# Dreams Content and Emotional Load in Cardiac Rehabilitation Patients and Their Relation to Anxiety and Depression

**Abstract**

**Background:** The assessment of a dream and its mechanisms and functions may help us to percept cognitions, emotions, and complex behaviors of patients. Hence, the present study aimed to assess (i) the rate of perceived dream and its emotional load and content and (ii) the relationship between functions of dream with anxiety and depression. **Methods:** In this cross-sectional study, 167 cardiac patients who had undergone rehabilitation in the western part of Iran were assessed during May–October 2016. Research instrument included Beck depression inventory, Beck anxiety inventory, Schredl's dream emotions manual, and content analysis of dreams manual. The findings were analyzed through Pearson's correlative coefficient and multiple regression analysis. **Results:** The mean age of participants (66.5% men) was 59.1 ± 9 years. The results indicated that the emotional content of patients' dreams included happiness (49.1%), distress (43.1%), sad (13.8%), fear (13.2%), and anger (3%). Although women report more sad dreams than men ($P = 0.026$), there was no difference between them in terms of other components of dreams, anxiety, and depression. Regression models showed that anxiety and depression were significantly able to predict perceived dream rates ($P = 0.030$) and emotionally negative dreams ($P = 0.019$). **Conclusion:** The increased rates of depression, especially anxiety, are related to increasing perceived dreams with negative and harmful emotional load. Regarding severity and negative content of dreams are reflexes of stressful emotional daily experiences, the management of experienced psychological symptoms such as depression and anxiety is concerned as an undeniable necessity.

**Keywords:** *Anxiety, cardiovascular disease, depression, dream, sleep*

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## Introduction

Dream is one of the most unique abnormal states of consciousness, which concludes many functions such as mood regulation, adjustment, and integration of new information with available memory system.[1] The dream is defined as one type of mental activity during sleep.[2] Dreams usually occur during rapid eye movement (REM) phase,[1] so the rate of recall of dream after REM phase is 80% while it is 7% after non-REM sleep.[3]

Based on the recent reports, the assessment of dream and its mechanisms and functions can help percept human's cognitions, emotions, and complex behaviors.[1] Regarding the relationship between the content of dream and cognition and behavior in awaking time,[2,4] a dream may play a role in the explanation of psychopathologies of many psychiatric disorders and etiology of neurologic disorders.[1,3] Recalling dream and time duration and its content can be

a reflex of the developmental process of a psychological pathology of psychiatric disorders or other chronic diseases.[3]

In this regard, some studies indicated that there is a relationship between the content of a dream and psychological components such as mood disorders such as depression,[3] anxiety disorders such as posttraumatic stress disorder,[5] and alexithymia[6] among general and clinical populations. These findings suggest that the content of dreams reflects the current mood,[7] and disturbed sleep and harmful dreams usually concluded from perceived occupational and social distress or functional challenges.[1] For example, the content of a dream is usually negative among depressed individuals,[7] and these negative dreams, especially repeated dreams, can predict the tendency to suicide.[3]

Mutually, some researchers believe that base of the dream is derived from nonpsychological components, in fact

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physiological factors. According to this viewpoint, the relationship between dreams and emotions does not indicate psychological factors necessarily, and physiological and chronic physical factors may involve in this issue.[8] One of these chronic diseases is the cardiovascular problem which usually leads to psychiatric consequences such as depression and anxiety.[9,10] Cardiac patients usually experience great stress because of face to fetal risk or invasive treatment processes.[11] Hence, these patients are concerned as most main candidates to experience dreams related to threatening health disease or accompanied psychiatric situations. This issue shows the necessity to study the content of dreams in these patients. Although the first steps to explain dreams and their relationships with emotions began from about 500 years ago,[3] there are not many studies in this field, especially about cardiac patients. Hence, the present study aimed to assess (i) the rate of perceived dream and emotional load and content of dream and (ii) the relationship between dream with depression and anxiety.

## Methods

### Design and context

In this cross-sectional study, cardiovascular patients (May–October 2016) of Imam Ali hospital of Kermanshah city (Iran) were asked to participate in cardiac rehabilitation (CR) program. This center as a cardiac hospital in the west part of Iran has 214 beds.

### Participants

In this interval, 194 cases participated in a CR program. Inclusion criteria included fluency in Persian language, age range of 20–80 years, ability to recall and report on emotional load and content of dream after the cardiac procedure, and registration in CR program. After primary screening by the team of research, only 167 cases fulfilled the inclusion criteria or has the tendency to participate. Twenty-one people were excluded due to inability to recall and report on emotional load and content of their dream and six patients were omitted due to aging. These patients entered the study after written consent form and assurance about secret identity. The sample size higher than 60 cases is appropriate according to only two predictor factors.[12]

### Data collecting

One day before exercise and CR program, demographic data such as gender, education, occupational, and marital status and clinical data such as depression, anxiety, the rate of perceived dream, the content of dream, and emotions of the dream were collected by the psychologists of the team. Then, the questionnaires were provided to each patient. The patients filled these questionnaires after explanations by the psychologist. In the later phase, a cardiologist interviewed the patients individually and assessed their medical records. Then, the cardiologist recorded the medical histories that included a type of intervention and cardiac procedure,

family history of cardiac disease, histories of smoking, hypertension, diabetes, hyperlipidemia, and sedentary lifestyle in designed forms.

### Instruments

#### The Beck anxiety inventory

The scale is a 21-item examination of three scores for each item. The score of this questionnaire is varied from 0 to 63. The final score includes four levels of anxiety: (a) score 0–7 is equal to no anxiety; (b) score 8–15 is equal to mild anxiety; (c) score 16–25 is equal to moderate anxiety; and (d) score 26–63 is equal to severe anxiety. Cronbach's alpha of the inventory is 0.92, the credential using retest method with a 1-week interval is 0.75, and the consistency of the items is varied from 0.30 to 0.76. Validity types of this scale have also been confirmed.[13] Reliability and validity of this tool have been confirmed in the Iranian population.[14]

#### The Beck depression inventory

The inventory is a 21-item examination of three scores for each item. The score of this questionnaire is varied from 0 to 63. Interpreting the results is determined by five levels: 0–4 means possible denial, 5–9 is equal to very mild depression, 10–18 is equal to mild-to-moderate depression, 19–29 means moderate-to-severe depression, and 30–63 shows that the patient suffers from severe depression. Beck *et al*. discovered the retest reliability in a 1-week interval as 0.93.[15] Reliability and validity of this tool have been confirmed in the Iranian population.[16]

#### Single item to rating perceived dream rates

Due to the lack of access to a scale for measuring the perceived dream rate, we designed a single item using similar scales in the field of the dream.[4,17] In the form of this item, the patient is asked, "After the heart event/procedure, how much do you dream during a night's sleep?" The patient's response is graded from 0 (never) to 10 (every night).

#### Schredl's dream emotions manual

This scale involves a dream with any positive or negative emotion.[18] The emotional content intensity (both positive and negative emotions) is graded using the Likert spectrum in the 4-point category scale including none (=1), mild (=2), moderate (=3), or strong positive or negative emotions (=4). Interrater reliabilities for these scales in previous studies were 0.82 for negative emotions and 0.64 for positive emotions.[19]

#### The content analysis of dreams manual

The questionnaire was designed by Hall and Van de Castle.[20] The dream content formed of five emotional categories included anger, fear, happiness, sadness, and confusion/distress. To specify the type of emotion experienced, samples were selected between the five

categories. Meanwhile, participants can choose more than one item. According to the previous reports, the exact agreements for the Hall and Van de Castle system vary between 61% and 98%.[20] In relation with the ordinal rating scales, the coefficients are typically between 0.70 and 0.95.[18]

### Statistical analysis

Demographic data and medical and behavioral histories including gender, education, occupational and marital status, type of intervention and cardiac procedure, family history of cardiac disease, histories of smoking, hypertension, diabetes, hyperlipidemia, and sedentary lifestyle were reported. To compare the scores of depression, anxiety, and components of the dream between men and women, Chi-square and independent *t*-test were used at baseline. Furthermore, Pearson's correlative coefficient was used to assess the relationship between depression and anxiety with the content of dream and emotionally positive or negative dreams. Multiple regression analysis applied after approving about lack of roll-out of needed preassumptions.[12] Three departed types of regression were applied to assess the role of depression and anxiety to predict (a) the rate of the perceived dream, (b) emotionally positive dream, and (c) emotionally negative dream. SPSS 20 for Windows (IBM SPSS, Armonk, NY, USA) software was used for data analysis. All tests were performed as two ranges and $P < 0.05$ was considered statistically significant.

## Results

The mean age of participants (66.5% males) was $59.1 \pm 9$ years. Other demographics and risk factors for patients are shown in Table 1. Table 2 shows the proportion of the emotional content of dream in men and women and the mean (±standard deviation) of perceived dream scores, dream with positive or negative emotions, and anxiety and depression. The results indicate that there is a significant difference between the two groups in terms of dreams with sad content only ($P = 0.026$). In fact, women are more likely to report dream with sad content than men.

The results of Table 3 represent three models for predicting the dream components. As it seems, in model A, there is a significant direct relationship between the scores of anxiety and depression with the score of perceived dream rate ($P < 0.05$). In sum, this model is significant ($P = 0.030$) and can predict 4.2% variation of perceived dream rate. In model B, anxiety and depression have no significant relationship with the positive dream ($P < 0.05$). Finally, in model C, anxiety score with a negative dream score has a direct relation ($P = 0.003$). However, there is no relationship between depression and negative dream. Therefore, in this model, the most predictive power for a dream with negative emotional load is anxiety ($P = 0.007$). In general, the summary of this model shows that anxiety and depression can significantly predict negative dream ($P = 0.019$) and

**Table 1: Demographics and behavioral and medical histories of the samples**

| Characteristic | Female (*n*=56) | Male (*n*=111) | *P*a |
|---|---|---|---|
| Age | 58.1±9.3 | 59.7±8.9 | 0.293 |
| Education (%) | | | |
| Under diploma | 43 (76.8) | 59 (53.2) | 0.010 |
| Diploma | 8 (14.3) | 25 (22.5) | |
| Academic | 5 (8.9) | 27 (24.3) | |
| Job (%) | | | |
| Clerk | 2 (3.6) | 17 (15.3) | 0.001 |
| Self-employed | 1 (1.8) | 45 (40.5) | |
| Housekeeper | 49 (87.5) | 0 | |
| Retired | 4 (7.1) | 46 (41.5) | |
| Unemployed | 0 | 3 (2.7) | |
| Marital status (%) | | | |
| Single | 3 (5.4) | 0 | 0.001 |
| Marriage | 42 (75) | 109 (98.2) | |
| Separated | 11 (19.6) | 2 (1.8) | |
| Procedure (%) | | | |
| CABG | 46 (82.1) | 106 (95.5) | 0.007 |
| VHS | 9 (16.1) | 3 (2.7) | |
| PCI | 1 (1.8) | 2 (1.8) | |
| Risk factors (%) | | | |
| Smoking | 7 (12.5) | 63 (56.7) | 0.001 |
| HTN | 32 (57.1) | 33 (29.7) | 0.001 |
| DM | 13 (23.2) | 21 (18.9) | 0.515 |
| HLP | 24 (42.8) | 23 (20.7) | 0.003 |
| Family history | 38 (67.8) | 55 (49.5) | 0.025 |
| Sedentary lifestyle | 31 (55.4) | 55 (49.5) | 0.478 |

aChi-square used for the all analyses, independent *t*-test only used for the analyses related to age mean. CABG: Coronary Artery Bypass Graft, HTN: Hypertension, DM: Diabetes mellitus, HLP: Hyperlipoproteinemia, PCI: Percutaneous coronary intervention, VHS: Valvular heart surgery

they explain a total of 1.5% of the variance of the negative dream.

## Discussion

The present study aimed to assess the rate of perceived dream and emotional load and content of a dream and the relationship between dream functions with depression and anxiety. The results indicated that the rate of the perceived dream has a medium level and emotional content of dream has happiness and distress components among about half of patients. Furthermore, women reported more sadness dreams compared to men.

According to Hartman's idea, dreams reflect emotions of awaking life.[21] It is more probable that an emotion which experienced more severely is reflected in the dream.[22] Patients experience different challenges and emotions during life, especially when they are aware about the cardiac disease.[23] These real emotions are presented widely in sleep time.[21] Hence, individuals who have lesser worries about outcomes of disease probably experience dreams with positive emotions. In the present study, most

**Table 2: Comparison of female and male in terms of criterion variables**

| Variable | Total (*n*=167) | Female (*n*=56) | Male (*n*=111) | *P* |
|---|---|---|---|---|
| Dream content (%)[a] | | | | |
| Distress | 72 (43.1) | 24 (42.8) | 48 (43.2) | 0.537 |
| Anger | 5 (3) | 2 (3.6) | 3 (2.7) | 0.846 |
| Happy | 82 (49.1) | 30 (53.6) | 52 (46.8) | 0.850 |
| Fear | 22 (13.2) | 8 (14.3) | 14 (12.6) | 0.961 |
| Sad | 23 (13.8) | 13 (23.2) | 10 (9) | 0.026 |
| Perceived dream rate[b] | 4.45±2.97 | 4.59±2.97 | 4.39±2.98 | 0.679 |
| Positive dream[b] | 1.54±0.69 | 1.61±0.62 | 1.50±0.73 | 0.357 |
| Negative dream[b] | 1.58±0.87 | 1.57±0.85 | 1.58±0.89 | 0.953 |
| Anxiety[b] | 32.72±9.10 | 34.29±7.97 | 31.94±9.56 | 0.472 |
| Depression[b] | 16.24±3.91 | 16.55±2.77 | 16.10±4.38 | 0.116 |

[a]Chi-square used for the analyses, [b]Mean±SD were reported, independent *t*-test used for the analyses. SD: Standard deviation

**Table 3: The correlations and multiple regression for prediction of dreams**

| Model A | Perceived dream | | *B* | β | *t* | *P* |
|---|---|---|---|---|---|---|
| | *r* | *P* | | | | |
| Anxiety | 0.197 | 0.005 | 0.054 | 0.165 | 1.885 | 0.061 |
| Depression | 0.145 | 0.030 | 0.049 | 0.064 | 0.733 | 0.465 |
| **Model B** | **Positive dream** | | *B* | β | *t* | *P* |
| | *r* | *P* | | | | |
| Anxiety | 0.032 | 0.344 | −0.003 | −0.038 | −0.412 | 0.681 |
| Depression | 0.132 | 0.065 | 0.025 | 0.141 | 1.522 | 0.130 |
| **Model C** | **Negative dream** | | *B* | β | *t* | *P* |
| | *r* | *P* | | | | |
| Anxiety | 0.218 | 0.003 | 0.024 | 0.250 | 2.750 | 0.007 |
| Depression | 0.061 | 0.225 | −0.014 | −0.064 | −0.706 | 0.481 |

Summary of the model A: $R$=0.205; $R^2$=0.042; $F$=3.586; $P$=0.030, Summary of the model B: $R$=0.126; $R^2$=0.016; $F$=1.241; $P$=0.292, Summary of the model C: $R$=0.225; $R^2$=0.051; $F$=4.081; $P$=0.019

of the patients have limited depression and anxiety. Thus, it is expected that the emotional content of their dream is positive (for example happiness). Mutually, other patients who present more psychological distress are concerned as candidates to experience dreams with negative emotional load including distress, sad, fear, and anger. According to the model of emotion regulation function if patients experience negative emotions of awaking time in the format of dreams they can cope with them more easily.[24,25]

However, why the women's dream is sadder compared to men is probably due to the experience of depression. The studies in the field of psychological outcomes of cardiac diseases indicate that women experience depression more than men.[26] Furthermore, in the present study, the score of women's depression is higher than men. On the other hand, sad, blue, and hopeless are concerned as the basic criteria for depression. Hence, it is expected that women are more depressed than men and they experience sadder dreams according to their moods. It is possible that this mechanism is effective in primary adjustment with sad of real-life events.[24,25]

Another finding indicated that depression and especially anxiety are predictors for increasing rate of perceived dream

and emotionally negative dreams. According to this finding, the past reports suggest that recall of dream, duration of dream, and content of dream can be a reflection of developing a process of the psychopathology of psychiatric disorders such as depression and anxiety.[3,5] These studies indicate that psychiatric factors such as mood and anxiety disorders[3,5] and other psychological issues[6] are related to the content of dream among general and clinical populations. Thus, it can be suggested that content of dream usually reflects the patients' routine mood and anxiety and depressed individuals usually have dreams with emotionally negative content.[7] In addition, coordination between negative mood and negative content of dreams leads to more recall of dreams. Hence, it is expected that cardiac patients with high level of depression and anxiety after cardiac intervention or procedure[9,10] are more involved with emotionally negative dreams and recall them.

## Conclusion

The increased rates of depression, especially anxiety, are related to increasing perceived dreams with negative and harmful emotional load. Regarding severity and negative content of dreams are reflexes of stressful emotional daily experiences, the management of experienced psychological

symptoms such as depression and anxiety is concerned as an undeniable necessity.

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## Conflicts of interest

There are no conflicts of interest.

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