What is role of sex and age differences in marital conflict and stress of patients under Cardiac Rehabilitation Program?

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Original Article

Abstract

BACKGROUND: To investigate the role of sex and age differences in marital conflict and stress of patients who were under cardiac rehabilitation (CR) program.

METHODS: The data of this cross-sectional study were collected from the database of the CR Department of Imam Ali Hospital, Kermanshah, Iran. The demographics and medical data of 683 persons were collected from January 2003 and January 2010 using medical records, the Beck Anxiety Inventory, the Beck Depression Inventory, the Hudson's Index of Marital Stress, and the Structured Clinical Interview for axis I disorders. Data were analyzed through Analysis of Covariance and Bonferroni test.

RESULTS: About 74.8% of the subjects were male. After adjustment for age, educational level, anxiety, and depression-the findings showed that women in CR program had a higher level of marital stress compared to men (54.75 ± 2.52 vs. 49.30 ± 0.89; $P = 0.042$). Furthermore, it was revealed that women who aged 56-65 years and more experienced higher level of marital stress compared to younger patients ($P < 0.050$); however, no significant difference was observed between different age groups in male patients ($P > 0.050$).

CONCLUSION: Marital conflict and stress threaten healthiness of women who aged 56-65 years more prominently than does in males or younger patients. Regarding the effect of marital stress on recurrence of the disease and cardiac-related morbidity and mortality in women, providing effective education and interventions to this group of patients, especially older women and even their spouses could be one of the useful objectives of CR programs.

Keywords: Marital Conflict, Psychologic Stress, Sex Differences, Rehabilitation, Cardiac Disease

Introduction

The protective and supportive effects of marriage on healthiness and well-being, in general, population have been demonstrated. It is stated that married individuals have better physical and psychological healthiness than single ones.[1] In patients with cardiovascular diseases (CVDs), as a subset of clinically encountered patients, the role of marriage and being married in the development of the disease and its outcomes has gained attention of the researchers in recent years.[2,3] Recent findings show that there is relationship between marital state and CVDs morbidity and mortality. The likelihood of premature death in single men and divorced women is significantly higher compared to other groups.[4] Furthermore, among married patients in age group of 45-64 years face premature death less likely in comparison to other groups.[5]

Even though these researches have indicated the positive role of being married on disease, it seems that the state of being married itself may have challenges which have not been investigated thoroughly in cardiac patients. One of these challenges is an inappropriate interaction between couples and marital stress. It has been stated that marital stress as a chronic between person stress decreases the immune function of the body, in particular, in older people. Marital stress, not only increases the risk of health problems such as CVDs,[6] but also challenges health behaviors of patients such as nutrition management.[7] Although the

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mechanisms through which marital conflicts affect the healthiness of people,[8] it is evident that negative marital interactions are related to some cardiac reaction indices such as heart rate and systolic blood pressure in both males and females.[9] Marital stress not only increases the recurrence risk of cardiac events into 3-fold in a 5-year period[10] but also independently aggravates depression, anxiety, anger, and hostility in cardiac rehabilitation (CR) patients.[11,12] Marital stress also negatively affects the social relations of women.[13] It also predicts the risk of longer hospitalization after cardiac surgery in women[14] and in men.[15] In addition, appropriate quality of marital relationship especially in female patients with cardiac diseases inhibits systolic hypertension[16] and significantly predicts 4 to 8-year survival.[17,18]

Despite the aforementioned evidence, it is not yet clear exactly that which age or gender groups are affected more by marital stress. As negative aspects of marital relationship affect more significantly physiologic functions of women compared to men,[19] and survival of patients older than 64 years is at higher risk,[5] access to a response to this question is equivocal. Furthermore, designing of appropriate therapeutic procedures requires knowledge about the effect of sex and age on marital stress. Along with gender, age as one of the most important biomarkers among non-specific parameters of cardiac diseases has the highest effect on the disease evolution[20] and increasing age is associated with the risk of development and establishment of CVDs.[21] This issue shows the necessity of evaluation of marital stress in patients in different age groups. Therefore, here two questions arise and the current study was carried out with the purpose of answering to these two questions. The first question is that whether marital stress is higher in female or male patients in CR program? The second question is that which age group experiences the greatest level of marital stress?

Materials and Methods

In this cross-sectional study, the data were collected through the CR Department of Imam-Ali Hospital in Kermanshah, Iran. Kermanshah is located 525 km (326 miles) from Tehran in the western part of Iran. According to the 2011 census, its population is 851,405. People mostly speak Southern Kurdish and Persian. The city has a moderate and mountainous climate. Kermanshah is one of the western agricultural core of Iran that produces grain, rice, vegetable, fruits, and oilseeds; however, Kermanshah is emerging as a fairly important industrial city. Imam-Ali Hospital is a state specialized hospital for cardiology in Kermanshah, and the patients residing in Western Iran, in general, visit this hospital. The hospital includes intensive care unit and critical care unit Parts, Cardiac Surgery Department, Emergency Department, CR Unit, and Heart Research Center. Moreover, the governmental hospital has 214 beds. The database of this hospital is consists of data about different types of heart diseases especially cardiac surgery that has been enrolled in CR programs after the cardiac event had occurred. The demographic and medical data of the patients including the comorbidities, psychological health, and the early risk factors are registered in the database. The registration checklists are provided by heart health professionals and specialists under the supervision of Kermanshah University of Medical Sciences (KUMSs). The control center of the KUMS confirms the accuracy of the collected data 2 times in the year. Moreover, to evaluate the psychological state of the cardiac patients including anxiety, depression, and marital stress, standard tools such as the Beck inventories and structured clinical interview (SCID-I) for comorbidities are used in the start of CR in this center. In addition, the self-reported checklists for the illiterate patients were read by the psychologist of the ward and then the answers were registered.

1. Age between 30 and 85 years
2. Being married
3. Lack of substance abuse currently
4. The absence of stabilized psychosis.

We recognized 725 patients under CR enrolled in a 7-year period between January 2003 and January 2010. 22 patients were excluded due to the lack of inclusion criteria. Then, the data of other patients were used for the analysis. However, information of some of them was

confronted with missing data in some items which caused the SPSS software (version 20, SPSS Inc., Chicago, IL, USA) to exclude 20 patients. Thus, the sample size ultimately was declined to 683 persons. We did not perform sampling for selection of participants, but all patients in the mentioned period were enrolled - with the exception of patients without inclusion criteria. Given that there are 8 cells (four age groups × two genders × single dependent variable = 8) and it is recommended that would have existed in each cell 20 people,[22] as the result seems to be enough sample size 160 people. Thus, our sample size (n = 683) is appropriate. Furthermore, due to ethical considerations and after approval of the Ethics Committee of KUMS in January 2015, the patients data were used as confidential and anonymous to protect their privacy.

SCID-I assesses the axis I psychiatric disorders. This instrument is consists of 6 parts for assessments of diagnostic criteria of the 38 disorders such as anxiety and mood disorders and psychosis. The SCID-I done usually in one session and it takes between 45 and 90 minutes.[23] The reliability and validity of the tool for various disorders on axis I is appropriate. The Kappa values of the axis I disorders varied from 0.61 to 0.83, with a mean Kappa of 0.71 (0.60 for agoraphobia to 0.83 for specific and social phobia). Furthermore, the study results showed good inter-rater agreement of the axis I disorders.[24] The Kappa values of Persian version for various disorders are appropriate (0.60 and higher).[25]

• The Beck Anxiety Inventory is consists of 21 items, three scores awarded to each question, and its total score is calculated from 0 to 63. If the score is between 0 and 7, there is no anxiety; if the score is from 8 to 15, there is a mild anxiety; and if the score is from 16 to 25, the patient has moderate anxiety and ultimately; if the patient scores from 26 to 63, the patient suffers from severe anxiety. Cronbach's alpha of the inventory is 0.92, the credential using retest method with 1 week interval is 0.75, and the consistency of the items ranges from 0.30 to 0.76. The content validity revealed that it is suitable to measuring the intensity of anxiety.[26] In Iran, Kaviani and Mousavi were reported the inventory Cronbach's alpha 0.92 and

they found that its validity and reliability is appropriate (P < 0.001).[27]

• The Beck Depression Inventory is a 21 items exam of 3 scores for each item. The score of this exam is varied from 0 to 63. Interpreting the results is determined as follows: 0-4 means depression denial; 5-9 equals to very mild depression; 10-18 means the patient has mild to moderate depression; if the patient scores from 19 to 29, it shows moderate to severe depression and the score more than 30 shows that the patients suffer from severe depression. Beck et al. discovered the retest reliability index in 1 week interval as 0.93.[28] Based on the results of a study in Iran, the inventory validity (convergent validity with general health questionnaire-28; r = 0.80) and reliability (Cronbach's alpha 0.92) is appropriate.[29]

• Hudson's index of marital stress is a 25 item scale that evaluates the severity of the marital conflict. 13 items of the scale are scored directly and 12 items are scored in reverse. Answers are graded based on the Likert 5-point (rarely to most of the time). The positively worded items were scored in the reverse such that 1 was rescored as 5, 2 as 4, 3 remained as 3, 4 as 2 and 5 as 1. The positively worded items were 1, 3, 5, 8, 9, 11, 13, 16, 17, 19, 20, 21, 23. After this, all the scores were summed up. Score higher than 30 means a considerable marital conflict. However, scores higher than 70 means strong and stable marital conflict. Cronbach's alpha of the scale items is 0.96 which it is indicator from suitable reliability.[30] Based on the results of Sanaei in Iran, the scale validity (content validity with enrich marital satisfaction scale; r = 0.86) is appropriate.[31]

We used percentage for report of nominal variables including baseline demographics and risk factors history. Then, these variables were compared between female and male using the chi-squared test. Mean and standard deviation (SD) used for continuous quantitative variables and independent t-test were used for comparison of mean scores of the baseline continuous variables including age, anxiety, and depression. Data normality and outliers were studied with used Kolmogorov–Smirnov test. In addition, preliminary checks were conducted to ensure that there was no violation of the other

assumptions of linearity and homogeneity of variances.[22] Then, the Analysis of Covariance (ANCOVA) and the Bonferroni test was used for comparison of marital stress among the sex and age groups. Applying the covariance analysis using the SPSS software for Windows (version 21.0, SPSS Inc., Chicago, IL, USA) software program, the effect of age, education level, anxiety, and depression in the sex groups was controlled. However, merely the effect of education level, anxiety, and depression was controlled to examine age groups. In the ANCOVA analysis was reported a mean and standard error (SE). The $P < 0.050$ concerned as significant level.

Results

Of the total 683 patients, 511 (74.8%) were male.

The age ranges of female and male were 32-82 and 35-82 years, respectively. The total mean $\pm$ SD of marital stress was 50.77 ± 19.66. The baseline demographic and clinical variables of the participants are shown in table 1. The table results show significance different between female and male in term of education level, occupation, anxiety, and depression ($P < 0.001$). In addition, non-adjusted and adjusted means $\pm$ SE of marital stress of the sex groups are shown in table 2. It was revealed that marital stress is significantly higher among female compared to male, both before adjustment for age, education level, anxiety, and depression (57.53 ± 6.05 vs. 48.49 ± 2.96; $P < 0.001$) and after it (54.75 ± 2.52 vs. 49.30 ± 0.89; $P = 0.042$).

Table 1. Baseline demographic and clinical characteristics in the cardiac rehabilitation (CR) female and male

Characteristic	Total (n = 683)	Female (n = 172)	Male (n = 511)	P[**,***]
Demographic characteristics				
Education degree (%)				
Illiterate	36.6	64.5	27.2	< 0.001[*]
Less than diploma	33.8	24.4	37.0	
Diploma	16.7	6.4	20.2	
Academic	12.9	4.7	15.6	
Occupation (%)				
Market	40.4	0.6	53.8	< 0.001[*]
Clerk	10.7	1.7	13.7	
Retired	25.5	4.7	32.5	
Housewife	23.4	93.0	0.0	
Clinical characteristics				
Index procedure (%)				0.194
CABG	96.9	96.3	98.4	
VHD	1.1	1.3	0.1	
PCI	2.0	2.0	1.5	
Cardiac risk factors (%)				
Diabetes	37.6	34.8	37.9	0.645
Hypertension	30.7	34.8	30.2	0.475
Hyperlipidemia	57.7	56.1	57.9	0.780
Age (mean $\pm$ SD)	57.66 $\pm$ 9.21	56.97 $\pm$ 8.43	57.89 $\pm$ 9.46	0.2610
Anxiety (mean $\pm$ SD)	30.06 $\pm$ 11.85	36.87 $\pm$ 10.76	27.77 $\pm$ 11.31	< 0.001[*]
Depression (mean $\pm$ SD)	17.18 $\pm$ 3.40	18.51 $\pm$ 3.12	16.65 $\pm$ 3.36	< 0.001[*]

Significant difference between female and male for each characteristic [*] $P < 0.001$; [**] Chi-square test performed for nominal and categorical variables; [***] t-test performed for continuous variables; CABG: Coronary artery bypass graft surgery; VHD: Valvular heart disease; PCI: Percutaneous coronary intervention; SD: Standard deviation

Table 2. The compare of the marital stress mean between female and male before and after adjustment

Characteristics	Marital stress (mean ± SE) (Non-adjusted)	P	Marital stress (mean ± SE) (Adjusted)	P
Sex				
Female	57.53 ± 6.05	0.001[*]	54.75 ± 2.52	0.042[**]
Male	48.49 ± 2.96		49.30 ± 0.89	

Significant difference between female and male for each characteristic; [*] P < 0.010; [**] P < 0.050; SE: Standard error

Table 3 presents the patients' marital stress in different age groups in either gender. The results of table show there is not different between non-adjusted means ± SE of female and male (P = 0.773). In addition, after adjustment for educational level, anxiety, and depression no significant difference was observed regarding marital stress between different age groups in male (P = 0.636). However, significant differences were observed in term of marital stress adjusted mean between different age groups in female (P < 0.001). The results of Bonferroni post-hoc test to find differences in marital stress between different age groups in either gender are presented in table 4. After adjustment for education level, anxiety, and depression, the results of the table show that female who aged 56-65 years had significantly higher level of marital stress compared to younger age groups including ≤ 45 years (76.40 ± 5.90 vs. 45.72 ± 7.69; P = 0.013) and 46-55 years (76.40 ± 5.90 vs. 48.77 ± 4.84; P = 0.002). Furthermore, it is obvious that no significant difference was seen between patients > 65 years with other age groups (P > 0.050).

Discussion

The study was done with the objective of finding difference in marital stress level between genders and also between different age groups of patients who were receiving CR program. The results showed that women experienced higher levels of marital stress compared to men. Plus, age did not have a role in marital stress among men. However, women who aged 56-65 years experienced higher level of marital stress compared to their younger counterparts. In justification of the observed results, it could be stated that women generally are more vulnerable to mental disorders including depression, stress, and anxiety.[32-34] Therefore, it can be expected that marital stress, as one of the items of general chronic stress, to be more severe in women. In support of this finding, the results of a study in 2014 showed that women were more likely to relate their cardiac condition to psychological risk factors, especially stress.[35] As there is relationship between perceived and real risk factors,[36] higher rate of stress reported by women seems natural.

Table 3. The compare of the marital stress in different age groups of female and male

Characteristics	Marital stress (mean ± SE) (Non-adjusted)	P	Marital stress (mean ± SE) (Adjusted)	P
Female				
Age (year)		0.102		0.001[*]
≤ 45 (n = 14)	44.93 ± 11.59		45.72 ± 7.69	
46-55 (n = 56)	55.27 ± 6.05		48.77 ± 4.84	
56-65 (n = 75)	60.61 ± 4.96		76.40 ± 5.90	
> 65 (n = 27)	60.22 ± 6.25		48.72 ± 10.64	
Male				
Age (year)		0.773		0.636
≤ 45 (n = 48)	49.94 ± 4.63		51.78 ± 4.61	
46-55 (n = 161)	48.14 ± 2.82		47.29 ± 1.35	
56-65 (n = 194)	49.10 ± 2.58		48.85 ± 1.37	
> 65 (n = 108)	47.28 ± 3.10		50.05 ± 2.73	

Significant difference between patients for each characteristic; [*] P < 0.010; SE: Standard error

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Table 4. The multi-compare of the marital stress in different age groups before and after adjustment

Group (I)	Group (J)	Mean difference (SE) (Non-adjusted)	P	Mean difference (SE) (Adjusted)	P
Female					
≤ 45	46-55	-10.339 (6.918)	0.823	-3.048 (9.199)	0.999
	56-65	-15.685 (6.741)	0.131	-30.677 (9.871)	0.013[*]
	> 65	-15.294 (7.625)	0.280	-2.993 (13.139)	0.999
46-55	56-65	-5.345 (4.089)	0.999	-27.629 (7.544)	0.002[**]
	> 65	-4.954 (5.425)	0.999	0.055 (11.695)	0.999
56-65	> 65	0.391 (5.196)	0.999	27.684 (12.152)	0.144
Male					
≤ 45	46-55	1.801 (2.916)	0.999	4.492 (4.795)	0.999
	56-65	0.834 (2.858)	0.999	2.927 (4.809)	0.999
	> 65	2.660 (3.076)	0.990	1.728 (5.374)	0.999
46-55	56-65	-0.966 (1.890)	0.999	-1.565 (1.918)	0.999
	> 65	0.859 (2.205)	0.999	-2.764 (3.048)	0.999
56-65	> 65	1.825 (2.129)	0.999	-1.199 (3.046)	0.999

Significant difference between patients for each characteristic; [*] $P < 0.050$; [**] $P < 0.010$; SE: Standard error

Women are more sensitive to familial stress than men and marital arguments affect their psychological and physiologic health more prominently.[11] They usually spend more time about thinking of marital relationship especially its negative aspects.[14] The rate of expressing anger of marital conflicts is fewer in women. This per se increases the risk of death from cardiac events four times.[37] In women, the quality of the marital relationship is generally affected by the perceived quality of the support by spouse[14] and if women perceive their spouse support more positively there will be less marital stress and better survival.[18] Therefore, it is obvious that gender is a factor that affects more negative perception of marital interactions in women. Due to stronger emotional responses in women, they report higher level of marital stress than men do.

Regarding the effect of age on marital stress, compatible with our results, Zare et al. reported that getting older and longer marriage duration is associated with decreased marital satisfaction in women.[38] Older women as a result of longer duration of their marriage and facing various difficulties throughout these years such as economic issues and problems with children[39] have spent more years with marital conflicts and possible disputes and since Iranian culture has a negative view toward divorce, social coercion to continue the marriage is probably followed by chronic marital stress.

Another justification is the educational level of these patients. Older patients have lower educational level compared to younger women and this state can lead to disagreement between couples and marital conflict.[38] In addition, since these women are illiterate or have a low level of education and have no job, they usually spend more time inside the household and spend less time in outdoor and leisure activities. This state leads to the feeling that home environment is repetitive in days after days, and therefore, women may feel pressure and inability to change the environment. Finally, older women have more physical problems and more limited range of motion which prohibit them from doing activities such as daily walking. Therefore, staying at home leads to nervousness and more marital disputes.

Overall, although CVD is a widespread problem throughout the world, marriage and marital relationship is primarily a cross-cultural issue. Our study participants were mostly Kurdish language that may have certain marital problems. Thus, the study results can help to increase the knowledge of health professionals both about this psychological risk factor and sex and age groups at risk and vulnerable.

Our study has several strengths and limitations. First, marital stress is one of the factors that has received less attention in previous studies. Other strength is the study of one of the aspects of general stress separately.

Using data from a large sample is other advantage our study. Conversely, one of the limitations of our study was that the data were collected from only one hospital. Therefore, caution is required in the generalizing results. The other limitation was lower number of female patients in the research. Therefore, it is recommended to survey more samples throughout the Iran and study more women in the upcoming studies. A third of our limitation was the retrospective nature of some of the collected data. In addition, there was no possibility to control for all confounding variables.

Conclusion

Marital stress threatens healthiness of women who aged 56-65 years more prominently than does in males or younger patients. Regarding the effect of marital stress on recurrence of the disease and cardiac-related morbidity and mortality in women, providing effective education and interventions to this group of patients, especially older women and even their spouses could be one of the useful objectives of CR programs.

Conflict of Interests

Authors have no conflict of interests.

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