perform the protective behavior (perceived self-efficacy) successfully, eventually leading to MI disease prevention behavior (Barnason et al., 2017; Foroozanfar & Ansari-Shahidi, 2020).

In order to plan effective educational programs, it is necessary to assess people's awareness and motivation about preventive behaviors. The growing prevalence of heart diseases, including MI, emphasizes the importance of a multidisciplinary approach to the field. Therefore, the current study was designed to examine the impact of the PMT on the self-care of patients with MI.

Methods

The current study utilized both qualitative and quantitative methods. The qualitative method of PMT was used to conduct the initial phase of the research. The quantitative section was quasi-experimental, with a pre-test, post-test, and control group. In 2021, 381 patients with MI were referred to Ibn Al-Bitar Specialized Hospital for Cardiac Surgery in Baghdad, Iraq, for statistical analysis. As a statistical sample, 106 individuals were selected via simple random sampling method. The individuals mentioned above were divided into intervention and control groups (53 people in each group). Inclusion criteria for the study were confirmation of MI by a specialist physician, age over 40, minimal reading and writing skills, and a willingness to participate. Exclusion criteria included absence from more than two sessions and refusal to complete the questionnaire. Before beginning the research, the participants were given a thorough explanation of the objectives and methodology. Following ethical considerations, the individuals were assured that their identities would remain confidential and that they could leave the study at any time and on their own accord. The Ethics Committee of the College of Medicine at the University of Baghdad approved the present study.

The PMT was presented to the intervention group in nine 60-minute sessions (one session per week). Table 1 describes educational intervention sessions. In contrast, the control group did not obtain the interventions mentioned during the current study. After the study and following the conclusion of the post-test phase, the control group also received intervention training. It is important to note that for the design of the training package of the PMT, reputable scientific sources and the perspective of the medical personnel involved with patients with MI were utilized. Before and after the education in the intervention group, pre-test and post-test phases were conducted.

The self-care questionnaire (Miller et al., 2017) was used to collect data for the current study. This questionnaire consists of 20 items, measuring four questions for each area: proper diet, non-smoking, physical activity, adherence to prescribed medication regimen, and adjusting the effect of stressful variables. This questionnaire is scored using a five-point Likert scale ranging from low probability to high probability. The minimum possible score on the questionnaire is 20, and the maximum score is 100. Patients with higher scores engage in more self-care behaviors. The content validity and overall reliability of this questionnaire were calculated to be 0.84 and 0.91, respectively, in the present study.

Table 1. Description of protection motivation theory (PMT) intervention sessions for patients with myocardial infarction (MI)

Session	Description of sessions
1	Speech for introducing and teaching patients about different types of heart disease, including the structure and function of the heart and the right way to take medicine
2	Using educational slides to teach self-care skills and provide information for more significant impact and retention
3	Examining the needs of patients, and preparing suitable relaxation exercises are also utilized (mental command, will and suggestion, and feeling relaxed)
4	In order to increase the persuasive power of the message, supportive motivational theories are used to create the attraction of fear and alter the audience's attitude
5	Assessing the goals of the previous meeting and creating the belief in the possibility of danger to impact the audience's behavior
6	Increasing awareness through the peer-making method, so that people can gain the necessary conviction regarding their efficacy by observing and comparing their peer group
7	Measuring the goals of the previous meeting by determining the effectiveness of the recommendations and gaining the audience's acceptance of their implementation to generate the required behavior change to mitigate risk
8	Playing the symbolic model training video and repeatedly viewing a movie scene with the theme of overcoming the disease will aid in comprehending the various facets of a person's behavior with the disease
9	Comparing and conducting motivational interviews

In addition, the reliability of the questionnaire subscales, as measured by Cronbach's alpha coefficient, in the areas of proper diet, non-smoking, physical activity, adherence to prescribed medication regimen, and adjusting the effect of stressful variables after hospital discharge were calculated at 0.90, 0.93, 0.85, 0.89, and 0.86, respectively.

The current study used descriptive and inferential statistics at two levels to analyze the data. In descriptive statistics, the mean and standard deviation (SD) were employed. At the level of inferential statistics, the Shapiro-Wilk test was utilized to examine the normality of the distribution of the variables, Levene's test was utilized to investigate the coequality of variances, and the analysis of covariance (ANCOVA) was utilized to examine the study hypothesis. The findings were evaluated by SPSS software (version 19, SPSS Inc., Chicago, IL, USA). It was determined that the significance level of the results was equal to 0.05.

Results

Table 2 displays the results of the demographic variables of the study participants.

Table 2. Comparing the demographic characteristics of two groups

Variable		Intervention group	Control group	P-value
		[n (%)]	[n (%)]	
Gender	Men	34 (64.2)	32 (60.4)	0.41
	Women	19 (35.8)	21 (39.6)	
Age (year)	< 50	14 (26.4)	11 (20.8)	0.12
	50-60	22 (41.5)	24 (45.3)	
	> 60	17 (32.1)	18 (33.9)	
Education	Illiterate	6 (11.3)	8 (15.1)	0.56
	Secondary	33 (62.3)	34 (64.1)	
	College	14 (26.4)	11 (20.8)	
Job	Employed	24 (45.3)	26 (49.1)	0.48
	Unemployed	29 (54.7)	27 (50.9)	
Smoking	Yes	18 (34.0)	21 (39.6)	0.09
	No	35 (66.0)	32 (60.4)	

Table 3. Mean and standard deviation (SD) for self-care subscales in both groups

Variable	Group	Pre-test (mean \pm SD)	Post-test (mean \pm SD)
Proper diet	Intervention	11.76 \pm 2.37	14.61 \pm 3.26
	Control	12.18 \pm 2.49	11.94 \pm 2.44
Non-smoking	Intervention	11.73 \pm 2.62	14.38 \pm 3.29
	Control	11.54 \pm 2.48	11.89 \pm 2.74
Physical activity	Intervention	8.36 \pm 1.72	11.16 \pm 2.27
	Control	8.23 \pm 1.58	8.49 \pm 1.67
Adherence to prescribed medication regimen	Intervention	11.23 \pm 2.71	13.37 \pm 3.62
	Control	11.39 \pm 2.57	11.44 \pm 2.65
Adjusting the effect of stressful variables	Intervention	11.16 \pm 2.36	13.18 \pm 3.19
	Control	11.27 \pm 2.46	11.34 \pm 2.38

SD: Standard deviation

According to table 2, 66 (62.3% of all participants) were men, and 40 (37.7%) were women. Most people were between 50 and 60 years old (43.4%). In the intervention group, the mean age was 53.78 \pm 6.84 years, while in the control group, it was 56.17 \pm 7.62 years. On the other hand, most study participants had secondary education (63.2%). In addition, most people were unemployed (52.8%) and non-smokers (63.2%). Moreover, the results indicated that there was no statistically significant difference in the demographic variables by the both groups ($P > 0.05$). Table 3 presents the mean and SD of self-care subscales separately for both groups at the pre- and post-test stages.

According to table 3, the educational intervention increased the value of self-care subscales in the intervention group. In contrast, the value of subscales in the control group did not change by stages preceding and following the test. Therefore, the PMT improved MI patients' value of self-care. Table 4 displays the ANCOVA results to determine the impact of the PMT intervention on the affected patients' self-care.

According to table 4, the presentation of the independent variable (intervention) could produce a significant difference in the post-test mean value of the dependent variable of self-care between patients with MI. The intervention had a 0.63 effect size on the self-care of patients with MI. To evaluate the variance homogeneity, Levene's test was applied. The post-test results for the self-care variable showed that the variance homogeneity was maintained ($P > 0.05$). The Box's M test for investigating the homogeneity of the matrices revealed that the default of the matrices was also determinate in the post-test phase ($P > 0.05$). In addition, the results of the Shapiro-Wilk test indicated that the normality of the sample distribution of the data for the self-care variable in the pre- and post-test phases of both groups was supported ($P > 0.05$). The multivariate ANCOVA (MANCOVA) outcomes are shown in table 5.

According to the significance of MANCOVA in table 5, it was concluded that, as a finding of the intervention of the PMT, there should be a significant difference in at least one of the subscales between the both groups. In order to examine this significance, a one-way ANCOVA must be conducted (Table 6).

Table 4. Analysis of covariance (ANCOVA) results investigating the impact of intervention on patients' self-care

Source of variation	SS	Df	MS	F	P-value
Pre-test	327.82	1	327.82	15.99	< 0.001
Dependent variable	2916.43	1	2916.43	142.33	< 0.001
Error	1659.72	81	20.49		
Total	2546.57	84			

SS: Sum of squares; df: Degree of freedom; MS: Mean square

Table 5. Multivariate analysis of covariance (MANCOVA) results examining the impact of intervention on patients' self-care

Variable	Value	F	df hypothesis	df error	P-value
Pillai's trace	0.84	28.72	5	41	< 0.001
Wilks' lambda	0.17	28.72	5	41	
Hotelling's t-squared	8.34	28.72	5	41	
Roy's largest root	3.61	28.72	5	41	

df: Degree of freedom

According to table 6, presenting the independent variable (intervention) produced a significant difference for the desired variables (self-care subscales) among patients with MI after the intervention, at a significance level of 0.05. Therefore, controlling the intervening variable (pre-test), the intervention significantly increased the mean values of the desired subscales among patients with MI ($P < 0.001$). The impact of the PMT-based intervention on proper diet, non-smoking, physical activity, adherence to prescribed medication regimen, and adjusting the effect of stressful variables was 0.42, 0.48, 0.32, 0.57, and 0.39, respectively.

Discussion

The current research aimed to investigate the impact of the PMT on self-care of patients with MI. The findings showed that the PMT was effective on the self-care subscales of these patients; consequently, this intervention increased self-care. The present research is consistent with the findings of other studies in this field (Ozoemena et al., 2019; Michalski, Kasprzak, Siedlaczek, & Kubica, 2020). Several studies have demonstrated that the PMT could improve patients' health-related behaviors and self-care (Gallagher, Roach, Belshaw, Kirkness, Sadler, & Warrington, 2013).

In justifying and explaining the role of psychosocial factors in unhealthy behaviors, research demonstrates that individuals with low protective motivational states frequently consume low-nutritional-value foods and tend to smoke more (Ebrahimi, Abbasi, Bagheri, Basirinezhad, Shakeri, & Mohammadpourhodki, 2012; Sun, Jiang, Chen, Li, Xing, & Wang, 2017). Lower levels of protection motivation in men and women were associated with a high-fat diet, less physical activity, increased smoking, and decreased self-care (Mohammadpour, Rahmati, Khosravan, Alami, & Akhond, 2015). These results indicate that unhealthy behaviors may moderate the association between motivation and certain diseases, such as MI. Besides, studies have shown that protection motivation and health-related behaviors, such as healthy eating and exercise, are related and people use these behaviors to cope with and effectively manage the disease (Baker et al., 2011; Jaarsma, Halfens, Tan, Abu-Saad, Dracup, & Diederiks, 2000). It can be concluded that protection motivation directly correlates with a poorer quality of life among patients with MI.

Table 6. Results of a one-way analysis of covariance (ANCOVA) to examine the effectiveness of intervention on patients' self-care subscales

Source of variation	Variable	SS	df	MS	F	P-value
Dependent variable	Proper diet	136.54	1	136.54	42.53	< 0.001
	Non-smoking	38.12	1	38.12	7.81	< 0.001
	Physical activity	143.26	1	143.26	55.96	< 0.001
	Adherence to prescribed medication regimen	163.15	1	163.15	91.65	< 0.001
Adjusting the effect of stressful variables		121.78	1	121.78	27.74	< 0.001

SS: Sum of squares; df: Degree of freedom; MS: Mean square

In explaining the results of the present study, it is essential to note that, according to the PMT, a person assumes responsibility for protective behaviors to receive prompt definitive treatment (Kim et al., 2021). The threat evaluation procedure begins when an individual must identify the threat prior evaluating coping strategies. Perceived threat intensity is an individual's estimation of the severity of the threat. A person weighs against the difficulties of the treatment process when making a decision (Dellafiore et al., 2018).

It should be noted that the PMT provides a crucial cognitive explanation for patients' protective behaviors. In light of this (Arredondo Holguín, Rodríguez Gazquez, & Higuera Urrego, 2012; Howie-Esquivel, Bibbins-Domingo, Clark, Evangelista, & Dracup, 2014). The motivation-based PMT evaluates threats via perceived vulnerability constructs. Moreover, patients with MI can learn a variety of preventive and protective behaviors; additionally, by employing them, their adaptability skills will be enhanced.

The current study's limitations were the limited scope of the research to patients with MI referred to a medical center in Baghdad, some uncontrolled variables such as the patient's socioeconomic status, and the lack of a follow-up phase. As a result, future studies including socioeconomic status and the implementation of the follow-up stage are suggested. Considering the efficacy of the intervention based on the theory of motivation in protecting the self-care of patients with MI, it is suggested that this educational intervention be presented to hospital counselors and clinical psychologists during a specialized workshop. As a result, they can take a practical step toward improving patient's self-care by employing this educational model.

Conclusion

According to the current study's findings on the impact of the PMT on the self-care of patients with MI, this intervention focuses on teaching proper behaviors. The results show that the mentioned theory can be used as an effective intervention to help patients with MI improve their self-care. Furthermore, the PMT improves various aspects and subscales of self-care in patients with MI. Therefore, it is recommended that those involved in treatment utilize self-care training regarding the lifestyle of these patients after the disease as much as possible and return them to normal life as quickly as possible.

Conflict of Interests

Authors have no conflict of interests.

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