

## ORIGINAL RESEARCH—PSYCHOLOGY

# Intercourse Avoidance among Women with Coronary Artery Disease

Shervin Assari, MD, MPH\*†

\*Department of Health Behavior and Health Education, University of Michigan School of Public Health, Ann Arbor, MI, USA; †Center for Research on Ethnicity, Culture, and Health (CRECH), University of Michigan School of Public Health, Ann Arbor, MI, USA

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### ABSTRACT

**Introduction.** Avoidance of sexual intercourse has not been frequently studied among patients with chronic medical conditions and patients with coronary artery disease (CAD) are not exception.

**Aim.** We aimed to (i) compare intercourse avoidance during the past 2 weeks among women with CAD and healthy controls; and (ii) to determine factors associated with intercourse avoidance during the past 2 weeks among women with CAD.

**Methods.** This study was conducted in an outpatient cardiology clinic in Tehran, Iran. The study included 152 married women with CAD and 50 controls. Socio-demographic and clinical data including the severity of angina (WHO Rose Questionnaire), risk factors (cigarette smoking, hyperlipidemia, diabetes, and obesity), fatigue, physical function (visual analogue scale [VAS]) and somatic comorbidities [Ifudu index], symptoms of anxiety and depression (Hospital Anxiety and Depression Scale [HADS]), and dyadic adjustment (Revised-Dyadic Adjustment Scale [R-DAS]) were considered as independent variables. Logistic regression was used to determine predictors of sexual avoidance during the past 2 weeks.

**Main Outcome Measures.** The main outcome was intercourse avoidance over a 2-week period, measured by the Relation and Sexuality Scale (RSS).

**Result.** Avoidance of intercourse during the past 2 weeks was higher among women with CAD than controls (73.0% vs. 56%,  $P = 0.024$ ). According to the logistic regression, intercourse avoidance was positively associated with age (Odds ratio [OR] = 1.127, 95% confidence interval [CI] = 1.073, 1.185), somatic comorbidities (OR = 1.137, 95% CI = 1.061, 1.218) and depressive symptoms (OR = 1.150, 95% CI = 1.022, 1.293).

**Conclusion.** Our study suggests that among women with CAD, age, depressive symptoms and somatic comorbidities are associated with avoidance of intercourse. As having intercourse is safe among patients with stable CAD, all health professionals should discuss sexual behaviors with their female CAD patients, especially those that are older, with higher depressive symptoms or multiple comorbidities so as to allay fears about sexual functioning. **Assari S. Intercourse avoidance among women with coronary artery disease. J Sex Med 2014;11:1709–1716.**

**Key Words.** Coronary Artery Disease; Heart Disease; Sexual Function; Sexual Intercourse; Avoidance of Sexual Intercourse; Dyadic Adjustment; Psychological Status; Somatic Comorbidities

### Introduction

Although intercourse is safe among patients with coronary artery disease (CAD), a major proportion of patients may avoid sexual intercourse [1]. Intercourse avoidance is an indicator of

poor sexual function [2] and may reduce quality of life [3]. Although people may also avoid sex for reasons such as pain or body image [4,5], concerns about possible health effects are also another reason that make patients with chronic conditions such as CAD avoid sex [6].

Decreased sexual activity among cardiac patients is frequently reported [7]. Concerns about possible negative consequences of sexual activity may lead to reduced sexual activity among patients with CAD [8–10]. The American Heart Association scientific statement regarding sexual activity among patients with CAD has well addressed safety and timing of return to sexual activity after cardiac events [7]. Literature has shown that patients with CAD can enjoy a sexually active life [1]. The risk of experiencing any severe complication during sexual activity in these patients is far less than that expected by patients and their partners. Statistics show that sexual activity is a contributor to myocardial infarction (MI) in less than 1% of the patients [11].

Although among patients with CAD comorbid mental and somatic conditions contribute to a reduced well-being [12–15], and sexual function is an important indicator of well-being [16–18], there is a dearth of information about possible influence of anxiety, depression, and somatic comorbidities on sexual activity among women with CAD [19–21]. Historically, most of the literature on sexuality has focused on sexual dysfunction rather than sexual activity. As a result, there is need for studies on associated factors of sexual avoidance among female patients with CAD.

This study sought to compare intercourse avoidance between women with CAD and their matched controls, and to determine factors associated with intercourse avoidance among women with CAD.

## Methods

### *Design and Setting*

This cross-sectional study was conducted in the outpatient cardiology clinic of a tertiary hospital in Tehran, Iran. The study was approved by the in-house ethics committee of the hospital. Written informed consent was obtained from all participants. Interviews were completed in a confidential setting, and the patients' information was kept confidential.

One hundred and fifty two patients with documented CAD and also 50 socio-demographically—matched healthy controls were enrolled to this study. This study defined CAD as presence of stenosis higher than 50% in at least one major coronary artery on angiography. Participants were selected from patients participating in outpatient follow-up in the cardiology clinic. Inclusion criteria consisted of being married for a minimum of

1 year, and not having a disabling psychiatric disorder. Having a history of MI or hospitalization due to CAD during the past 6 months were among the exclusion criteria.

A convenience sample of healthy control females with no chronic conditions was selected from subway stations and parks in Tehran. Age, education level, income, and living place were not significantly different between the two groups ( $P > 0.05$  for all comparisons).

### *Measurements*

Socio-demographic data (age, education level, income, and living place) and clinical data (angina grade, cigarette smoking, body mass index [BMI], chronic obstructive pulmonary disease [COPD], hypertension [HTN], cardiovascular accidents [CVA], hyperlipidemia [HLP], and diabetes) as well as symptoms of anxiety, symptoms of depression, somatic comorbidity, dyadic adjustment, and fatigue and physical function (VAS) of all the subjects were assessed. Participants filled out the self-administered questionnaires after a trained sex-matched research assistant provided them with the required instructions.

### *Questionnaires*

#### **Angina Grade**

The World Health Organization (WHO)'s angina pectoris questionnaire was used for chest pain [18]. Angina pectoris was defined based on the standard criteria for chest pain or discomfort with the following characteristics: (i) the site must include *either* the sternum (any level) *or* the left anterior chest wall and the left arm; (ii) it must be provoked by either hurrying or walking uphill or walking on the level ground; (iii) if occurred while walking it must make the subject either stop walking or slacken his/her pace, unless nitrates are taken; and (iv) it must disappear within 10 minutes from the time upon which the subject stands still. Even in the absence of one of these criteria, the subject is not considered to have angina pectoris [22].

#### **Anxiety and Depression Symptoms**

The Hospital Anxiety and Depression Scale (HADS), comprised of 14 statements relevant to generalized anxiety (7 items) and depression (7 items) [23], was also employed. With a Cronbach's Alpha coefficient equal to 0.78 for the HADS anxiety sub-scale and 0.86 for the HADS depression sub-scale, the translated version of HADS is routinely used in Iran [24–26]. In this test, four possible answers with scores ranging from zero to

three are provided for each question. The maximum score for each scale is estimated to be 21. Based on the Zigmund and Snaith cut point, scores greater than 8 are considered as abnormal depression and anxiety symptoms [23].

### Somatic Comorbidity

Somatic comorbidity was measured based on a modified Ifudu Scale, a numerical scale devised for the measurement of comorbidity in patients undergoing hemodialysis. The 12-component index is qualified for evaluating the function of 12 main systems in the human body: 1) non-ischemic cardiovascular problems, 2) respiratory diseases, 3) autonomic neuropathy, 4) other neurologic problems, 5) neuromuscular disorders, 6) infections including AIDS, 7) liver, pancreases and biliary diseases (hepatitis, hepatic disorder, and pancreatic enzyme defect), 8) hematologic problems, 9) vertebral column problems, lower back pain, or arthritis, 10) visual disorders, 11) limb amputation (from finger amputation up to lower extremity amputation) and 12) genitourinary diseases. Scores between 0 (absence of comorbidities) and 3 (presence of severe comorbidities) are dedicated to each component. The total comorbidity score was calculated by adding the scores gained in the above mentioned items; all calculations were made by a single internist, who sought consultation when necessary. The scale ranged between 0–36, with a higher score representing more comorbidity [27]. Although this measure is originally developed for patients with chronic kidney disease, this measure has been repeatedly used in a wide range of other chronic conditions such as respiratory disease, blood disease, and rheumatologic conditions, and even ischemic heart disease [28–33].

### Dyadic Adjustment

The Revised-Dyadic Adjustment Scale (R-DAS) was utilized to assess the patients' dyadic relationships. The R-DAS consists of 14 items that evaluated the agreement of a couple upon different decisions, appropriate behavior, and dyadic satisfaction and cohesion. The R-DAS scores range from 0 to 69, with "distressed relation" having the lowest score [34]. A Farsi version of the questionnaire was previously developed and validated in Iran [35]. In the present study, the Cronbach's Alpha coefficient for the questionnaire was 0.90.

### Fatigue

Fatigue was measured using the Visual Analog Scale (VAS). In this regard, a 100-mm line,

with one end (100) suggesting "no problem what so ever" and the other end (0) anchored by "unbearable", was applied. The patients were then instructed to place a vertical mark on the scale in order to report their health status. A higher score indicated a better health status [36].

### Physical Dysfunction

Physical function was also measured using VAS, with the higher score indicating a better status.

### Main Outcome Measurement

Intercourse avoidance in the past 2 weeks was determined using the Relation and Sexuality Scale (RSS): The questionnaire asks respondents about engagement in intercourse in the past 2 weeks. Responses include never (0), once (1), twice (2), three times (3), and four times or more (4). In this study a response of none was considered as intercourse avoidance. A Persian translation of RSS has been utilized to measure sexual activity of male and female patients with CAD [37–43]. Reliability of this measure was .694 in our study. This scale score is correlated with worse dyadic relationship, lower quality of life, and higher anxiety, depression, and somatic comorbidities (Appendix).

### Statistical Analyses

The statistical analysis was carried out with SPSS software for Windows version 13. Independent sample *t*-tests were used to determine the association between intercourse avoidance and age, BMI, symptoms of anxiety, symptoms of depression, somatic comorbidity and dyadic adjustment. The association between nominal data such as educational level and intercourse avoidance, on the other hand, was evaluated using a chi-square test. A logistic regression model was applied to determine the predictors of intercourse avoidance. *P* values lower than 0.05 were considered significant.

## Results

### Comparison of Patients with CAD and Controls

Seventy percent of participants who were invited to the study provided data on sexual behavior, thus 152 patients with CAD and 50 healthy controls enrolled in this analysis. The patients with CAD and the healthy controls were not different in terms of age ( $56.5 \pm 9.1$  vs.  $53.8 \pm 8.0$ ,  $P = 0.08$ ), education level (16 [10.5%] vs. 10 [20%],  $P = 0.083$ ), living in urban areas (138 [90.8%] vs.

45 [97.8%],  $P = 0.114$ ), and income level lower than 300 \$US (15 [9.9%] vs. 9 [18%],  $P = 0.123$ ).

#### Avoidance of Intercourse among Women with CAD vs. Controls

Avoidance of intercourse during the past 2 weeks was higher among women with CAD than among women in the control group (111; 73.0% vs. 28; 56%,  $P = 0.024$ ).

#### Patients with CAD

The mean age of the patients with CAD was  $56.5 \pm 9.1$  years. Of these, 136 (89.5%) patients had an education level lower than a high school diploma, 137 (90.1%) had a monthly family income lower than 300 \$ US, and 138 (90.8%) were city dwellers.

Frequencies of sexual intercourse over the past 2 weeks were once among 22.4%, twice among 2.6%, and more than twice among 2%. 111 (73%) patients reported having no intercourse in the past 2 weeks.

#### Bivariate Analysis among Women with CAD

Women reporting intercourse avoidance were older than those engaged in sexual intercourse (mean age:  $58.4 \pm 8.7$  vs.  $51.3 \pm 9.4$ ,  $P < 0.001$ ). There was no significant difference between the educational status, family income, and living place of the two groups.

Some 56 (50.5%) of the women reporting intercourse avoidance and 12 (29.3%) of those who were engaged in a sexual relation had a positive history of CVA; the difference between the two groups was significant ( $P = 0.020$ ). CAD was the only clinical condition predicting ones engagement in sexual relations, stressing that medical conditions including COPD, HTN, HLP, diabetes, BMI, cigarette smoking and the Rose Angina Questionnaire have no effect on sexual avoidance. The results of the bivariate analysis of symptoms of anxiety, symptoms of depression, somatic comorbidity, dyadic adjustment, fatigue and physical function in the two groups are presented in Table 1.

#### Multivariate Analysis among Women with CAD

According to the logistic regression, the likelihood of experiencing intercourse avoidance increased in older ages (Odds ratio [OR] = 1.127, 95% confidence interval [CI] = 1.073, 1.185) and in those with more somatic comorbidities (OR = 1.137,

**Table 1** Comparisons of anxiety, depression, somatic comorbidity, marital adjustment, and quality of life between patients who had and those who did not have sexual intercourse in a 2-week period prior to study

	Intercourse		P
	No Mean $\pm$ SD*	Yes Mean $\pm$ SD*	
<b>HADS</b>			
Anxiety symptoms (0–18)	9.74 $\pm$ 5.89	7.82 $\pm$ 6.38	0.101
Depression symptoms (0–24)	8.60 $\pm$ 3.45	6.51 $\pm$ 3.31	0.002 <sup>†</sup>
<b>Ifudu</b>			
Somatic comorbidity (0–42)	15.77 $\pm$ 6.76	12.76 $\pm$ 7.63	0.020 <sup>†</sup>
<b>R-DAS</b>			
Dyadic consensus (0–20)	16.38 $\pm$ 3.85	16.90 $\pm$ 3.95	0.464
Affectional expression (0–10)	8.92 $\pm$ 2.54	9.05 $\pm$ 2.49	0.778
Dyadic satisfaction (0–20)	13.97 $\pm$ 5.72	16.34 $\pm$ 4.37	0.008 <sup>†</sup>
Dyadic cohesion (0–19)	11.32 $\pm$ 5.07	12.71 $\pm$ 4.47	0.124
Total score (0–69)	50.59 $\pm$ 12.88	55.00 $\pm$ 12.67	0.062
<b>VAS</b>			
Physical function (0–100)	33.90 $\pm$ 23.94	44.49 $\pm$ 27.09	0.023 <sup>†</sup>
Fatigue (0–100)	49.59 $\pm$ 24.33	38.09 $\pm$ 24.20	0.010 <sup>†</sup>

\*Standard deviation.

<sup>†</sup>Significant.

HADS = hospital anxiety and depression score; R-DAS = revised-dyadic adjustment scale; VAS = visual analog scale

95% CI = 1.061, 1.218) and higher depression symptoms (OR = 1.150, 95% CI = 1.022, 1.293).

#### Discussion

Intercourse avoidance during a 2-week time interval seems to be more common among women with CAD than among the controls. Among women with CAD, intercourse avoidance is more frequent among patients who are older, and among patients with higher depressive symptoms and somatic comorbidities.

Although there are studies on intercourse avoidance among patients with cancer [44], psychiatric and psychosomatic disorders [45], Alzheimer's disease [46], traumatic brain injury [47] and rheumatoid arthritis [48], there are not many similar studies among female patients with CAD. There are also reports on rates and predictors of intercourse avoidance among healthy [49,50] and pregnant [51] women. Several of these studies support our findings about positive association between age and intercourse avoidance [44,49,50].

Instead of limiting the sample to patients without diabetes mellitus, obesity, psychological disorders, and sleep apnea, we measured comorbid conditions in the sample. This enabled us to document an association between somatic

comorbidities (OR = 1.137) and depressive symptoms (OR = 1.150) and avoidance of sexual intercourse.

Somatic comorbidities were considered to be an important factor contributing to intercourse avoidance. Previous studies have documented a strong association between chronic conditions such as diabetes, stroke, rheumatoid and neurological conditions on sexual function in general and frequency of intercourse more specifically [52–54]. An earlier investigation, however, failed to show an association between somatic comorbidities and sexual fear among patients with CAD [55].

In line with our study which showed an association between higher somatic comorbidities and intercourse avoidance, a recent review has shown that intercourse, and not other sexual activities, is associated with better physical and mental health in both sexes [46]. Some previous studies have also shown an association between frequency of intercourse and some physical health measures including heart rate variability and blood pressure response to stress [56–58].

In our study among female patients with CAD, symptoms of depression were positively associated with intercourse avoidance. In one study, depression rather than anxiety was associated with fear of sexual intercourse among patients with CAD [55]. Similarly, in patients with psychiatric and psychosomatic disorders, depressed individuals reported fewer coital frequencies [45]. Another study on middle-aged men reported depression as the main contributor to sexual avoidance among patients with myocardial infarction [59]. There are, however, studies suggesting that depression and other mental health factors may not play a major role on sexual activity of patients [50,60].

Our bivariate analysis also showed that dyadic satisfaction was lower among patients who had avoided sexual intercourse. Higher frequency of sexual intercourse with a partner may be associated with better dyadic adjustment [50]. Poor dyadic adjustment has been shown to be associated with fear of sexual intercourse among patients with CAD [55].

In line with previous studies [61], our bivariate analysis suggested an association between fatigue and physical function and frequency of sexual intercourse among female patients with CAD. There are, however, studies suggesting that fatigue and physical function may have minimal effect on frequency of intercourse in certain populations [38].

The study may have important clinical implications for cardiologists and other health care pro-

viders who have patients with CAD. Clinicians should ask their female patients with CAD about their specific concerns about sexual behaviors. Possible concerns about negative health effects of sex may contribute to impaired sexual function among patients [6,8–10]. Physicians, nurses and sex therapists who visit CAD patients should also consider educating patients and their partners about safety and timing of return to sexual activity after cardiac events [1,7]. The American Heart Association scientific statement can be consulted in this regard [7]. Other possible reasons such as pain, and body image that may hinder people from a normal and active sexual life should also be discussed. In the case of stable CAD, patients should be clearly and directly reassured that they can enjoy an active sexual life [1]. Such a message should be communicated directly and clearly to all patients with CAD [11]. As sexual function is essential for maintaining well-being [3], this approach may enhance the quality of life of the patients.

#### Limitations

Our study had several limitations. The study abounds in medical nonsexual tools (WHO Rose Questionnaire, VAS, Ifudu Index, HADS, R-DAS), while the only specific sexual instrument that was used is the RSS. Sexual dysfunctions—which are major contributors of sexual behaviors [62]—were not measured in this study. Sexual desire among patients was not taken into consideration, as well. Thus, although the current study assessed several potential nonsexual clinical data (angina grade, cigarette smoking, body mass index, chronic obstructive pulmonary disease, hypertension, cardiovascular accidents, hyperlipidemia, diabetes, anxiety, depression, somatic comorbidities, dyadic adjustment, fatigue and physical function) as possible predictors of intercourse avoidance, the study is limited in covering fundamental psycho-physiological elements of sexuality (e.g., libido and sexual arousal). Libido can potentially influence frequency of intercourse. Through physiological sexual mechanisms, sexual arousal (or contrary, sexual dysfunction) is known to influence frequency of intercourse. Previous studies have shown that female patients with CAD may have distinct sexual dysfunction compared with healthy controls [63,64]. Thus, future research in this area should study possible effects of sexual dysfunction and libido on frequency of intercourse among patients with CAD.

Using the WHO angina questionnaire instead of angiographic findings as a possible predictor is also another limitation. Results of the WHO Rose angina questionnaire (used in this study) have been shown to be correlated with angiographic findings [65]. In addition, controls were conveniently sampled, and this should be considered as another shortcoming. This study also did not take the post or peri-menopausal state, or HRT into account. Thus, there were possible confounders such as alteration of hormones that were not measured in this study. It should be added that using different cut points and time intervals while defining sexual avoidance may lead to various results. While previous studies have assessed the frequency of intercourse in a 1-month period, certain investigations have also evaluated the condition in a 2-week period, similar to that used in our study [66–68]. Finally, the 2-week study period is a relatively short time to make inferences about sexual behavior of our samples. The study could benefit from a before-after design. Although avoidance from sexual intercourse is not sexual dysfunction [68], it is an indicator of poor sexual life satisfaction [69,70]. Intercourse frequency is positively associated with sexual satisfaction [71]. Intercourse avoidance is known as an indicator of disturbance in sexual life [2]. One of the strengths of our study was that several measures such as psychological symptoms, somatic comorbidities, and dyadic relation were included [72,73].

## Conclusion

Our study suggests that women with CAD may more frequently avoid intercourse compared with their healthy matched controls. Intercourse avoidance may be more common among female CAD patients who are older, have high depressive symptoms and also somatic comorbidities. As literature confirms that intercourse is safe among patients with stable CAD, patients should receive health communication messages about the safety of sexual activity among CAD patients. Physicians and other health care providers should consider ways that sexual health can be promoted to their female patients with CAD, especially those who are older, and those who have higher depressive symptoms or multiple comorbidities. Further research should test if such strategies allay patients' fear about sexual functioning.

**Corresponding Author:** Shervin Assari, MD, MPH, Department of Health Behavior and Health Education

and Center for Research on Ethnicity, Culture and Health (CRECH), University of Michigan School of Public Health, 1415 Washington Heights, 2847-SPH I, Ann Arbor, MI 48109-2029, USA. Tel: (734) 647-7944; Fax: (734) 763-9265; E-mail: assari@umich.edu

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## Statement of Authorship

### Category 1

#### (a) Conception and Design

Shervin Assari

#### (b) Acquisition of Data

Shervin Assari

#### (c) Analysis and Interpretation of Data

Shervin Assari

### Category 2

#### (a) Drafting the Article

Shervin Assari

#### (b) Revising It for Intellectual Content

Shervin Assari

### Category 3

#### (a) Final Approval of the Completed Article

Shervin Assari

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#### Appendix Relationship and sexuality scale [37]

1	Negative effect of disease on sexual life	Not at all	Slightly	Rather much	Much	Very much
2	Effect of disease on sexual desire	Increased	No change	Decreased	All gone	
3	Effect of treatment on sexual desire	Increased	No change	Decreased	All gone	
4	Satisfaction with frequency of hugs and kisses	Not at all	Slightly	Rather much	Much	Very much
5	Fear of sexual intercourse	Never	Rarely	Sometimes	Often	Always
6	Perceived fear of partner for sexual intercourse	Never	Rarely	Sometimes	Often	Always
7	Frequency of sexual intercourse relative to level before disease diagnosed	Increased a lot	Somewhat increased	No change	Somewhat decreased	
8	Ability to reach orgasm relative to that before disease diagnosed	Increased a lot	Somewhat increased	No change	Somewhat decreased	
9	Satisfaction with your intercourse	Not at all	Slightly	Rather much	Much	Very much
10	Frequency of sexual intercourse in last 2 weeks	None	Once	Twice	Three times	Four or more