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Is Beliefs About Medication a Factor in Adherence to the Medicine in Patients Undergoing Coronary Angioplasty?

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Abstract

Objectives: There are some side effects such as the restenosis of the coronary artery resulted from the failure to follow the medication regimen. Considering that patients' beliefs have a great role in their lifestyle, this study aimed at investigating the relationship between beliefs in medication and self-reported medication adherence in patients with coronary angioplasty (CA).

Materials and Methods: This was a descriptive cross-sectional correlational study. Based on the inclusion criteria, qualified participants were chosen from among the patients who referred to heart specialty hospital using a convenience sampling method. The applied questionnaire in this study included three sections encompassing the demographic information, a 5-item Medication Adherence Questionnaire (MARS), and BMQ-S questionnaire containing two aspects of 'necessity' and 'concerns about taking medications'.

Results: The mean of participants' age was 56.99 (SD=12.80) and the majority of the participants were males (78.7%), married (89.3%), and mostly illiterate (30.7%). The study results showed that 70% (n=105) of the participants had a weak medication adherence. The results of the Pearson correlation demonstrated a statistically significant relationship between the beliefs in medication and adherence to it.

Conclusions: After CA, nurses and family members can pave the way for the patients to adhere to medication by influencing their beliefs.

Keywords: Belief in medication, Medication adherence, Coronary angioplasty

Introduction

In most patients with artery coronary disease, the medication and lifestyle reformation for controlling their conditions might be inadequate. Consequently, coronary angioplasty (CA) is used as a common and low-risk method for restoring the blood flow to the coronary arteries (1).

However, despite the efficiency of angioplasty, unfortunately, restenosis in treated vessels is among the concerns that might have some outcomes such as a need for bypass surgery, myocardial infarction, or death (2). Accordingly, medication adherence is one of the effective steps in preventing such side effects and reducing the speed of restenosis in atherosclerosis vessels. Several clinical trials have shown the effective role of different medications in the secondary prevention of this disease (3-5).

Despite the positive effect of these medications in secondary prevention from artery coronary, medication nonadherence has remained as one of the challenges of the healthcare system in treating the patients after the discharge (6). Nonadherence to or noncompliance with medication is defined as either failure to take the medication or follow the prescribed medication regimen in terms of the accurate dosage and time (7).

Several studies indicated a low rate of medication compliance in patients with heart diseases (8,9). Meanwhile, several studies reported a significant relationship between medication nonadherence and negative outcomes such as infraction for the second time, early death due to the heart attack, and the low quality of life. More precisely, disease recurrence and death, failure to control the disease, as well as rehospitalization and extra expenses imposed upon the patient and healthcare system result from medication nonadherence (6,10,11).

During hospitalization, observing the issues related to the medication, care, and treatment is almost satisfying due to the presence of the physician and nurses and their recommendations (6,11). However, after discharge, patients' adherence to the medication might be affected by the disease type, personal and psychological traits, lifestyle, and some other demographic factors (12).

Despite numerous studies regarding investigating the factors affecting medication adherence and improving the strategies for medication compliance, there remains

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a gap in providing standard, reliable, and assured techniques that guarantee patients' medication adherence (13). One reason for the restricted effectiveness of these interventions might be the existence of complicated and multidimensional factors, along with the effect of their plurality on this phenomenon (14).

Several studies have represented that patients' beliefs might be an obstacle to medication adherence. In other words, they evaluate the advantages and disadvantages of medicine and make a decision based on their own judgment considering the effectiveness, safety, and the value of the medicine (15). Therefore, it might be possible to obtain a broader insight into those factors through identifying the patients' beliefs about medication and utilize it for better management of heart diseases. Nonetheless, few studies have focused on the relationship between patients' beliefs in medication and medication adherence (16).

Improving patients' cooperation and participation in controlling and managing their diseases is one of the important nursing interventions in providing care for patients with chronic and life-threatening diseases (17). Therefore, having knowledge about patients' beliefs in medication and their strategies for controlling and managing the disease, medicines, and their side effects, it becomes possible to provide the required fundamental information for designing effective interventions in order to facilitate the patients' compliance, prevent side effects, and promote their life quality. Accordingly, this study sought to identify the relationship between beliefs in medication and medication adherence in patients after coronary artery angioplasty.

Materials and Methods

Study Design

The present cross-sectional correlational-descriptive study was carried out from May to July 2018. A total number of 150 patients referring to the heart specialty clinic of Tabriz University of Medical Sciences after coronary artery angioplasty participated in this study. First, the permission to conduct the research was obtained from the Vice-chancellor for Research at Tabriz University of Medical Sciences. Then, the subjects were selected from among qualified participants through a non-probability convenience sampling method. The study purpose was explained to the patients before completing the questionnaire. Next, the participants filled in the questionnaires if they desired to participate in the study. The inclusion criteria were being 18 or older, suffering from a coronary artery angioplasty for at least 6 months, having the ability to independently take the medicines at home, and receiving at least one antiplatelet agent, and finally, giving consent to the study. Patients with a diagnosis of a psychiatric disorder and those who were staying in a nursing home or a care center were excluded from the study.

For illiterate participants, the researcher explained the consent form and caregiver read it for them and then the participants signed the forms using their fingerprints although 6 participants rejected to participate in this study. Eventually, data collection was performed through a self-administered questionnaire.

Study Instruments

The study instrument was a questionnaire including 3 parts as follows.

1. The demographic and disease questionnaire included questions about gender, age, marital status, education, income, history of hospitalization for the current disease, and history of coronary artery bypass graft surgery, diabetes, or blood pressure, and the number and type of medications.

2. The Belief in Medication Questionnaire (the BMQ-specific) was used to assess the beliefs in medication (18). This self-reported instrument was used to identify the cognitive perceptions of the patients about their prescribed medicines for a specific health problem (18). The reliability and validity of this scale were tested in a variety of health conditions (19,20). Further, the questionnaire was translated into Persian and its internal reliability was approved in Iran with the reported Cronbach's alpha of 0.71 (21). The Persian version of the BMQ scale was completed via the translation and back translation process. The BMQ-specific encompassed two subscales and each subscale contained five questions. The first subscale assessed the patient's beliefs regarding the necessity and importance of their medication and the second subscale evaluated their concerns about the potential harms and adverse effects of their medication. Each item was scored on a 5-point Likert-type scale with response options ranging from "definitely disagree (1)" to "definitely agree (5)". The total scores for both (necessity and concerns) subscales were calculated by summing up item scores with the total score for each subscale ranging between 5 and 25 and higher scores represented higher beliefs in the necessity of medications and greater concern about the adverse effects of medications. A cutoff point of 13 in the total score for both necessity and concern subscales was considered as having a strong belief and extreme concern, respectively. In other words, it could be mentioned that participants had a high level of belief for medication necessity if the average sum of the five-item medication necessity scale score (with a range of 5-25) was above the midpoint. Otherwise, the participants were considered to have a low level of belief for medication necessity. Similarly, it could be declared that participants had a high level of belief for medication concern if the average sum of the five-item medication concern scale score (with a range of 5-25) was above the midpoint. Otherwise, the participants were assumed to have a low level of belief for medication concerns. Furthermore, the necessity-concern differential was applied to determine the overall patients' beliefs about their medication, in which the patient's belief

was considered positive when the average sum of the 5-item patient's medication necessity scale score exceeded the average 5-item medication concerns scale. Otherwise, it was considered negative (20,22,23).

Based on previous studies, the middle point of this scale was used for classifying the groups as 'low and high necessity' as well as 'low and high concerns' (24). Based on this framework, there were four classifications about patients' beliefs in medication, including high necessity and low concerns as 'compliant', high necessity and high concerns as 'hesitant', low necessity and high concerns as 'skeptic', and low necessity and low concerns as 'indifferent' (24).

3. A self-report tool with good psychometric features (25,26), designed by Thompson et al was used for investigating the rate of medication compliance (MARS, Medication Adherence Questionnaire). This questionnaire contained 10 items that were scored as Yes=1 or No=0. The first two phrases and subsequent eight phrases measured unintentional and intentional medication noncompliance, respectively. The scores were ranged between 0 and 10. Patients were compliant if they responded "NO" to questions 1-6 and 9-10 and "YES" to questions 7-8. The higher score indicated patients' better compliance. In this study, there were two groups as 'medication noncompliance' (scores 0-5) and 'medication compliance' (scores 6-10). In a study in Iran, Hedayati et al reported the reliability coefficient obtained from the test-retest as 0.91 (27).

To identify the validity of the questionnaire, it was translated into Persian using the translation and reverse translation method and its accuracy was approved by an English language expert. Then, the face and content validity of its Persian version were confirmed by 10 nursing faculty members. In the current study, the reliability of the BMQ was identified using internal consistency α(=0.68) and MARS tool test-retest (r = 0.89), respectively.

Data Analysis

The frequency and percentage, as well as mean and standard deviation (SD) were applied to analyze descriptive data using SPSS software, version 21. In addition, the data distribution was normal for analyzing inferential statistics and the Pearson correlation coefficient was used in this regard. The significance level was considered as 0.05. Based on a similar study (16) and by considering the type I error (α=0.05) and power of 90%, the sample size was calculated as 132 although this number increased to 150 given the sample attrition.

Results

Participants' demographic information is shown in Table 1. From 150 participants, whose age mean was 65.99 years (12.80), 78.7%, 89.3%, 30.7%, 52%, 41.3%, and 57.3% were males, married, illiterate, city dwellers, self-employed, and lived with their children. Almost half of them (51.4%) had a blood pressure record. However, the majority of them (76.2%) had no history of diabetes (Table 1).

The score range of 'belief in medication' questionnaire (BMQ-S) was 10-50. About 90% of the participants (n = 135) considered it necessary to take the medicines. However, 96% (n = 144) had great concerns about taking medicines. As shown in Figure 1, only 8% of the participants reached the stage of compliance (high necessity-low concerns) while 76.7% of them were hesitant about believing in medication.

The highest mean in the 'belief' questionnaire was obtained from the item *'All medicines are poisons'* with the mean and SD of 4.42 ± 0.68. However, the lowest mean was obtained from the item *'Doctors who spend much time on their patients prescribe fewer medicines'* with a mean and SD of 2.94 ± 0.97 (Table 2).

The score range of the medication compliance questionnaire was 0-10. The results showed that 70% of the patients (n = 105) represented low medication compliance (Table 3). The highest mean in this questionnaire was obtained from the item *'I feel bizarre taking the medicines'* with a mean and SD of 0.99 ± 0.08 while the lowest mean was for the item *'Have you ever forgotten to take your medicines?'* with a mean and SD of 0.28 ± 0.45.

The results of the Pearson correlation coefficient (Table 4) demonstrated that there was a statistically significant relationship between beliefs in medication and medication compliance.

Discussion

Based on the results, 70% of the participants reported noncompliance or low compliance with medication. In a study carried out by Rouhi Balasi et al, the results indicated that compliance with all care advice was not thorough (28). These results are consistent with the findings of the present study. In a study by Sjölander et al, the results showed that only 12.5% of the patients failed to comply with the medication (29). On the other hand, Lemay et al investigated the effectiveness of rehabilitation programs for the patients after angioplasty and found that the rate of compliance with physical activities increased after one

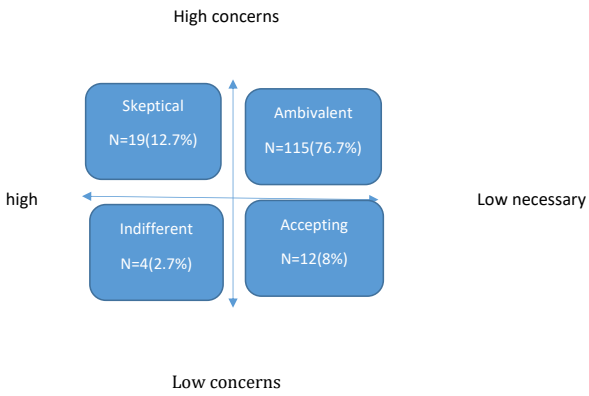

Figure 1. Framework of Patients' Beliefs About Medication.

Table 1. Patient Characteristics by the Adherence Level (n=150)

Characteristics	No.	%	Adherence-adherent No. (%)	Adherent No. (%)	χ^2 (*P* Value)
Gender					
Male	118	78.7	88 (74.6)	30 (25.4)	χ^2=5.519 *P*=0.190
Female	32	21.3	17 (53.1)	15 (46.9)	
Age (y)					
<65	110	73.3	75 (68.2)	35 (31.8)	χ^2=0.649 *P*=0.420
≥65	40	26.7	30 (75.0)	10 (25.0)	
Material status					
Single	7	4.7	5 (71.4)	2 (28.6)	χ^2=2.248 *P*=0.522
Married	134	89.3	95 (70.9)	39 (29.1)	
Divorced	4	2.7	3 (75.0)	1 (25.0)	
Widowed	5	3.3	2 (40.0)	3 (60.0)	
Education					
Illiterate	46	30.7	36 (78.3)	10 (21.7)	
High school	34	22.7	23 (67.6)	11 (32.4)	χ^2=3.553 *P*=0.470
Secondary diploma	43	28.7	27 (62.8)	16 (37.2)	
Graduate degree	25	16.7	17 (68.0)	8 (32.0)	
Post graduate degree	2	1.3	1 (50)	1 (50)	
Monthly income					
Income < cost	16	12.1	11(68.8)	5 (31.3)	χ^2=0.498 *P*=0.780
Income = cost	80	60.6	61 (76.3)	19 (23.8)	
Income > cost	36	27.3	26 (72.2)	10 (27.8)	
Residence					
City	78	52	55 (70.5)	23 (29.5)	χ^2=0.20 *P*=0.887
Rural	72	48	50 (69.4)	22 (30.6)	
Diabetes					
Yes	35	23.8	25 (71.4)	10 (28.6)	χ^2=0.41 *P*=0.840
No	112	76.2	78 (69.6)	34 (30.4)	
Hypertension					
Yes	75	51.4	55 (73.3)	20 (26.7)	χ^2=0.576 *P*=0.448
No	71	48.6	48 (67.6)	23 (32.4)	
Past hospitalization					
Yes	50	65.5	25 (50.0)	25 (50)	χ^2=16.411 *P*<0.001
No	95	34.5	78 (82.1)	17 (17.9)	
CABG history					
Yes	15	10	12 (80)	3 (20)	χ^2=0.773 *P*=0.373
No	135	90	93 (68.9)	42 (31.1)	

Note. CABG: Coronary artery bypass graft surgery.

Table 2. Descriptive Statistics Indicating the Medication Belief of Patients Undergoing Angioplasty

	Level Range	
	Low (1-13) No. (%)	High (14-25) No. (%)
Necessity	15 (10)	135 (90.0)
Concern	6 (4)	144 (96.0)

Total number =150

Table 3. Descriptive Statistics Indicating the Medication Adherence of Patients Undergoing Angioplasty

Score	Adherence	No.	%
0-5	Non-adherent	105	70
6-10	Adherent	45	30
0-10	Total	150	100

Table 4. Correlation Between Medication Belief and Adherence Among Patients Undergoing Angioplasty

	Medication Adherence r	*P* Value
Necessary	0.292	0.000
Concern	0.188	0.022
Belief about medication (total)	0. 304	0.000

year following the heart operation (15).

Consequently, one of the discrepancies between the present study and the two above-mentioned studies could be cultural differences between Asian and European people. In other words, a high rate of medication compliance in the study by Sjölander et al could be due to the effect of individuals' attitudes toward the self-report. Moreover, public and media education could have an effect on medication compliance (29).

Therefore, the lack of a responsible healthcare system in our society might be the reason for medication noncompliance in the present study.

Concerning the beliefs in medication in this study, only 8% of the patients reached the stage of compliance and the majority of them were hesitant. Despite believing in the necessity of taking medicines, they were greatly concerned about their consumption. In the study by Park et al, 37% of the patients reached the stage of compliance and approximately 50% of the patients were hesitant (24). According to Sjölander et al, positive beliefs in medication were rare and patients believed that treatments were not usually effective (29). Similarly, the highest score was obtained from the item *'all medicines are poisons'*

in the present study. Therefore, it can be declared that patients' attitudes were identical in these two studies. In a study conducted in 2018 in Oman, religious issues and believing in the role of God's will in the occurrence of the disease were considered as the reasons for medication noncompliance. In addition, this study introduced the necessity of educating patients, as well as the effect of individuals' religious beliefs in medication compliance (30).

In the above-mentioned studies, despite the necessity of taking medicines, patients were hesitant due to their great concerns. These results could be due to the care existed in the healthcare system, the system of educating the patients, medications, and even the subsequent follow-ups. Patients were often concerned about the medication due to the fear of their dependency upon them or the side effects rather than believing in their effectiveness. Consequently, medical staff, especially nurses should be aware of those concerns and assure themselves that they have a good relationship with their patients in order to handle these concerns. On the other hand, they should emphasize the necessity of the medication in the process of improvement.

Accordingly, as a nurse, it is important to share the known side effects of the prescribed medicines with the patients and to provide information about identifying and preventing them, thus increasing patients' trust and decreasing their concerns.

The demographic information such as age and especially educational level had an effect on the patients' cooperation in taking prescribed medicines regardless of the type and severity of the disease (18-20). However, Horne et al introduced patients' beliefs as the strongest predictor of medication adherence (18).

The results of this study revealed that there was a statistically significant relationship between beliefs in medication and medication adherence. Smith et al introduced the beliefs in medication as one of the predictors of cooperation in medication and the ultimate success in treatment (17), which is in agreement with the results of our study.

The results also showed that patients' higher necessity and lower concern result in obtaining higher scores regarding their beliefs in medication and thus more medication adherence. These results are consistent with the study by Park et al (24) and Horne et al (18). Therefore, nurses should take steps to create beliefs in medication in order to provide medication adherence.

Based on the results, most patients were hesitant due to their concerns about the side effects of the medicines that resulted in their low medication adherence. Hence, the nurses should be aware of this issue, make a list of patients' medicines, explain drug interactions, remind them of the higher effectiveness of the medicines compared to their side effects, and be aware of the mental load of taking medicines, thus creating higher medication adherence in patients (18,24,31).

Therefore, regarding the obtained results and in order to increase the patients' positive beliefs and improve their medication adherence, it is suggested to increase the patients' awareness of the nature of the medicines, as well as the necessity of their consumption and effectiveness. As a result, it will be possible to inform them about the necessity of taking medicines and decrease their concerns about the probable side effects. Accordingly, considering the patients as active decisionmakers in their cooperation in taking specific medicines is of great importance. Furthermore, providing the patients with useful advice and enough information about the necessity and effectiveness of the medicines, as well as their conditions in order to promote their belief in medication seems inevitable.

One suggested strategy is to consider social support as an effective factor in patients' beliefs in medication and to utilize supportive systems such as medical staff, family, and friends in order to manage their beliefs. The results of a previous study showed that available social support had a positive effect on the patients' beliefs and their physical and mental health (32).

The results of this study might be used for planning and conducting further interventions in order to decrease patients' concerns and help them comply with medication and improve their adherence to care advice while decreasing the expenses resulted from re-hospitalization in the clinics.

Observing the self-care advice was impossible since it was followed by the subjects at home. In addition, the questionnaire of 'following self-care advice', which was completed based on patients' statements, could influence the study results since it was beyond the control. However, considering the findings of the present study regarding the relationship between following care advice and beliefs in medication, it is suggested that clinical research be conducted in society in order to improve the adherence rate in the mentioned fields.

There are some limitations to fulfill this study. It may not provide sufficient evidence regarding the cause-effect relationship of belief about medication and medication adherence due to the inherent characteristics of the cross-sectional study. Finally, study variables were assessed using self-reported data, which may have underestimated these undesirable activities due to self-reported concerns.

Conflict of Interests

Authors have no conflict of interests.

Ethical Issues

The participants received information about the study and provided written consent. The present study was approved by the Regional Ethics Committee of Tabriz University of Medical Sciences (IR.TBZMED.REC.1397.098).

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