

Effect of Patient-Focused Clinical Pathway on Anxiety, Depression and Satisfaction of Patients With Coronary Artery Disease: A Quasi-Experimental Study

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Background: Coronary artery diseases (CAD) are associated with psychological problems such as anxiety and depression in patients. Thus, management of these problems can consider as an important intervention by health care workers, especially nurses.

Objectives: The purpose of this study was to investigate the effectiveness of patient-focused clinical pathway on anxiety, depression and satisfaction of patients with CAD.

Patients and Methods: In this quasi-experimental study, 138 patients suffering from CAD in a coronary care unit of a referral teaching hospital affiliated to Semnan University of Medical Sciences in Semnan, Iran, were recruited using a convenience sampling method. The participants were assigned to two groups: Clinical pathway (CP) and routine (RUT) care. The level of anxiety and depression of patients were measured in admission and discharge in both groups. Also, the level of patients' satisfaction was measured at the time of discharge. Data were analyzed using descriptive and inferential statistics.

Results: Prevalence rates of anxiety and depression in total of patients were 7.2% and 8.7%, respectively. In terms of anxiety, the mean of difference between pretest and posttest scores in the CP group (0.52 ± 1.39) was higher compared to the RUT group (-0.17 ± 1.69) and there was a significant difference between the two group ($P = 0.009$). In terms of depression, the mean of this difference in the CP group (0.75 ± 2.05) was higher compared to the RUT group (0.00 ± 1.08), as there was a significant difference between the two group ($P = 0.024$). Also, the mean of patients' satisfaction scores in the CP group (3.69 ± 0.39) was higher compared to the RUT group (3.45 ± 0.47) and there was a significant difference between the two groups ($P = 0.002$).

Conclusions: According to the positive effects of CP on patients with CADs, it can be considered as a useful, safe and simple instrument for the improvement of patients' outcomes. Thus, the findings of this study can provide a new insight in patient care for clinical nurses.

Keywords: Coronary Artery Disease; Patient Satisfaction; Anxiety; Depression; Clinical Pathways

1. Background

Coronary Artery Diseases (CADs) are the main causes of death in the world. It has been reported that the CADs have been the most leading cause of death in 2012 (1). In the United States, one of every six death in 2010 has been due to the CADs (2). In developing countries, cardiovascular disease and related life style factors are the main reason of morbidity and mortality (3, 4). Similarly, in Iran, cardiovascular diseases accounted for 45% of causes of death (5).

Life-threatening and devastating nature of CADs is a leading factor of mental health problems in patients (6, 7). In this respect, anxiety and depression are common issues of patients during the process of heart diseases (8, 9). Luttik et al. (10) in a study with 217 patients with CADs reported that 26% and 42% of the patients showed depres-

sion and anxiety symptoms. In Ghaleiha et al.'s study (11), the prevalence of anxiety and depression in 360 Iranian hospitalized patients with heart diseases were reported to be 47.5% and 66.6%, respectively. Similarly in another Iranian study, Beyraghi et al. (12) reported that 90% and 72% of patients with heart diseases had symptoms of anxiety and depression, respectively.

Anxiety and depression in patients with heart diseases are associated with a poor prognosis, and higher morbidity and mortality (13-15). In fact, they affect the physical and psychological well-being of patients and reduce their survival and quality of life (16, 17).

Uncertainty in life situation has been mentioned as one reason of anxiety and depression in patients with the CADs (18). Moreover, encountering with life-threatening

and stressful conditions, enhance patients' anxiety symptoms and establish the feelings of helplessness, self-reproaches, weakness, grave fear and depression in such patients (18, 19). In this regard, knowledge improvement and educational support about the nature of cardiac symptoms have been stated to help patients accept early treatment, and reduce the risk of progression of the CADs (20). Rahmati Najarkolaei et al. (21) suggested improvise educational interventions based on CAD risk factors are the most important and effective strategies in decreasing the morbidity and mortality of high-risk populations. In fact, those patients who do not recognize their cardiac diagnosis might have a higher level of anxiety in comparison to those patients who know about their disease (10). Thus, providing information to patients with the CADs is an important nursing intervention (22).

One of the proposed tools to improve patients outcomes is clinical pathway (CP) that has been introduced since 1985 (23). The CP is a multidisciplinary outline designed to guide how patients can be cared for, when and by whom (24). The CP can define the course of treatment in detailed steps in a plan or inventory of actions (25). It has some advantages such as reducing the variation of care, improving the knowledge of patient and his/her family, increasing understanding of the patient of therapeutic procedures (23). It not only can significantly im-

prove the quality of care and patient's outcomes (26-29), but also has some benefits such as providing routine day-to-day care plans and detailed information on the treatment process (30). Also, the CPs can enhance the patients' knowledge about treatment process (31).

Although the CPs are used as a tool to improve the quality of care in health care management that usually used by health care staff (23); however, no previous study is available to investigate the effectiveness of these tools when using by patients.

2. Objectives

Therefore, this study was conducted to explore the effectiveness of a patient-focused clinical pathway on anxiety, depression and satisfaction of patients with CAD.

3. Patients and Methods

3.1. Design

This quasi-experimental study was performed on 138 patients over the age of 30 years old who were admitted to a coronary care unit (CCU) of a referral teaching hospital (Fatemiyeh's Hospital) affiliated to Semnan University of Medical Sciences in Semnan, Iran. The hospital was governmental with 4 medical wards, CCU, medical intensive care unit (ICU) and hemodialysis unit.

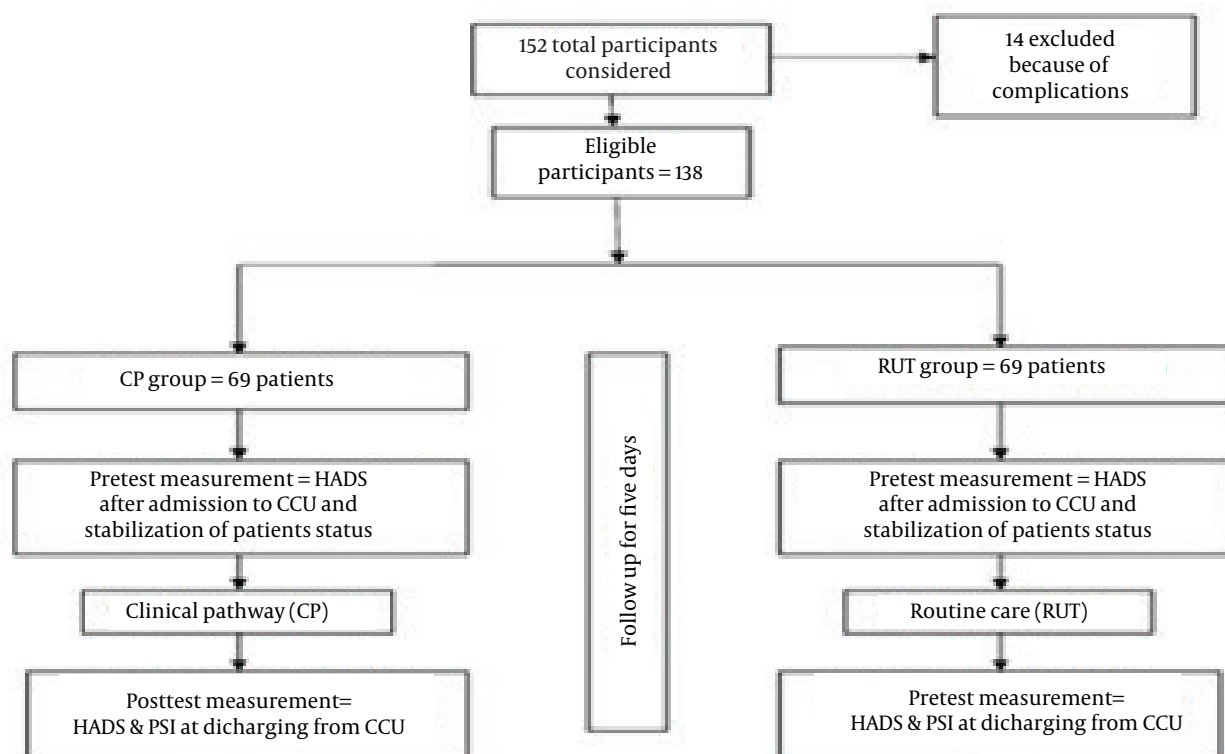


Figure 1. Research Steps

3.2. Participants

The inclusion criteria for patients who admitted to CCU were CAD and having at least literacy to read the clinical pathway. Also, patients with sudden life-threatening conditions, known psychiatric disorders such as chronic anxiety or depression and experiencing the complicated myocardial infarction were excluded. From 152 patients who were admitted with CAD in CCU, 138 patients were enrolled in this study and 14 patients excluded because of complications. The participants were recruited using a convenience sampling method. Then, every patient who had inclusion criteria was recruited and allocated into two groups: CP and Routine (RUT). In order to prevent contamination of the participants, according to environment of the CCU, the total numbers of beds in the CCU (10 beds) were randomly divided into two halves and apart from each other as: 5-beds were considered for the CP group and 5-beds for the RUT group (Figure 1). In this regard, the patients in each group were chosen separately and had no communication with each other throughout the study process.

3.3. Intervention

At first, according to therapeutic and caring protocols of the CCU, a CP was developed with the aim of informing patients with CADs of their treatment process. A multidisciplinary team consisting of a cardiologist, a head nurse of CCU, a dietician, a laboratory and a radiology technician involved in designing this clinical pathway. The CP was designed in such a way that the patients with minimum of reading literacy would be able to read and follow its contents. They could follow their treatment and caring process using the CP and ask questions about caring procedures.

The pathway was consisted of main daily medical and nursing interventions implemented in the CCU for patient with CAD. The CP focused on:

- 1) Patient's activities of daily living (ADL)
- 2) Diagnostic and laboratory tests
- 3) Pharmacologic treatments
- 4) Nutritional plan
- 5) Monitoring and caring procedures
- 6) Medical consultation

Table 1 depicts a summary of the contents of the CP. In the intervention group, the responsible nurse for each patient would record the interventions conducted for the patients. Patients could read their related interventions, as they would be informed of expected actions and protocols of their care process. In the control group, the patients were treated according to routine care protocols of the CCU.

3.4. Data Collection

The levels of patient's anxiety, depression and satisfaction were measured as the study outcomes. To prevent

measurement bias, a non-participant in this study collected data. Anxiety and depression in patients were measured in two stages: after admission to the CCU (pretest) and at the time of discharge from CCU (posttest). Patient's satisfaction was measured only after discharge from CCU (posttest).

In the both groups, after admission to the CCU and becoming ensure of the stabilization of patients' status, the hospital anxiety and depression scale (HADS) was completed for each patient (32). Again, at the time of discharge from the CCU, the level of anxiety and depression of the patients were remeasured using the HADS. The HADS was a Likert scale composed of 14 items (7 for anxiety and 7 for depression) to which patients responded through a 4-point scale (from 0 to 3). The scores of anxiety and depression were calculated separately by sum of the scores in the domain between 0 and 21.

The HADS is a useful and valid instrument to assess patients' anxiety and depression in clinical settings in three categories: 0 - 7 (normal), 8 - 10 (borderline) and 11 - 21 (abnormal). The validity and reliability of HADS was confirmed by multiple studies (15, 32). In this study, the Iranian version of the HADS (33) was used. In addition, the reliability of this scale using the Cronbach's alpha coefficient was estimated to be 0.89.

The patients' satisfaction was measured using the Hinshaw and Atwood's Patients Satisfaction Instrument (PSI) that its validity and reliability was confirmed by several studies (34, 35). The PSI was comprised of 25 items. The dimensions of patient's satisfaction were technical-professional care (7 items), trust (11 items), and patient education (7 items). The instrument measured the patients' view about care using 5-point Likert scale in a range of strongly disagree (score 1) to strongly agree (score 5). In this study, the Persian version of the PSI (36) was completed by patients after discharging from the CCU. Also, the reliability of this scale using the Cronbach's alpha coefficient was reported to be 0.84.

3.5. Sample Size and Data Analysis

Since there was no similar study exactly, a pilot study was conducted to determine the number of sample size. The mean and standard deviation were calculated for anxiety difference scores (in the CP group: 0.65 ± 1.21 and the RUT group: -0.27 ± 1.63), depression difference scores (in the CP group: 0.74 ± 1.67 and the RUT group: -0.06 ± 1.47) and patient's satisfaction scores (in the CP group: 992.5 ± 9.7 and in the RUT group: 86 ± 12). Then according to acquired parameters with a two-tailed α of 0.05 and a $(1-\beta)$ of 0.80, for a comparison of two independent proportions, it was estimated to be 69 patients per each group.

Finally, data analysis was performed using statistical tests such as Kolmogorov-Smirnov, pair and independent sample T-test, Mann-Whitney, chi-square and general linear model: repeated measures analysis at 5% significance level with SPSS version.18 software for Windows.

Table 1. Summarized Clinical Pathway for Patients With Coronary Artery Diseases (CADs) ^a

Medical and Nursing Interventions	Days of Hospitalization in Coronary Care Unit, CCU				
	1	2	3	4	5
Activity status	Complete bed rest (CBR)	CBR	CBR (if Troponin test was positive); CBR (if there is dysrhythmia; relative bed rest (RBR) if Troponin test was negative and there is no dysrhythmia (activity is limited to around the bed and with permission of nurse)	CBR (if suddenly occurs hypotension); RBR (activity is very limited and with permission of nurse)	CBR (if suddenly occurs hypotension), RBR (activity is limited and with permission of nurse)
Laboratory tests	Troponin Complete blood count Blood sugar	Troponin Fasting blood sugar (FBS) Cholesterol Triglyceride	PT & PTT Creatinine	PT & PTT	PT & PTT
Medications	Other	Other	Other	Other	Other
Oral	Aspirine Tranquilizers Captopril Ranitidine Metoral Laxatives Atrostatine	Aspirine Tranquilizers Captopril Ranitidine Metoral Laxatives Atrostatine Nitrocantine (if Troponin test was negative)	Aspirine Tranquilizers Captopril Ranitidine Metoral Laxatives Atrostatine Nitrocantine (if Troponin test was negative)	Aspirine Tranquilizers Captopril Ranitidine Metoral Laxatives Atrostatine Nitrocantine (if troponin test was negative)	Aspirine Tranquilizers Captopril Ranitidine Metoral Laxatives Atrostatine Nitrocantine (if troponin test was negative)
Intravenous	Nitroglycerine Morphin or Petedine Heparin or Anoxaprine Streptokinase if physician recommended Others	Nitroglycerine (if troponin test was positive) Morphin or Petedine (if chest pain is present) Heparin or Anoxaprine Others	Heparin or Anoxaprine Others	Heparin or Anoxaprine Others	Heparin or Anoxaprine Others
Dietary recommendations	Low salt and fat (white meat: chicken or fish) NPO for 6 hours if Stereptokinase administered NPO for 24 hours if there is nausea and vomiting	Low salt and fat (preferably white meat) Low salt and fat and diabetic (if patient had diabetes)	Low salt and fat (preferably white meat) Low salt and fat and diabetic (if patient had diabetes)	Low salt and fat (preferably white meat) Low salt and fat and diabetic (if patient had diabetes)	Low salt and fat (preferably white meat) Low salt and fat and diabetic (if patient had diabetes)
Vital signs monitoring					

Vital signs monitoring per 6 hours (especially blood pressure and heart rate)	Vital signs monitoring per 6 hours	Vital signs monitoring per 6 hours	Vital signs monitoring per 6 hours	Vital signs monitoring per 6 hours
	Blood pressure monitoring if hypotension is present	Blood pressure monitoring if hypotension is present	Blood pressure monitoring if hypotension is present	Blood pressure monitoring if hypotension is present
Medical counseling^d				
Endocrinology (diabetes)	Endocrinology (diabetes)	Endocrinology (diabetes)	Endocrinology (diabetes)	Endocrinology (diabetes)
Renal	Renal	Renal	Renal	Renal
Gastrointestinal	Gastrointestinal	Gastrointestinal	Gastrointestinal	Gastrointestinal
Respiratory	Respiratory	Respiratory	Respiratory	Respiratory
Others	Others	Others	Others	Others
Complementary practice				
Electrocardiogram (EKG) before and after Sterptokinase	Daily ECG before physician visiting	Daily ECG before physician visiting	Daily EKG before physician visiting	Daily ECG before physician visiting
Oxygenation by mask or nasal cannula	□ ECG if there is chest pain	ECG if there is chest pain	ECG if there is chest pain	ECG if there is chest pain
Patient's education and discharge planning^c				
1. Administration of medications at home	1. Administration of medications at home	1. Administration of medications at home	1. Administration of medications at home	1. Administration of medications at home
2. Dietary recommendations	2. Dietary recommendations	2. Dietary recommendations	2. Dietary recommendations	2. Dietary recommendations
3. Follow-up care and time of re-visiting by physician	3. Follow-up care and time of re-visiting by physician	3. Follow-up care and time of re-visiting by physician	3. Follow-up care and time of re-visiting by physician	3. Follow-up care and time of re-visiting by physician
4. Type and level of activities	4. Type and level of activities	4. Type and level of activities	4. Type and level of activities	4. Type and level of activities
5. Stress management actions	5. Stress management actions	5. Stress management actions	5. Stress management actions	5. Stress management actions
6. Avoiding from smoking (if patient is smoker)	6. Avoiding from smoking (if patient is smoker)	6. Avoiding from smoking (if patient is smoker)	6. Avoiding from smoking (if patient is smoker)	6. Avoiding from smoking (if patient is smoker)
7. Insulin injection (if patient has diabetic)	7. Insulin injection (if patient has diabetic)	7. Insulin injection (if patient has diabetic)	7. Insulin injection (if patient has diabetic)	7. Insulin injection (if patient has diabetic)

^a This table was summarized form of CP and was modified for presentation to this manuscript.

^b According to heart physician recommendation.

^c Patient education is focused on patients' questions about treatment process and side effects of medications. Discharge planning is begin gradually and is focused on mentioned items.

3.6. Ethical Consideration

The study was approved by the research ethics boards of Semnan University of Medical Sciences, Semnan, Iran and it was registered in Iranian registry of clinical trials (IRCT ID: IRCT201202235134N5). The objectives of the study were explained in detail to each participant. Information with regard to the voluntary nature of the participation, their right to privacy and anonymity as well as right to withdraw from the study at any time without any penalty were stated to the patients. Finally, the participants signed an informed consent form.

4. Results

4.1. Demographic Data

Most of the patients were male (67.4%). The mean age of the patients was 58.86 ± 10.81 years. Also, the age of 53.6% of the patients was less than 60 years. In terms of educational level, 50.7% of the subjects were less than high school, 35.5% had diploma and 13.8% were over diploma (associate, bachelor's and master's degrees). Fifty percent of them were hospitalized for the first time in the CCU. Also, 83.3% of patients were diagnosed with

unstable angina and 16.7% suffered from myocardial infarction. It was shown that there was no significant difference between the intervention and control groups in terms of participants' characteristics such as gender, age, education level, times of hospitalization in the CCU and sort of the disease ($P > 0.05$) (Table 2).

4.2. Anxiety and Depression Levels

At the admission time, in the CP group, 8.0% and 3.6% of the patients had borderline and abnormal anxiety levels, respectively (5.04 ± 3.49). While in time of discharge from CCU, 8.7% and 0.7% of the cases were in borderline and abnormal anxiety levels, respectively (4.52 ± 3.25). In the RUT group, the range of anxiety among patients was 9.4% (borderline) and 3.6% (abnormal) (4.96 ± 3.45) at the admission time, whilst this range was 8.7% (borderline) and 3.6% (abnormal) in time of discharge from CCU (5.13 ± 3.39).

In term of depression, at the admission time in the CP group 10.1% and 5.8% of the cases had borderline and abnormal depression levels, respectively (5.25 ± 3.95). However, in time of discharge from CCU, range of depression among the CP group patients was 10.1% (borderline) and 0.7% (abnormal) (4.49 ± 3.51). In the RUT group, 10.9% and

2.9% of the cases had borderline and abnormal depression levels, respectively at the admission time (5.43 ± 3.22). While in time of discharge from CCU, 10.1% and 3.6% of the cases were in borderline and abnormal anxiety levels, respectively (5.43 ± 3.09).

4.3. Comparing Outcomes

To compare the anxiety and depression between the CP and RUT groups, the mean of difference between pretest scores with posttest scores in each of them (pretest-posttest) was measured between the groups. In terms of anxiety, this difference was 0.52 ± 1.39 and -0.17 ± 1.69 in the CP and RUT groups, respectively. There was a significant difference between two groups ($P = 0.009$), as anxiety in the CP group was lower compared to the RUT group (Table 3). In terms of depression, this difference was 0.75 ± 2.05 and 0.00 ± 1.08 in the CP and RUT groups, respectively. There were a significant difference between the two groups ($P = 0.024$), as depression in the CP group was lower compared to the RUT group (Table 4).

Also, the repeated measure analysis was used to evaluate the interaction between the groups and repeated in terms of anxiety and depression. In anxiety, the interaction between group and repeated was significant ($F(1,136) = 7.12$, $P = 0.009$). This means that the score of anxiety before

Table 2. Participant Characteristics in Two Groups of Study ^{a,b}

Participant Characteristics	CP Group	RUT Group	P Value ^c
Gender			0.204
Male	43 (62.3)	50 (72.5)	
Female	26 (37.8)	19 (27.5)	
Age, y			0.116
Below 60	41 (29.7)	33 (23.9)	
Above 60	28 (20.3)	36 (26.1)	
Education level			0.167
Cycle	35 (25.4)	35 (25.4)	
Diploma	28 (20.3)	21 (15.2)	
Over diploma (associate, bachelor's and master's degree)	6 (4.3)	13 (9.4)	
Times of hospitalization in CCU			0.644
First	34 (24.6)	35 (25.4)	
Second	18 (13)	22 (15.9)	
Third	6 (4.3)	5 (3.6)	
Fourth	6 (4.3)	2 (1.4)	
Fifth	5 (3.6)	5 (3.6)	
Sort of disease			0.500
Unstable angina	58 (42)	57 (41.3)	
Myocardial infarction	11 (8)	12 (8.7)	

^a Abbreviations: CP, clinical pathway; and RUT, routine.

^b Data are presented as No. (%).

^c Chi-square test.

and after intervention (i.e. in two measurements) was affiliated to the group, which is also seen in Figure 2. Also, the results showed that the mean anxiety score difference before and after the intervention of two groups (0.52 in CP and -0.17 in RUT) had a significant difference ($P = 0.009$).

The patient's satisfaction in the CP group (3.69 ± 0.39) was significantly higher compared to the RUT group (3.45 ± 0.47) in terms of total scores ($P = 0.002$). Also, technical-professional dimension in the CP group (3.80 ± 0.53) was significantly higher ($P = 0.002$) compared to the RUT group (3.51 ± 0.52). Educational dimension was higher ($P = 0.019$)

in the CP group (3.70 ± 0.56) compared to the RUT group (3.45 ± 0.64). In addition, trust dimension had achieved significantly more points in the CP group (3.61 ± 0.36) compared to the RUT group (3.40 ± 0.48) ($P = 0.006$) (Table 5).

In depression, the interaction between group and repeated was significant ($F(1,136) = 5.20, P = 0.024$). This means that the score of anxiety before and after intervention (i.e. in two measurements) was affiliated to the group, which is also seen in Figure 3. Also, the results showed that the mean anxiety score difference before and after the intervention of two groups (0.75 in CP and 0.00 in RUT) had a significant difference ($P = 0.024$).

Table 3. Comparing the Anxiety Scores Between Two Groups of the Study ^{a,b}

Anxiety Scores	CP Group	RUT Group	P Value ^c
Pretest	5.04 ± 3.49	4.96 ± 3.45	0.883
Posttest	4.52 ± 3.25	5.13 ± 3.39	0.284
Difference of pretest and posttest	0.52 ± 1.36	-0.17 ± 1.69	0.009

^a Abbreviations: CP, clinical pathway; and RUT, routine.

^b Data are presented as mean ± SD.

^c Independent t-test.

Table 4. Comparing the Depression Scores Between Two Groups of the Study ^{a,b}

Depression Scores	CP Group	RUT Group	P Value ^c
Pretest	5.25 ± 3.95	5.43 ± 3.22	0.760
Posttest	4.49 ± 3.51	5.43 ± 3.09	0.097
Difference of pretest and posttest	0.75 ± 2.05	0.00 ± 1.83	0.024

^a Abbreviations: CP, clinical pathway; and RUT, routine.

^b Data are presented as mean ± SD.

^c Independent t-test.

Table 5. Comparing the Patients' Satisfaction Between Two Groups of the Study ^a

Dimensions of PSI	CP Group			RUT Group			P Value
	Mean	Median	IQR	Mean	Median	IQR	
Technical-professional	3.80 ± 0.53	3.85	0.71	3.51 ± 0.52	3.57	0.64	0.002 ^b
Educational	3.70 ± 0.56	3.71 ±	0.71	3.45 ± 0.64	3.57	0.86	0.019 ^c
Trust	3.61 ± 0.36	3.63 ±	0.36	3.40 ± 0.48	3.45	0.82	0.006 ^b
Total scores of PSI	3.69 ± 0.39	3.72 ±	0.40	3.45 ± 0.47	3.48	0.66	0.002 ^b

^a Abbreviations: CP, clinical pathway; IQR, interquartile range; and RUT, routine.

^b Independent t-test.

^c Mann-Whitney test.

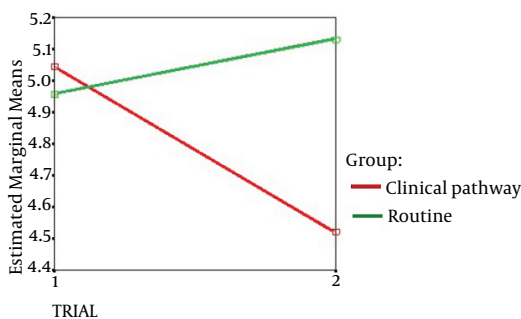


Figure 2. Mean of Anxiety According to the Clinical Pathway and Control Groups in Admission to the (Trial 1) and Time of Discharge From Coronary Care Unit (Trial 2)

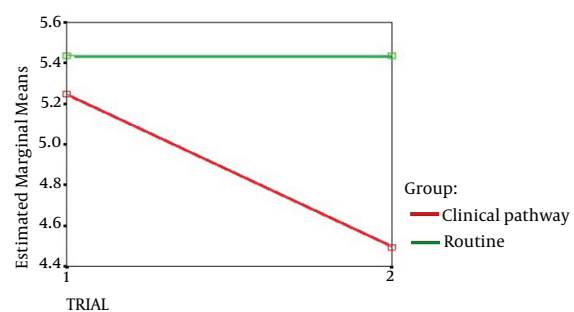


Figure 3. Mean of Depression According to Clinical Pathway and Control Groups in Admission to the (Trial 1) and Time of Discharge From Coronary Care Unit (Trial 2)

5. Discussion

Patients with the CADs encounter with life-threatening conditions. They may experience some psychological problems such as anxiety and depression. Therefore, the management of these problems is important to enhance the patients' health status in the CCU. This study was performed to determine the effect of a patient-focused clinical pathway on the anxiety, depression and patient's satisfaction.

In this study, the prevalence rates of anxiety and depression in total of patients were 7.2% and 8.7%, respectively. In Beyraghi et al. study (12), 90% and 70% of the patients in the CCU were shown symptoms of anxiety and depression, respectively. In DiGiacomo et al.'s study (37), 15.8% and 10.3% of women following acute coronary syndrome had extremely severe anxiety and depression, respectively. Moreover, Arab et al. (38) measured the anxiety and depression of patients after 48 hours of admission in the CCU. Their results showed that the mean scores of anxiety and depression were 10.12 ± 3.49 and 10.10 ± 2.69 , respectively. A significant point in this study is a low level of anxiety and depression in comparison to other studies. In this study, anxiety and depression had been measured after stabilization of patients' status and chest pain relief, that maybe these have been the reason of lower incidence of anxiety and depression in this study.

In this study, the CP helped to reduce the level of anxiety and depression in patients with CADs. Similar to this study, Tastan et al.'s (30) study showed that CP reduced the anxiety scores of patients with breast cancer undergoing breast surgery. Also, in Sulch et al.'s study (39), the care pathway similar to the conventional care decreased the patients' anxiety and depression of patients. Contrary to this study, El Baz et al. (40) not only did not observe any difference between the study groups in terms of depression, but also, found that anxiety scores in the conventional-care group were lower than the CP group, that supports this notion that educating the patients may increase patients' anxiety or depression (41, 42). In our study it seems that the CP was enhanced the patient knowledge of the disease process; so, they already had prepared to face with unexpected actions or interventions. Also, in this study participants' characteristics were similar between the groups and there was no significant difference among patients. Whilst, El Baz et al. (40) concluded that the confounding personal characteristics such as ethnicity, co-morbidity and personality traits must be taken into consideration in designing CP.

Clinical pathway enhanced the patients' satisfaction scores. The effect of CP on patient's satisfaction has been considered in other studies. Graeber et al. (43) concluded that introduction of CP in general surgery patients was improved their satisfaction that was due to a reduced length of hospital stay, number of laboratory tests, number of consultations, and number of imaging procedures. However, in another study with the aim of comparing

quality of life, satisfaction and functional outcomes in patients with fractured neck of femur between the standard care and clinical pathway, the results showed that there was no significant difference between the groups on clinical and functional outcome, quality of life and satisfaction (44). In this study, perhaps reading of CP and acquiring awareness to treatment process had been leading to reduce the patients' concerns about interventions and treatment modes. Therefore, because they could follow their status on CP, they feel more satisfaction.

Most of the CPs were developed for management and quality improvement purposes and the main audience of them has been health-care personnel. However, in this study for the first time a patient-centered CP was designed for patients with the CADs. Although in this study, the patient-centered CP had positive effects on patients' anxiety, depression and satisfaction, but there were some limitations. In this study, although we had tried the patients unaware of each other, it seems that if this study was performed in multiple centers simultaneously, we could get complete results about efficacy of CP. Also, in this study, we cannot control the patient-physician communication. Since sometimes a trustful sense was formed between the physician and patient, this may influence the patient's anxiety. So, further studies are recommended in this area especially in other clinical settings.

According to the positive effects of CP on patients with CADs, it can be considered as a useful, safe and simple instrument for the improvement of patients' outcomes. Thus, the findings of this study can provide a new insight in patient care for clinical nurses. Further studies are suggested to investigate the efficacy of CP on other outcomes such as physiological indices and the quality of life in patients with the CADs.

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Authors' Contributions

Ali Fakhr-Movahedi was involved in study design, managing the data collection and analysis, development of clinical pathway and drafting of the manuscript. Mohsen Soleimani was involved in the supervision, data analysis, development of clinical pathway and drafting of the manuscript. Razeyeh Ghazvininejad was involved in data collection and preparing the data for analysis. Mohammad Kazem Maher was involved in the development of the clinical pathway and study design. Raheb Ghorbani was involved in data analysis and research methodology.

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