

Sexual Activity After Myocardial Infarction: Systematic Review

Miyokard İnfarktüsü Sonrası Cinsel Aktivite: Sistematik İnceleme

Ozlem DOGU¹ | Hatice KAYA²

ABSTRACT

Objective: This systematic review was planned in order to explore the sexual activity which happen after myocardial infarction by reviewing studies were conducted on this subject, provide clues which can guide treatment.

Method: In the collection of data, CINAHL Plus, Cochrane, Science Direct, Pubmed, Ovid and Google Scholar data bass were used. PICOS question was used to elicit insight into current body of evidence. In the study total of article, which was published in last 11 years in English language and examine sexual functions after myocardial infarction, were chosen. The full text versions of the articles are available in English. In the study, limited articles related to affection of sexual activity after myocardial infarction were obtained.

Results: It was determined that case studies which were conducted experimentally randomized and nonrandomized controlled and definitive-relationship seeker-analytic research designs were used. In the studies, it was reported that individuals who were observed 3-24. months after myocardial infarction, experiences issues such as; relapse of myocardial infarction, experiencing pain, fear of death, lack of sexual interest, drug used, decrease in sexual satisfaction and frequency of sexual activity.

Usage in Practice: Positive effects of provided guidance/consulting and rehabilitation services before and after discharge on coping with sexual problems were determined. In this period, it is required that health professionals should be able to evaluate the sexual status of patient with cardiovascular disease in order to provide care for them so that they can take necessary actions for their well-being, caring and consulting services must be planned.

Keywords: Counseling, Education, Sexual health, Sexual behavior, Myocardial injury

ÖZET

Amaç: Bu sistematik derleme, miyokard enfaktüsü sonrası cinsel aktivite konusu ile ilgili yapılan çalışmalarını inceleyerek, MI sonrası dönemde yaşanan cinsel sorunları ortaya çıkarmak, bakım ve tedaviye rehberlik edecek ipuçlarını sunmak amacıyla planlanmıştır.

Yöntem: Verilerin toplanmasında CINAHL Plus, Cochrane, Science Direct, Pubmed, Ovid ve Google Scholar veri tabanları kullanılmıştır. PICOS sorusu (Population, Intervention, Compariso, Outcome, Study design) mevcut kanıtlara ilişkin aşatırma yönünü ortaya çıkarmak için kullanıldı. Çalışmada, son 11 yıl süresince İngilizce dilinde yayınlanan ve miyokard enfarktüsü sonrası cinsel işlevleri inceleyen makaleler seçilmiştir. Makalelerin tam metni mevcut olan İngilizce çalışmalar araltırmaya dahil edilmiştir. Çalışmada miyokard enfarktüsü sonrası cinsel aktivitenin etkilenmesi ile ilgili sınırlı sayıda makale olduğu gözlenmiştir.

Bulgular: Bu çalışmalarda, randomize kontrollü ve non randomize kontrollü yapılan deneysel tasarımda ve tanımlayıcı-ilişki arayıcı-analitik nitelikte ki araştırma tasarımlarının kullanıldığı saptandı. Yapılan çalışmalarda bireylerin miyokard enfarktüsü sonrası üç-24. aya kadar; miyokard enfarktüsünün tekrarı, ağrı yaşama, ölüm korkusu, cinsel ilgi eksikliği, kullanılan ilaçlar nedeniyle cinsel tatmin ve cinsel aktivite sıklığında azalma yaşadıkları bildirilmiştir.

Uygulamada Kullanım: Taburculuk öncesi ve sonrası verilen rehberlik/danışmanlık ve rehabilitasyon hizmetlerinin cinsel sorunlarla baş etme üzerine olumlu etkileri saptanmıştır. Bu dönemde sağlık profesyonellerinin kalp damar hastalığı olan hastaların bakımında, cinsel durumlarını değerlendirebilmeleri ve sağlıkları için gerekli önlemleri alabilmelerinde danışmanlık hizmetlerini planlanması gerekmektedir.

Anahtar Kelimeler: Danışmanlık, Eğitim, Cinsel sağlık, Cinsel davranış, Miyokard yaralanması

¹Asst.Prof, Faculty of Health Sciences, Division Of Nursing, Department Of Fundamentals, Sakarya University, Sakarya, Turkey, Orcid- ID: 0000-0003-1257-2551

² Prof. PhD, Faculty of Nursing, Department Of Fundamentals, Istanbul University, Florance Nightingale, Istanbul, Turkey, Orcid- ID: 0000-0002-8427-0125

Corresponding Author: Ozlem DOGU, Faculty of Health Sciences, Division Of Nursing, Department Of Fundamentals, Sakarya University, Sakarya, Turkey, e-mail: ozlemdogu@sakarya.edu.tr

Citation: Dogu, O., Kaya, H. (2022). Sexual Activity After Myocardial Infarction: Systematic Review. Journal of Current Nursing Research, 2(2),70-83.

INTRODUCTION

Myocardial Infarction (MI) occurs due to a blockage in the blood vessels by rupture of plaques in heart-feeding arteries and a decrease in the flow of blood to the heart. Myocardial infarction is a cardiovascular system disease that has the highest incidence rate even among the young generation, which results in high mortality rates (Boyde et al., 2014; Phillips, 2014; Uysal & Özcan, 2011). A sedentary lifestyle, poor nutritional habits and increase of obesity among young people have increased the incidence rate of the disease in recent years. In fact, the disease has been accepted as an important health problem due to its complications after acute period that negatively affect the life quality of the patient. The most common symptoms and findings of MI that occur after the necrosis of heart muscle are persistent chest pain that has the possibility to spread into the neck, back or arms, sweating, nausea, vomiting, weakness, palpitation, respiratory distress, dizziness and fear of death (Çamcı & Can, 2014; Çayır & Çevik Akylı 2014; Doğu et al., 2015).

Sexual activity is a natural and indispensable element of a healthy life, which ensures the continuity of human race. Sexuality is an aspect of human life that includes the need for love and belongingness, which stands at the third level of Abraham Maslow's hierarchy of needs (Çamcı & Can, 2014).

Psychological or other reactions of the body to the existence of disease, which are developed against the treatment may cause sexual dysfunction in the patient. Chronic illnesses and myocardial infarction are among the fundamental diseases (Haymana & Worel, 2014; Uysal & Özcan, 2011). Painful event, anxiety, desperation and fear of death experienced after MI may cause psychological and physiological problems and difficulties in individuals' daily life. Consequently, people may return to the hospital with uncertain and serious complications. Besides, people may feel fear or lack of affection, which can lead to the sexual dysfunction (Cossette et al., 2012; Fors et al., 2014; Sevinç & Eşer, 2011).

A study revealed that the individuals, especially men who have experienced MI before, may suffer from erectile dysfunction, low testosterone and premature ejaculation in their sexual life (Abramsohn et al., 2013). In addition, it is an accepted fact that sexual activity itself may trigger MI and cause infarction, although the risk is extremely low (<1%) (Kriston et al., 2010; Muller, 1999). Ischaemia of the heart that occurs during the sexual activity is related to an increase in heart rate which is caused by stimulation of the sympathetic system and can be treated with regular medication (Beta-blocker agents etc.), rehabilitation and revascularization (Rasmussen, 2015). In the study, limited articles related to affection of sexual activity after myocardial infarction were obtained. No systematic reviews were found in the literature. Therefore, in this review, it was aimed to bring these studies together and share their results.

METHODS

Aim

In this context, the aim of this study was to conduct a literature review on the experienced related to sexual activity after MI and present tangible data that will guide the training and counseling therapy.

Design

A literature review was done by using a systematic approach. Sackett et al. framework PICO was used to elicit insight into the current body of evidence (Aveyard 2014). PICOS question (Population, Intervention, Comparison, Outcome, Study design)

- Patient and problem, Post myocardial infarction adult, post myocardial injury, after heart attack,
- Intervention and treatment, sexual education and counseling,
- Comperative intervention, usual care,
- Outcome, sexual dysfunction or sexual activity,
- Study design, Randomized controlled, nonrandomized controlled studies, definite, qualitative and longitudinal studies.

Search strategy

Scanning was carried out by researchers in CINAHL Plus, Ebsco, Science Direct, Pubmed, Ovid and Google Scholar database using the keywords "sexual function", "sexual dysfunction", "myocardial infarction", "post myocardial injury", "myocardial ischemia", "heart injury", "sexual behavior", and "sexual health", "education", "counseling", "sexual counselling" "rehabilitation" in 2021. The total of 113 articles published in the last 11 years between 2010- 2021 were chosen to examine the sexual functions after MI (to reach recent publication). Studies concerning post MI patients published in English in peer-reviewed journals between dates were included in the study, while studies in languages other than English and those concerning other heart diseases were excluded.

Search results

Cochrane data collection form and PRISMA documented the type of study design, participants, country of origin, content of the intervention, intervention period, and outcomes. After determining the PICOS question, which are used as the quality assessment tools in the study, 18 different studies that fulfill the criteria of research were included in the sample (Figure1).

Quality and bias evaluation

The collected data were evaluated according to the standard "Data Summarization Form" which is developed for summarizing the data. Summary subjective judgment of the studies was also valued for the final quality assessment with form. The articles included in the study were summarized independently by different researchers. For proper quality assessment of the articles included in the study we set the parameters. Then, the scores were compared and accordingly, the researchers made a consensus among themselves. The data summary on form included the type of research, the number of samples and the types of the problems that occurred related to sexual activity after MI, the effective factors, and the

suggestions. Since this systematic review consists of the measurement methods and the types of different research, the obtained data was presented without a meta-analysis.

Synthesis

A standard data evaluation form was created by the authors to summarize the data and the data were evaluated according to this form (Table1).

RESULTS

This systematic review included 18 studies published between the years of 2010-2021. Type, sample features, findings and results of the investigated studies are indicated in Table 1. These 18 studies consist of 2 randomized and 1 non-randomized experimental study, 3 observational/descriptive/analytical, 5 qualitative, 4 prospective/retrospective and 2 longitudinal study. Two researchers analyzed the article data separately and bias was tried to be prevented.

The data of six qualitative studies were collected using a semi-structured interview form with which they determined the patients who had MI in the last year by asking via phone or face-to-face interview. In these interviews, most of the individuals stated that they were afraid of experiencing pain in some positions while having a sexual intercourse after MI. In addition, they cannot satisfy the expectations of their wives due to a decrease in their sexual desire. Furthermore, some of the patients specified that they wanted to have information regarding their sexual life before they were discharged from the hospital. However, they were shy to ask questions about the subject. At the end of the research, training of individuals and importance of counseling were emphasized and the importance of updating the training programs were indicated by paying regard to the privacy and security during the period of cardiac rehabilitation (Abramsohn et al., 2013; Arenhall et al. 2011a; Arenhall et al. 2011b; Lopez-Medina et al., 2016; Söderberg et al., 2013).

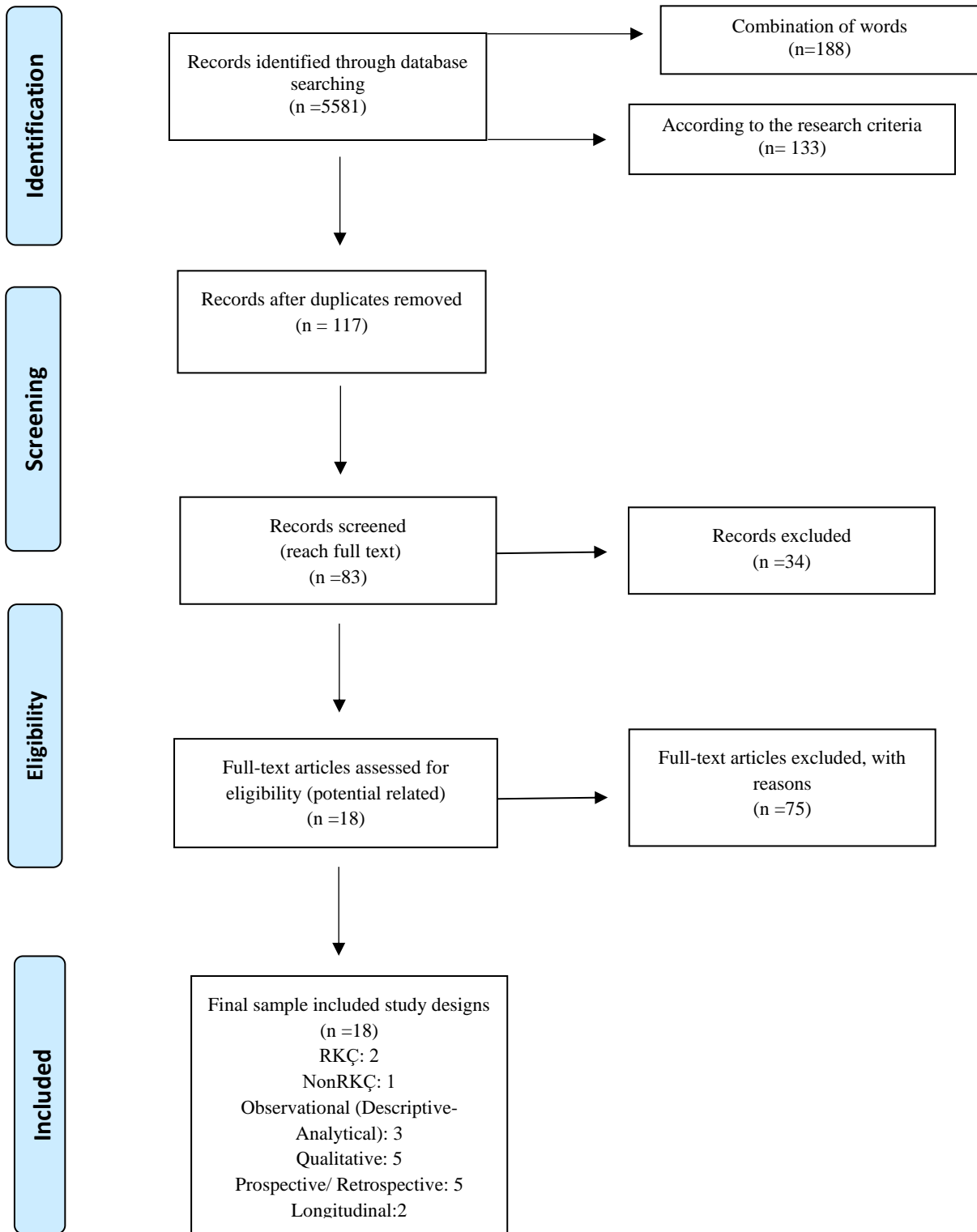


Figure 1. Summary of the data collection

Table 1. Analyses of included articles (by years)

Author\Year	Title of Article	Design of Research	Sample	Method	Study Findings	Suggestions
Kriston et al. 2010	Effect of Sexual Function on Health-Related Quality of Life Mediated by Depressive Symptoms in Cardiac Rehabilitation	Analytical	Average age was 55, rehabilitation total 493 patients	Female and Male erectile dysfunction (ED) Index, data were collected with Hospital Anxiety and Depression Scale and SF-36 scale	It was determined that 43.1% of the women had sexual problems and 20.3% of the men had ED, and the problems of both genders were analyzed in terms of quality of life	It was suggested that the problems related to sexual dysfunction should be included in the rehabilitation program and content should be improved by health professionals
Arenhall et al. 2011a	The male partners' experiences of the intimate relationships after a first myocardial infarction .	Qualitative	The average age of 70 male and 16 male participants who had undergone MI for the first time in last year	The data was gathered by face to face interview in hospital and home environment	In the first year, they expressed sexual behavior were afraid sexual activity, had fearful outward appearance and change of sexual role and their peers were not happy	It was recommended that the health care personnel in the primary health care institutions provide support to individuals with their wives
Arenhall et al. 2011b	The female partners' experiences of intimate relationship after a first myocardial infarction	Qualitative	20 female participants with an average of 62 age group who had MI in the last 1 year	The data were collected in a hospital and home environment with a semi-structured form consisting of flexible questions via telephone method.	After MI, women stated that their spouses were under pressure because of their protective behavior, they restricted social and sexual activity, and additionally they also affected their sexual identity.	The experiences of female patients after the first MI may be helpful for the healthcare staff in counseling the patients
Lindau et al. 2012	Patterns and Loss of Sexual Activity in the Year Following Hospitalization for Acute Myocardial Infarction (a United States National Multisite Observational Study	Observational	Between 2005 and 2008, 24 patients were hospitalized for MI, 4,340 individuals	On the 1 st , 6 th and 12 th months after the MI, scale forms collected via telephone,	48% of males and 59% of females were sexually affected after MI, which was found to be related to pre-discharge counseling and mortality	Counseling on post-MI care and sexual activity were recommended

Table 1. Analyzes of included articles (by years)(Continue)

Author\Year	Title of Article	Design of Research	Sample	Method	Study Findings	Suggestions
Abramsohn et al. 2013	“I’m Not Just a Heart, I’m a Whole Person Here”: A Qualitative Study to Improve Sexual Outcomes in Women With Myocardial Infarction	Qualitative	53 MI experienced patients with a mean age of 17	In the 4 weeks following the MI, data was collected by surveys and via phone calls	The study stated that 4 of the women participants did not have any problems, 11 had low sexual desire, 5 had vaginal dryness, 2 had pain and 4 had fear. Individuals reported negative experiences	Education and counseling should be carried out on individual basis and when necessary with emphasis on privacy and confidentiality
Steinke et al. 2013	A Social-Cognitive Sexual Counseling Intervention Post-MI—Development and Pilot Testing	Non Randomized Controlled Study	10 patients with a mean age of 62 years and 3 spouses with a mean age of 53 were included	15 minutes of training videos after discharge, in 2-4 weeks and 6 weeks by email, and 4.6 weekly telephone counseling.	It was determined that 80% of the patients who reported that they had difficulty in sexual activity before training and they had seen the positive effects of training in the 4 th week, and 60% is decreased in the 8 th week	Counseling about psychosocial and sexual activity after MI, educational content should be updated in line with the studies
Puchalski et al. 2013	Sexual dysfunctions in men in the first 9 months after myocardial infarction	Descriptive	62 male patients with a mean age of 55 in the post MI	In the third and sixth months after the MI, the ED Index and the information status were measured with 15 questions	It was seen that there was no significant difference between the third and sixth months when 60% of the individuals were evaluated for erectile dysfunction during 3 months	Regular follow-up and education status are important
Søderberg et al. 2013	Women’s experiences of sexual health after first-time myocardial infarction	Qualitative	Eleven female participants between the ages of 49 and 63 who had at least 4 months after MI	The data were collected using a semi-structured form consisting of flexible questions and interviews in a hospital or home environment	Most of the women stated that they had anxiety and fatigue in their new life after MI, and they had lack of desire or loss of interest for sexual intercourse. Moreover, they lost sincerity and support that they had been waiting for	Cardiac rehabilitation and counseling services need to be considered

Table 1. Analyzes of included articles (by years) (Continue)

Author\Year	Title of Article	Design of Research	Sample	Method	Study Findings	Suggestions
Lindau et al. 2014	Sexual Activity and Counseling in the First Month After Acute Myocardial Infarction (AMI) Among Younger Adults in the United States and Spain: Prospective, Observational Study	Prospective-observation	2349 women in the average age of 48, and 1152 men that having MI	The data were collected face-to-face at the hospital and 1 month later with the scales specified by phone	A third of the women, 90% of the men reported sexual activity problems after MI. It has been found that activity is more affected in young patients aged 25-30 years, which leads to depression and lower quality of life	Counseling after MI is suggested for the healthy continuation of sexual activity
Chung et al. 2015	Erectile Dysfunction is Associated with Subsequent Cardiovascular and Respiratory Mortality in Cohort of 1,436 Chinese Elderly Men	Prospective Cohort	1436 Male patients were followed for 11.5 years in terms of sexual function, mortality and disease status due to different reasons	Participants were categorized as ICD-10. Mortality status was monitored and the presence of disease, narrative, sexual activity and physical activity status were gathered with determined scales	It has been shown that mortality in cardiovascular and respiratory system diseases is related to ED, and ED affects artery structure and arterial filling. ED is a high risk condition for cardiovascular and respiratory diseases	It is suggested that the health professional should take this into consideration in the provision of primary health care services, to orient them accordingly
Xu et al. 2015	The effect of sex counselling in the sexual activity of acute myocardial infarction patients after primary percutaneous coronary intervention	Randomized Controlled Study	240 acute myocardial infarction (AMI) patients who applied percutaneous coronary intervention were randomly divided into a control and a counselling group	Control group given book sex rehabilitation. counselling group given book sex rehabilitation and individual discussions with healthcare providers every month after discharge. Frequency of and satisfaction with sexual activity was evaluated.	Both groups suffered reduced frequency of and satisfaction with sexual activity after AMI but patients experienced shorter times of resuming sexual activity after AMI in the counselling group.	Sexual counselling recommended helpful at encouraging AMI patients to properly resume their ordinary and regular life.

Table 1. Analyzes of included articles (by years) (Continue)

Author\Year	Title of Article	Design of Research	Sample	Method	Study Findings	Suggestions
Begot et al. 2015	A Home-Based Walking Program Improves Erectile Dysfunction in Men With an Acute Myocardial Infarction	Randomized Controlled Study	A total of 86 participants (45 control-41 experimental groups) between the ages of 40-70	The experimental group was gradually upgraded to early mobilization and the control group was given counseling and brochures for educational purposes	While 84% of the control group reported erectile dysfunction, this number was increased by 9% after 30 days of discharge. In the experimental group, it was 83%, decreased by 71% after 30 days and found to be 12%	Physical exercise is recommended to strengthen the endothelial structure, in this way, erectile dysfunction can be prevented.
Lopez-Medina et al. 2016	Patients' Experiences of Sexual Activity Following Myocardial Ischemia	Qualitative	40-82 years 8 to 23 months before MI-10 male-9 female participants	The semi-structured form was collected via telephone.	It has been determined that sexual activity, age groups of >65 are more labeled, they experience reluctance and fear of having a crisis again, and they are not informed about the subject by health professionals.	Nurses were advised to evaluate all the patients on an individual basis to provide training and counseling on the subject.
Lim et al. 2016	The factors associated with sexual recovery in male patients with acute myocardial infarction under phase II cardiac rehabilitation	Retrospective	72 male patients with MI who were referred for cardiac rehabilitation from October 2010–September 2014	The data were collected from medical records and interviews.	34.7% of the 72 subjects showed improved sexual activity after cardiac rehabilitation, 65.3% continued decreased sexual activity status. The aerobic capacity in cardiac rehabilitation was not an independent factor about sexual activity, and other physiological and psychological factors seem to influence sexual activity.	Education about considering and modifying physiological and psychological factors will be useful when educating patients undergoing phase II CR about their return to normal sexual activity after AMI.

Table 1. Analyzes of included articles (by years) (Continue)

Author\Year	Title of Article	Design of Research	Sample	Method	Study Findings	Suggestions
Lindau et al. 2016	Sexual Activity and Function in the Year After an Acute Myocardial Infarction Among Younger Women and Men in the United States and Spain.	Longitudinal and prospective	2802 women and male patients after MI in the United States and Spain.	The data were collected with forms (The Perceived Stress Scale, Patient Health Questionnaire, GRACE Risk Score, Short-Form Health Survey Physical Composite Score) during 1 month, and 1 year after MI.	59.4% of women and just under half 45.7% of men had sexual function problems in the 1 month after AMI, but a significant increase between 1 month and 1 year for both women and men. The present study shows that counseling was a significant.	The modifiable risk factors and improved physician counseling may be important for improving sexual function outcomes after AMI.
Apostolovic et al. 2017	Erectile dysfunction as a predictor of two-year prognosis in acute myocardial infarction	Prospective	80 men patients with AMI aged between 40 to 84 years	The data were collected with form The Sexual Health Inventory for Men in the hospital discharge and after 24 months.	The percentage of patients without erectile dysfunction increased, while the percentage of patients with severe erectile dysfunction significantly decreased after 2 years.	Treatment of erectile dysfunction could improve after AMI, increasing improvement in the quality of life and reguary use of medications.
Arenhall et al. 2018	Decreased sexual function in partners after patients' first-time myocardial infarction	A longitudinal and comparative design	123 patient and partners (87 women and 36 men)	The data were collected sociodemographic and Watts Sexual Function Questionnaire forms two times approximately 4-6 weeks first-time MI and one year after. First data for they were asked to answer the questions regarding sexual function with a focus on the year preceding the MI.	Watts Sexual Function Questionnaire showed a significant decrease MI after. The majority reported that their intercourse frequencies decreased over time and a first-time MI could affect their partners' sexual function.	It is important for nurses and other health personnel to offer information and discussion about sexual functioning with both patients and partners after a first-time MI.

Table 1. Analyzes of included articles (by years) (Continue)

Author\Year	Title of Article	Design of Research	Sample	Method	Study Findings	Suggestions
Steinke et al. 2018	The Influence of Comorbidities, Risk Factors, and Medications on Sexual Activity in Individuals Aged 40 to 59 Years With and Without Cardiac Conditions.	Prospective	1741 patients between the ages of 40 and 59 years.	The data were collected forms with demographic, cardiovascular risk factors data and National Health and Nutrition Examination Survey	Individuals who smoked and used some medications and weight problems reported less sexual activity. Therefore counseling of risk factors, comorbidities, symptoms, and some of medications is important.	Health personnel were advised the need for sexual assessment and counseling of all cardiac patients, early identification of sexual problems, and to support sexual quality of life.

In the randomized controlled study conducted by Begot et al. (2015) they have observed that the physical treatment during the cardiac rehabilitation has affected the sexual activity of the patient. In the study, the experimental group has been instructed to do 2 metabolic equivalent (MET) level physical exercises twice a day as an early mobilization implementation and they continued to do the exercises according to the given program after they were discharged from clinic. On the other hand, the control group is only provided with counseling and training flyers. As a result, the study has revealed that the sedentary lifestyle causes decrease in systematic vascular nitric oxide and leads to erectile dysfunction, whereas physical exercises strengthen the endothelial structure by increasing the blood flow. Thus, releasing of nitric oxide prevents the erectile dysfunction. Therefore, the positive effects of cardiac rehabilitation on the patients with sexual dysfunction have been proved. Similarly, Xu et al. (2015) had sex rehabilitation for patient who have had a heart attack. Control group given book and another group both book and sexual counselling. The study also showed the combination of individual monthly discussions with healthcare providers generated positive in terms of the frequency of, and satisfaction with sexual activity after AMI.

In the nonrandomised controlled trial study, they counselled the same sample group during 2, 4 and 6 weeks before they were discharged and evaluated the before-after sexual activity and life quality of the patients. The results indicated that health professionals must give training and psychological counseling to patients about sexuality, and the couples must join to the program together (Steinke et al., 2013). The literature; the importance of education and counseling is emphasized but it seems that there is not enough working data about the subject.

This systematic review presents 10 planned findings of observational (Lindau et al., 2012), observational and prospective (Lindau et al., 2014), analytical (Kriston et al., 2010), descriptive (Puchalski et al., 2013) and

prospective (Chung et al., 2015; Apostolovic et al., 2017; Steinke et al., 2018), retrospective (Lim et al., 2016), longitudinal (Arenhall et al., 2018; Lindau et al., 2016) studies that indicate individuals' affection status of sexual activity after MI. The studies revealed that most of the individuals' sexual activity had been affected after MI. The data of studies were collected with life quality, sexual health, stress etc. scales, repetitive measurements after MI and studies showed a significant decrease in sexual function. The results of these studies suggest that couples might benefit the most from information and counselling, the health professional involved in post MI care have an important role here. Puchalski et al. (2013) have put forward that one fourth of the individuals have experienced orgasm dysfunction, 60% had a decrease in sexual desire, sexual satisfaction of 70% of the participants decreased after the intercourse and half of them had unsatisfactory relationships in general.

DISCUSSION

After MI, some individuals and peers were very anxious and shy about turning back to their normal life. The people have had lifelong changes after MI. Inadequate knowledge on many subjects may influence people's lives and they may be afraid of recurrence of the heart attack, which later can turn into anxiety. Individuals remained silent about their sexual life because of privacy reasons when they were asked. It's a known that the sexual activity is affected by MI (Abramsohn et al., 2013; Chung et al., 2015; Steinke et al., 2013).

Thus, Lindau et al. (2014) stated that 89% of women and 94% of men abstain from talking to doctor about sexual activity, hardly 12% of women and 19% of men have seen the doctor about this subject. Patients may avoid affection when they find sexual activity dangerous and risky and thus unwilling to have sexual intercourse due to the fear of experiencing the problem again, deterioration in the body, side effects of medication, seriousness of disease and not being able to satisfy their partner (Abramsohn et al., 2013; Kriston et al., 2010;

Lindau et al., 2014). After MI, individuals make big efforts to get used to new life circumstances. The studies show that when the patients do not see any attention towards themselves, sincerity and support, they are affected negatively and experience anxiety and fatigue which affects sexual desires of both partners (Arenhall et al., 2011a; Arenhall et al., 2011b; Lopez-Medina et al., 2016). Therefore, health professionals should support individuals after MI to cope with appropriate approach.

The studies show that sexual activity directly affects the quality of life and counseling after MI is suggested for the healthy continuation of sexual activity. That's why it is important for nurses and other health professionals (Arenhall et al. 2018; Çamcı & Can, 2014; Lopez-Medina et al., 2016). Kristonet al. (2010) determined that 43,1% of women experience sexual problem, 20,3% of men have erectile dysfunction, which consequently affects the life quality of both genders. Similarly, Lindau et al. (2014) found that sexual activity influences the younger patients between the age of 25-30 more than older patients, which may lead to depression and reduce the life quality. Similarly Xu et al. (2015) stated that sexual health is an important aspect of the quality of life and ordinary and regular life. In this direction, the importance of education and counseling has emerged to increase the quality of life and the sustainability of the sexual activity.

Although sexual problems are common in patients with cardiovascular diseases, rehabilitation was not an issue of much attention. To pursue a healthy and safe sexual life after MI, health professionals emphasize the importance of encouraging the patients to report their problems related to sexual activity and to take counseling support for psychological and sexual issues. In this direction, cardiac rehabilitation programs must be applied with an integrated approach and patients' needs must be

determined based on effective communication for them to trust themselves, report their problems, and concerns and be informed enough about their situations (Abramsohn et al., 2013; Doğu et al., 2015; Steinke et al., 2013). The studies are recommended that nurses have an important role in counseling with an interdisciplinary team, therefore, necessary skills and knowledge should be given in undergraduate education (Peñaranda and Pinzón 2022; Arenhall et al. 2018; Çamcı & Can, 2014; Lopez-Medina et al., 2016).

CONCLUSION

Sexuality is a part of life, therefore, the problems related to sexual life have the potential to affect other areas of life and ultimately the life quality in general. After MI, for the follow up of individuals, cardiac rehabilitation programs, individualized training and counseling are important for the patients to experience their life in full potential. Individuals should adjust to the treatment, which is important for determination and control of sexual problems in early period, maintaining the life quality, and providing continuity. Thus, health professionals should be able to evaluate the sexual status of a patient with cardiovascular disease to provide care for them so that they can take necessary actions for their well-being.

Authorship contributions

Idea/concept, writing the article: OD

Supervision/consulting, critical thinking: HK

Design, data collection and processing, analysis / comment, source scanning: OD, HK

Declaration of conflicting interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors disclose not receipt of financial support for the research.

REFERENCES

- 1 Abramsohn, E.M., Decker, C., Garavalia, B., Garavalia, L., Gosch, K., Krumholz, H.M., Spertus, J.A., & Lindau, S.T. (2013). I'm not just a heart, i'm a whole person here, A qualitative study to improve sexual outcomes in women with myocardial infarction. *American Heart Association*, 2, 2-11. Doi:10.1161/JAHA.113.000199.
- 2 Apostolovic, S., Stanojevic, D., Jankovic-Tomasevic, R., Salinger-Martinovic, S., Kostic, T., Perisic, Z. (2017). Erectile dysfunction as a predictor of two-year prognosis in acute myocardial infarction. *Cardiology Journal*, 24 (4), 393–402. Doi:10.5603/CJ.a2017.0006
- 3 Arenhall, E., Eriksson, M., Nilsson, U., Steinke, E.E., and Fridlund, B. (2018). Decreased sexual function in partners after patients' first-time myocardial infarction. *European Journal of Cardiovascular Nursing*, 17(6), 521–526. Doi:10.1177/1474515117751904
- 4 Arenhall, E., Kristofferzon, M.L., Fridlund, B., & Nilsson, U. (2011). The female partners' experiences of intimate relationship after a first myocardial infarction. *Journal of Clinical Nursing*, 20, 1677–1684. Doi:10.1111/j.1365-2702.2010.03312.x.2011-a
- 5 Arenhall, E., Kristofferzon, M.L., Fridlund, B., Malm, D., & Nilsson, U. (2011). The male partners' experiences of the intimate relationships after a first myocardial infarction. The male partners' experiences of the intimate relationships after a first myocardial infarction. *European Journal of Cardiovascular Nursing*, 10, 108–114. Doi:10.1016/j.ejcnurse.2010.05.003-b
- 6 Aveyard H. Doing a literature review in health and social care: A practical guide: McGraw-Hill Education (UK); 2014.
- 7 Begot, I., Peixoto, T.C.A., Gonzaga, L.R.A., Bolzan, D.W., Papa, W., Carvalho, A.C.C., by et al. Guizilini, S. (2015). A home-based walking program improves erectile dysfunction in men with an acute myocardial infarction. *The American Journal of Cardiology*, 115, 571-575. Doi:10.1016/j.amjcard.2014.12.007.
- 8 Boyde, M., Grenfell, K., Cert, K., Brown, R., Bannear, S., Lollback, N., Witt, J., Jiggins, L., & Aitken, L. (2014). What have our patients learnt after being hospitalised for an acutemyocardial infarction? *Australian Critical Care*, 247, 1-6. Doi:10.1016/j.aucc.2014.05.003
- 9 Çamcı, G., & Can, G. (2014). Women's sexual activity following acute myocardial infarction. *Journal of Education and Research in Nursing (HEAD)*, 11(2), 38-44.
- 10 Çayır, M., & Akyıl, R.Ç. (2014). A study of satisfaction with life and health-promoting lifestyle behaviours in patients after myocardial infarction. *Acta Medica Mediterranea*, 30 (1), 261-268.
- 11 Chung, R.Y., Chan, D., Woo, J., Kwok, T., Leung, J.S.L., Lai, F.T.T., & Wong, S.Y.S. (2015). Erectile dysfunction is associated with subsequent cardiovascular and respiratory mortality in cohort of 1,436 chinese elderly men. *International Society for Sexual Medicine*, 12, 1568–1576. Doi: 10.1111/jsm.12918.
- 12 Cossette, S., Frasure-Smith, N., Dupuis, J., Juneau, M., & Guertin, M.C. (2012). Randomized controlled trial of tailored nursing interventions to improve cardiac rehabilitation enrollment. *Nursing Research*, 61(2), 111–120. Doi:10.1097/NNR.0b013e318240dc6b
- 13 Doğu, Ö., Kaya, H., Gündüz, H., & Parlak, Z. (2015). Web Based distance learning suggestion in training and consultation for myocardial infarction patients. *Medical Network Kardiyoloji*, 22(4), 217-22.
- 14 Fors, A., Ulin, K., Cliffordson, C., Ekman, I., & Brink, E. (2014). The Cardiac Self-Efficacy Scale, a useful tool with potential to evaluate person-centred care. *European Journal Of Cardiovascular Nursing*, 1, 1-8. doi, 10.1177/1474515114548622.
- 15 Haymana, L., & Worel, N.J. (2014). Healthy lifestyle behaviors the importance of individual and population approaches. *journal of cardiovascular nursing*, 29(6), 477-478. Doi:10.1097/JCN.0000000000000199
- 16 Lim, S.Y., Sim, D., & Han, J.Y. (2016). The factors associated with sexual recovery in male patients with acute myocardial infarction under phase II cardiac rehabilitation. *Journal of Clinical Nursing*, 25,2827–2834, Doi: 10.1111/jocn.13324
- 17 Lindau, T.S., Abramsohn, E., Gosch, K., Wroblewski, K., Spatz, E.S., Chan, P.S., ... Krumholz, H.M. (2012). Patterns and loss of sexual activity in the year following hospitalization for acute myocardial infarction (a United States national multisite observational study). *The American Journal of Cardiology*, 109,1439–1444. Doi:10.1016/j.amjcard.2012.01.355.
- 18 Lindau, S.T., Abramsohn, E.M, Bueno, H., D'Onofrio, G., Lichtman, J.H., Lorenze, N.P., ... Krumholz, H.M. (2014). Sexual activity and counseling in the first month after acute myocardial infarction (ami) among younger adults in the United States and Spain, prospective, observational study. *Circulation*, 130(25), 2302–2309. Doi:10.1161/CIRCULATIONAHA.114.012709.
- 19 Lindau, S.T., Abramsohn, E., Bueno, H., Krumholz, H.M. (2016). Sexual activity and

- function in the year after an acute myocardial infarction among younger women and men in the United States and Spain. *JAMA Cardiol.* 1(7),754-764. Doi:10.1001/jamacardio.2016.2362
- 20 Lopez-Medina, Í.M., Gil-García, E., Sánchez-Criado, V., & Pancorbo-Hidalgo, P.L. (2016). Patients' Experiences of Sexual Activity Following Myocardial Ischemia. *Clinical Nursing Research*, 25(1), 45–66. Doi: 10.1177/1054773814534440.
- 21 Kriston, L., Günzler, C., Agyemang, A., Bengel, J., & Berner, M.M. (2010). Effect of sexual function on health-related quality of life mediated by depressive symptoms in cardiac rehabilitation, findings of the SPARK project in 493 patients. *The Journal of Sexual Medicine*, 7, 2044–2055. Doi:10.1111/j.1743-6109.2010.01761.x
- 22 Muller, J.E. (1999). Sexual activity as a trigger for cardiovascular events, what is the risk? *The American Journal of Cardiology*, 84, 2-5.
- 23 Peñaranda, C. J. N., & Pinzón, G. A. B. (2022). Relationship between sexuality and acute myocardial infarction from a phenomenological perspective. *Enfermería Global*, 21(2), 124-137. Doi.org/10.6018/eglobal.490281
- 24 Phillips, P. (2014). Telephone follow-up for patients eligible for cardiac rehab, A systematic review. *British Journal of Cardiac Nursing*, 9(4), 186-198. Doi:10.12968/bjca.2014.9.4.186
- 25 Puchalski, B., Szymański, F., Kowalik, R., & Filipiak, K.J. (2013). Sexual dysfunctions in men in the first 9 months after myocardial infarction. *Psychiatria Polska*, 47(5), 811–826.
- 26 Rasmussen, L. (2015). Cardiovascular drugs and erectile dysfunction – a symmetry analysis. *British Journal of Clinical Pharmacology*, 80(5), 1219–1223. Doi:10.1111/bcp.12696
- 27 Sevinç, S., & Eşer, İ. (2011). Secondary preventive attitudes of the patients with myocard infarction. *Istanbul University Florence Nightingale Nursing Journal*, 19(3), 135-144.
- 28 Steinke, E.E., Mosack, V., Hertzog, J., & Wright, D.W. (2013). A social-cognitive sexual counseling intervention post-mi—development and pilot testing. *Perspectives in Psychiatric Care*, 49, 162–170. Doi:10.1111/j.1744-6163.2012.00345.x.
- 29 Steinke, E.E., Mosack, V., Hill, T.J. (2018). The influence of comorbidities, risk factors, and medications on sexual activity in individuals aged 40 to 59 years with and without cardiac conditions. *Journal of Cardiovascular Nursing*, 33(2), 118-125. Doi:10.1097/JCN.0000000000000433
- 30 Søderberg, L.H., Johansen, P.P., Herning, M., & Berg, S.K. (2013). Women's experiences of sexual health after first-time myocardial infarction. *Journal of Clinical Nursing*, 22, 3532–3540. Doi: 10.1111/jocn.12382.
- 31 Uysal, H., & Özcan, Ş. (2011). A Turkish version of Myocardial Infarction Dimensional Assessment Scale (TR-MİDAS), Reliability-validity assesment. *European Journal of Cardiovascular Nursing*, 10, 115-123. Doi:10.1016/j.ejcnurse.2010.05.007
- 32 Xu, F., Ming, Q., & Hou, L. (2015). The effect of sex counselling in the sexual activity of acute myocardial infarction patients after primary percutaneous coronary intervention. *Acta Cardiologica*, 70 (4), 460-464, Doi: 10.1080/AC.70.4.3096894