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SEXUALITY AND CHRONICALLY ILL CLIENTS

Cardiovascular changes resulting from sexual activity and sexual dysfunction after myocardial infarction: integrative review

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Aims and objectives. To identify studies on cardiovascular changes resulting from sexual activity, as well as the occurrence of sexual dysfunction after acute myocardial infarction.

Background. Many patients with acute myocardial infarction experience sexual dysfunction, mainly due to fear of dying and/or of having another heart attack.

Design. The research was an integrative literature review.

Methods. Searched databases included Lilacs, Medline and PubMed, and the following were inclusion criteria: national and international articles published from 2000–2011, written in Portuguese, Spanish or English.

Results. The results indicate that many patients with coronary heart disease experience sexual dysfunction whether from fear of experiencing another acute myocardial infarction or due to the side effects of medication. Studies show there are few cardiovascular changes during sexual activity.

Conclusions. Because sexual dysfunction negatively affects the lives of people, providing guidance to individuals with cardiovascular disease, especially after an acute myocardial infarction, may be a crucial factor in determining quality of life and should be incorporated into clinical practice.

Relevance to clinical practice. Despite the subject's importance, there are few studies on nursing guidance concerning sexual activity; moreover, addressing sexuality with patients is still a challenge for nurses.

Key words: acute myocardial infarction, nursing, sexual counselling

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Introduction

Current technological advancements and also advancements in medication enable a significant increase in life expectancy, which in turn leads to an increased prevalence of chronic diseases that accompany the ageing process (Dantas *et al.* 2001). Ageing changes the population's quantitative and qualitative sexual performance for men and women. Erectile dysfunction is an increasingly common complaint observed in physician offices and outpatient clinics (Stein & Hohmann 2006). Many risk factors for heart disease such as age, diabetes mellitus, hypertension, dyslipidemia, depression and anxiety are considered predictors of erectile dysfunction, while sexual dysfunction is usually diagnosed during the hospitalisation of patients with acute myocardial infarction (AMI) (Vacanti & Caramelli 2005, Byrne *et al.* 2010).

The importance of sexual health for quality of life has become more evident nowadays (Edwards & Coleman 2004). Sexual dysfunction can have negative effects on emotional aspects and interpersonal relationships (Laumann *et al.* 1999). Therefore, nurses should identify the

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occurrence of sexual dysfunction in patients with acute myocardial infarction and be aware of the risks posed by sexual activity for these patients to provide them with appropriate guidance.

Sexual activity is still a taboo, and health workers often do not address the subject because they consider it to be very intimate and private. When the subject is addressed, it is done superficially, not enabling patients to clarify doubts (Lunelli *et al.* 2008, Byrne *et al.* 2010). Studies show that even though nurses are aware of their responsibility to discuss the potential concerns of patients regarding their sexual lives, they feel unprepared and uncomfortable to provide sexual advice (Ozdemir & Akdemir 2009, Jaarsma *et al.* 2010).

Sexual activity can, however, increase one's blood pressure and heart rate, and nurses should be prepared to advise their patients. A study seeking to observe changes in blood pressure (BP) and heart rate (HR) during sexual activity for healthy adults showed that BP and HR increase just slightly for a short time and recover their baseline level soon after sexual activity for healthy adults (Xue-Rui *et al.* 2008). In this context, it is paramount to identify the risks sexual activity poses to the cardiovascular system and also to verify the occurrence of sexual dysfunction after an AMI, because these changes can increase oxygen consumption, thus worsening the disease's progression.

The aim of this review was to identify in the literature papers addressing cardiovascular changes during sexual activity, as well as the occurrence of sexual dysfunction after an AMI. The following were the guiding questions: What are the cardiovascular changes resulting from sexual activity? and What is the incidence of sexual dysfunction after an AMI?

Methods

This is an integrative literature review. There is a set of studies already published that allows drawing some conclusions about a given theme. It consists of one of the review methods recommended by evidence-based nursing practice (EBP) because it enables to search, critically evaluate and synthesise evidence available on the studied theme. An integrative literature review is composed of six stages: identification of the problem or question, establishment of inclusion/exclusion criteria, definition of information to be extracted from the selected papers, analysis of information, interpretation of results and presentation (Beya & Nicholl 1998, Whittemore & Knafl 2005).

This review was conducted from June 2010–April 2012 in the LILACS, MEDLINE and PubMed databases, according to the following inclusion criteria: papers including any type of study, written in Portuguese, Spanish or English and published in the last 11 years (2000–2011), related to sexual dysfunction among patients with myocardial infarction and/or to cardiovascular changes resulting from sexual activity.

The searching was carried out with a combination of assigned index (MESH) terms: Myocardial Infarction; Sexual Behavior; Sexual Dysfunctions, Psychological. Two nurses selected together the papers by reading the titles and abstracts of all the papers identified in the databases. Those that did not answer any of the study's guiding questions were excluded.

A total of 165 papers were first identified in the intersection of descriptors, 20 of which were selected and analysed according to identification (authors, authors' background, year, database and periodical) and paper's characteristics (title, objective, study's design, result and conclusion). The papers were then separated and analysed according to information available in the abstracts, with data collection and analysis of the full texts afterwards.

Results

A total of 20 studies were selected, as shown in Table 1. To facilitate analysis and results presentation, the articles were divided into two subgroups: cardiovascular risks of sexual activity and sexual dysfunction after myocardial infarction. Eight studies were about cardiovascular risks of sexual activity (Muller 2000, Stein 2000, Möller *et al.* 2001, Thorson 2003, Cheitlin 2005, Lee *et al.* 2006, Parzeller *et al.* 2006, Chen *et al.* 2009), 10 articles about sexual dysfunction after myocardial infarction (DeBusk *et al.* 2000, Drory *et al.* 2000, Kostis *et al.* 2005, Schwarz & Rodriguez 2005, Vacanti & Caramelli 2005, Jackson *et al.* 2006, Miner 2006, Steinke & Wright 2006, Hardin 2007, Lunelli *et al.* 2008) and two articles about these two topics. These topics will be presented below.

Cardiovascular risks of sexual activity

There are currently few studies verifying the metabolic expenditure for sexual activity with measures of body oxygen consumption (VO_2) and myocardial oxygen consumption (MVO_2), or for cardiovascular changes and cardiac risk (Thorson 2003, Cheitlin 2005, Stein & Hohmann 2006, Chen *et al.* 2009).

The most frequently used clinical measure to assess the energy expenditure of physical activities is the Metabolic Equivalent of Task or simply metabolic equivalent (MET).

Table 1 Papers selected for study (São Paulo 2011)

Author	Aim	Study design/ level of evidence	Methods (sample, setting, primary outcomes measured)
DeBusk *et al.* (2000)	To review the recommendations from the Princeton Consensus Panel for the management of sexual dysfunction in patients with cardiovascular disease.	Literature review/III	An international consensus conference and cardiac risk was convened at Princeton University on 1999 and included expert presentations on specific aspects of the topic. Following the paper presentations, a working group was formed to develop consensus recommendations for the management of sexual dysfunction in patients with cardiovascular disease.
Drory *et al.* (2000)	To determine whether there are gender differences in the quantity and quality of sexual activity after a first myocardial infarction (MI) and in the relationships between selected demographic, medical variables and sexual activity after an MI.	Longitudinal study/II-3	Four hundred sixty-two men and 51 women with a first MI were interviewed once before discharge and again 3–6 months after the MI. Patients' demographic and medical backgrounds and their frequency of and satisfaction with sexual behaviour were obtained from the interviews and from medical charts. Analyses of variance showed that women reported significantly less frequency of and satisfaction with sexual activity than men before and after an MI.
Muller (2000)	To provide quantitative data on sexual activity as a trigger of MI.	Case-crossover study/ II-2	An epidemiological technique called the crossover method was used in a large group of post-MI patients, and the results concerning the role of sexual activity in triggering the onset of an MI were reviewed. These findings were examined within the broader context of daily activities as triggers for the onset of acute cardiovascular disease.
Stein (2000)	To identify, in the literature, the cardiovascular response to sexual activity and the risk of acute cardiac events related to coitus	Literature review/III	Analysis of data on the relation between sexual activity and MI, which showed that sexual intercourse will, in most men, represent only a moderate 'stress' on the heart in terms of the responses that impact myocardial oxygen requirements.
Möller *et al.* (2001)	To investigate sexual activity as a trigger of myocardial infarction and the potential effect of modifying physical fitness.	Crossover study /II-2	All patients with a first episode of nonfatal acute myocardial infarction admitted to coronary care units were eligible, and 699 patients participated in an interview. Only 1·3% of the patients without premonitory symptoms had sexual activity 2 hours before the onset of MI.
Drory (2002)	To analyse epidemiological evidence regarding the health risks (and benefits) of sexual activity in men, as well as guidelines for recognising and managing these risks in clinical practice.	Literature review/III	The review showed that the physiological cost of sexual activity is generally similar to that associated with daily activities or mild to moderate exercise for most middle-aged men, with or without cardiovascular disease.
Lunelli *et al.* (2008)	To describe patient knowledge concerning MI and the recommendations received by them to resume sexual activity	Cross-sectional study/II-3	Cross-sectional study conducted between June and July from 2005. Included patients who were within 60 days post-MI. It applied an instrument related to their knowledge of MI and their expectations about resuming sexual activities after discharge.
Thorson (2003)	To identity data in the literature that support instruction regarding sexual practice for patients with known heart disease.	Literature review/III	The review showed that a significant number of patients will have sexual dysfunction following a diagnosis of cardiovascular disease. Risk stratification based on objective criteria and in particular cases, functional testing, may be useful in counselling patients regarding individual risk.
Cheitlin (2005)	To review the evidence that sexual activity increases myocardial oxygen demand only modestly and for a brief period.	Literature review/III	The research revealed that sexual intercourse increases total body oxygen consumption to a modest extent, and this increase lasts only for a brief period. The small increase in the incidence of myocardial infarction that accompanies sexual activity within 2 hours of onset is likely related to sympathetic activation and to an increase in myocardial oxygen demand.

Table 1 (Continued)

Author	Aim	Study design/ level of evidence	Methods (sample, setting, primary outcomes measured)
Kostis *et al.* (2005)	To corroborate and clarify the algorithm from The Second Princeton Consensus Conference and emphasise the importance of risk factor evaluation and management for all patients with erectile dysfunction.	Integrative literature review/III	The panel reviewed recent safety and drug interaction data for 3 phosphodiesterase (PDE) 5 inhibitors, with an emphasis on the safety of these agents in men with erectile dysfunction and concomitant cardiovascular disease. Special management recommendations for patients taking PDE inhibitors who arrive at emergency departments and in other medical situations are described.
Schwarz and Rodriguez (2005)	To verify the relation between erectile dysfunction and cardiac disease	Integrative literature review/III	The findings showed that certain risk factors are common to the development of coronary artery disease and erectile dysfunction; additionally, the use of some medications might eventually cause, but more likely worsen, cardiovascular problems
Vacanti and Caramelli (2005)	To identify the associated variables of erectile dysfunction (ED) in postmyocardial infarction patients without previous sexual dysfunction	Transversal study/II-2	The patient cohort comprised male patients, ranging from 18 –75 year of age definitely meeting criteria for MI and no previous sexual dysfunction. An abridged five-item version of the 15-item International Index of Erectile Dysfunction was answered before discharge. Of 37 patients, 15 (40%) had ED. Patients significantly reduced the frequency of coitus ($p < 0{\cdot}05$). Of nine patients with distress, eight presented ED, and of 28 patients without distress, seven presented ED (89 vs. 25%, $p = 0{\cdot}001$).
Jackson *et al.* (2006)	To update the recommendations based on the expanding knowledge base and new treatments available.	Literature review/III	A consensus panel of experts reviewed recent multinational studies in safety and drug interaction data for three PDE-5 inhibitors (sildenafil, taladafil and vardenafil), with an emphasis on the safety of these agents for men with ED and concomitant cardiovascular disease
Lee *et al.* (2006)	To assess the causes and clinical characteristics of sudden death (SD) related to sexual activity in Korea.	Transversal study/II-2	From August 2001 to November 2005, all autopsies ($n = 1379$) performed at Kyungpook National University were prospectively searched for SD cases related to sexual activity. A complete medicolegal autopsy, including the brain, was performed in every case. In addition, all autopsies were followed by a toxicological analysis for a panel of illicit drugs. Coronary luminal stenosis of > 70% was considered significant.
Miner (2006)	To determine when it is safe to prescribe and use erectogenic drugs after myocardial infarction.	Integrative literature review/III	The analysis shows that post-MI patients should be categorised by risk into low-, intermediate- or high-risk categories following the Second Princeton Panel guidelines. Patients who were categorised in the low-risk category may be safely treated with PDE5 inhibitors after at least 4 weeks following MI.
Parzeller *et al.* (2006)	To provide data about the risk of sudden death based on autopsy findings.	Retrospective epidemio -logical study/II-3	Retrospective follow-up mortality study of natural deaths during sexual activity based on data collected by the Center for Legal Medicine at the Johann Wolfgang Goethe Frankfurt, Germany. Over a period of 33 years (1972–2004), 31,691 autopsies were conducted.
Stein and Hohmann (2006)	To discuss the impact of cardiac disease on sexual activity and sexual dysfunction.	Update study/III	This article discusses the impact of cardiovascular disease on sexual activity, the sexual dysfunction in these patients and the risks of sexual activity for cardiovascular system.

Table 1 (Continued)

Author	Aim	Study design/ level of evidence	Methods (sample, setting, primary outcomes measured)
Steinke and Wright (2006)	To examine the role of sexual satisfaction in reducing anxiety post-MI	Prospective and comparative study/II-2	Patients with acute myocardial infarction recruited from one U.S. medical centre completed questionnaires at their baseline while hospitalised and at 1, 3 and 5 months post-MI. This analysis includes 64 patients compared while at low or high anxiety at 5 months post-MI using sexual satisfaction and selected demographic and clinical variables in the analysis.
Hardin (2007)	To discuss the physiological effects of sexual intercourse on the heart, review the current literature on sexuality on various types of cardiovascular disease and the nurse's role in promoting and maintaining the sexual health of patient's diagnoses with cardiovascular disease.	Literature review/III	The author explains the physiological effects of sexual intercourse on the heart, reviews the current literature about recommendations to the management of sexual dysfunction in cardiac patients and the nurse's role in promoting counselling and education to patients before and after discharge.
Chen *et al.* (2009)	To better understand the cardiovascular effects of sexual activity to help clinicians identity strategies for prevention and offer valuable suggestions.	Integrative literature review/III	The article reviews the literature on various epidemiological, observational, randomised trials and self-reported surveys during the last five decades

One MET refers to the consumption of 3·5 ml of O_2 per body weight kg/minute. For the purpose of comparison, a walk of up to 3·5 km/hour is equivalent to 2 METs, while sexual activity in the preorgasmic phase is 2–3 METs and 3–4 METs during orgasm, although there are individual variations. Compared with the energy spent during a 10 km/hour run, which is approximately 6–7 METs, energy spent during the sexual act may be considered low (Möller *et al.* 2001, Thorson 2003, Stein & Hohmann 2006).

Sexual activity's metabolic cost is small and may be comparable to the energy demanded by routine activities of moderate level such as climbing two flights of stairs (Thorson 2003). Apparently, cardiovascular and metabolic responses in sexual activities are, in most cases, more related to arousal than to physical effort per se, which implies important particularities related to the way cardiovascular tolerance to sex should be evaluated (Stein & Hohmann 2006). Apparently, there are no differences in energy spent during the various types of sexual activity: self-stimulation, partner's stimulation, coitus with man on top or with woman on top, while changes in blood pressure and heart rate correspond to those observed during physical activities with low or moderate energetic expenditure (Cheitlin 2005, Stein & Hohmann 2006).

The most likely mechanism by which the occurrence of a cardiovascular event might be triggered by heavy exercise or sexual activity is the high activation of the sympathetic nervous system, particularly in sedentary individuals (Chen *et al.* 2009). Less physically prepared individuals are at a greater risk of experiencing an AMI after sexual activity, although absolute risk per hour is extremely low, showing that maintaining sexual intercourse once a week has very little impact on the annual risk of suffering an AMI (Möller *et al.* 2001). For patients with coronary atherosclerosis, however, coitus can be compared with heavy exercise and intense emotional responses, which represents a low risk of triggering an AMI (Stein 2000).

Literature shows that cases of sudden death triggered by sexual activities are rare. A study conducted in Berlin between 1972 and 2004 reports that only 68 (0·22%) cases of the 31,691 necropsies of natural deaths occurred during sexual activities (Parzeller *et al.* 2006). A similar study conducted in Korea identified only 14 cases of sudden death during sexual activity in a sample of 1379 necropsies conducted between 2001 and 2005 (Lee *et al.* 2006). Both studies show a prevalence of male individuals having extramarital sex in a nonfamiliar environment (Lee *et al.* 2006, Parzeller *et al.* 2006).

Plausible biological mechanisms through which sexual activity may trigger an AMI include rupture of vulnerable atherosclerotic plaque, coronary vasoconstriction in the presence of endothelial dysfunction, prothrombotic state in early stages, including platelet activation and decline in fibrinolytic activity and prostacyclin release, and increased

myocardial oxygen demand due to the combination of physical and emotional stress (Muller 2000, Drory 2002). Some studies report that arrhythmia is not exacerbated during coitus in most patients, and even though some do present arrhythmia or exacerbated arrhythmia, these are rarely fatal (Drory 2002).

The risk of triggering an AMI or arrhythmia is small if sexual intercourse is practised with a stable partner and in a familiar environment, free of stress and without previous excessive intake of alcohol and food (Drory 2002). Regular exercise has a significant protective effect and reduces the risk of AMI after intercourse. Therefore, exercise should be strongly encouraged at the time of patient's discharge according to the individual characteristics of each patient (Muller 2000).

Sexual dysfunction after acute myocardial infarction

Sexual dysfunction is characterised by the presence of organic or psychological problems that lead to diminished desire or less frequent sexual activity (DeBusk *et al.* 2000, Hardin 2007). Studies show that an AMI has a negative impact on the sexual activity of men and women, although information concerning the causes of sexual dysfunction postinfarction is scarce, especially when patients do not present disorders prior to the coronary event (DeBusk *et al.* 2000, Drory *et al.* 2000).

Many patients with chronic cardiovascular disease experience reduced libido and less frequent intercourse, as well as erectile dysfunction, which are characterised by one's inability to acquire or maintain an appropriate erection in at least 50% of the attempts of sexual intercourse (Drory 2002). One study reports that 40% of the 37 studied patients without previous sexual dysfunction experienced erectile dysfunction in addition to significant reduction in the frequency of sexual intercourses after a coronary event (Vacanti & Caramelli 2005).

Some risk factors, such as diabetes mellitus, hypertension, smoking and dyslipidemia, are common to the development of coronary artery disease, heart failure and erectile dysfunction (Drory 2002, Miner 2006, Lunelli *et al.* 2008). In addition to these factors, virtually all classes of drugs used in the treatment for cardiovascular diseases may affect sexual activity (Miner 2006, Stein & Hohmann 2006).

Sexual dysfunction can trigger psychological changes in patients and their partners, such as fear of sudden death, the risk of experiencing another infarction, postinfarction depression and anxiety caused by recently diagnosed disease (Schwarz & Rodriguez 2005). Additionally, other factors such as dyspnoea, angina, altered libido, age, overprotection on the part of the partner and lack of information concerning real risks arising from sexual practices may negatively influence an individual's sexual life (Lunelli *et al.* 2008). Lack of sexual satisfaction is related to a low-quality relationship with the partner after 1 year after the occurrence of an AMI, showing the importance sexual problems and their evaluation may have in relationships (Steinke & Wright 2006).

Study suggests three step process to stratify cardiovascular risk and patient management: (1) initial evaluation of sexual function incorporated into the cardiovascular evaluation for all men; (2) stabilisation of high-risk patients through cardiovascular treatment before resuming sexual activity or initiating treatment for sexual dysfunction; and (3) evaluation of cardiovascular risks should be performed regularly for patients with erectile dysfunction (Kostis *et al.* 2005).

Organic nitrates (nitroglycerin, isosorbide mononitrate, isosorbide dinitrate), used for treating angina, are absolutely counter-indicated for patients using FDE5 because the combination of these two agents can result in an unpredictable drop in blood pressure accompanied by hypotension symptoms. The American College of Cardiology in association with American Heart Association recommends avoiding the use of nitrates for at least 24 hours after taking a short-duration FDE5 inhibitor and at least 48 hours after taking long-duration FDE5 inhibitors (Schwarz & Rodriguez 2005, Jackson *et al.* 2006).

Discussion

Patients with myocardial infarction may become afraid of resuming daily activities, especially resuming sexual life, after the occurrence of an AMI, fearing that some adverse events such as chest pain, another AMI or even sudden death will occur. Nonetheless, cardiovascular and metabolic responses to sexual activity appear to be more related to arousal than to physical effort (Cheitlin 2005, Stein & Hohmann 2006), and as previously described, the chances of a coronary event and sudden death occurring are extremely small (Möller *et al.* 2001, Lee *et al.* 2006, Parzeller *et al.* 2006).

The main cardiovascular system changes include increased heart rate and blood pressure, while energy spent during sexual intercourse is 3 METs, which can be compared with routine exercise such as climbing two flights of stairs (Stein & Hohmann 2006). The most likely mechanism by which the occurrence of a cardiovascular event might be triggered by heavy exercise or sexual activity is the high activation of the sympathetic nervous system, particularly in

sedentary individuals (Chen *et al.* 2009). In this context, the practice of regular physical exercise should be encouraged according to the characteristics of each patient to reduce these risks during sexual activity (Muller 2000).

Two studies pointed that in male individuals, the risk of cardiovascular events can be associated with more prevalence of having extramarital sex in a nonfamiliar environment (Lee *et al.* 2006, Parzeller *et al.* 2006). Other study corroborates with this dates and concluded that the risk of triggering an AMI or arrhythmia is small if sexual intercourse is practised with a stable partner and in a familiar environment (Drory 2002).

Another aspect that should be considered in these patients is that they often have sexual dysfunction that can be related to fear of having another cardiac event as the use of medications and/or to presence of the other diseases that influence this dysfunction (Drory 2002, Miner 2006, Stein & Hohmann 2006, Lunelli *et al.* 2008). Although there are few studies on sexual dysfunction in patients with acute myocardial infarction, some studies show a negative impact on people's lives, especially when patients do not present disorders prior to the coronary event (DeBusk *et al.* 2000, Drory *et al.* 2000). Study showed that almost half of patients with acute myocardial infarction who do not have sexual changes before the cardiac event decreased sexual activity (Vacanti & Caramelli 2005), which may be related to the fear of the patient and/or the partner of a new cardiac event, dyspnoea, angina and lack of information concerning real risks of sexual activity (Schwarz & Rodriguez 2005).

In this context, nurses have an important role to orient these patients. However, they need to know the risks of sexual activity and the best treatment for patients with myocardial infarction who present any alteration of sexual activity. After a prior evaluation and stratification, health professionals can advise most of their patients who experienced an AMI to resume sexual activities, and many of them can be referred to therapy with medication to treat erectile dysfunction if necessary (Jackson *et al.* 2006). Studies conducted with coronary individuals after an ischaemic event show a considerable prevalence of sexual dysfunction, which includes not only an inability to keep a satisfactory erection but also diminished libido or less frequent sexual intercourse, as well as a fear of dying or of experiencing another infarction. Such fears can be alleviated, provided there is appropriate guidance on the part of health workers (Muller 2000, Dantas *et al.* 2001, Parzeller *et al.* 2006).

Even though studies indicate health professionals are aware of how important sexual life is for patients, as well as the coexistence of coronary disease and sexual dysfunction little has been discussed about the subject in outpatient consultations or during hospitalisations. The problems most commonly reported for this lack of guidance include lack of knowledge, discomfort in addressing the subject and a feeling of invading the privacy of patients, in addition to personal beliefs, attitudes and behaviour (Steinke *et al.* 2011).

Even though sexual counselling has increased over the years, it is still a challenge for nurses to incorporate discussions with their patients in clinical practice concerning sexuality (Katz 2005, Shell 2007, Elias & Ryan 2011). Sexual activity is often addressed when the patient expresses doubts, and generally the discussion on this topic is either interrupted or done only briefly and superficially (Steinke & Swan 2004, Shell 2007).

The fact that professionals do not feel appropriately prepared to address the subject of 'sexuality' with patients reveals the need to emphasise that patients and their partners do not receive appropriate information concerning sexuality, which in turn may generate marital problems, anxiety and other psychological problems, affecting their lives and well-being (Drory *et al.* 2000, Yigit *et al.* 2007, Kong *et al.* 2009).

In this context, there is a need to change concepts, break with taboos and preconceptions. Nurses should recognise the needs and desires of patients to improve their quality of life. Hence, the subject should be addressed in such a way that patients feel comfortable answering questions and clarifying their doubts. A calm and private place is suggested to initiate the talk (Steinke & Swan 2004) because a harmonious and quiet environment makes the discussion on the subject much easier. The talk can begin with questions concerning the individual's health condition, so he realises the importance of honestly answering the questions.

An important point to note is that the discussion of patients' sexual lives should not be based on age because the assumption that older adults do not have an active sexual life is extremely inaccurate. Most adults older than 60 years of age believe that quality of life is reinforced with sexual activity and sexual life is part of a good relationship (DeBusk *et al.* 2000). Therefore, nurses play an important role instructing these patients; thus, they should be apt to discuss the most appropriate way for their patients to maintain sexual activity and also be aware and provide guidance concerning cardiovascular changes during sexual activity and the causes of sexual dysfunctions (Vassiladou *et al.* 2008).

One of the alternatives that may be used to provide guidance concerning sexual activity is the development of manuals and videos on the subject (Steinke & Swan 2004).

We note that NANDA International (2008) presents two nursing diagnoses related to sexuality: ineffective sexuality pattern and sexual dysfunction. Apparently, the diagnosis most applicable to coronary patients is 'sexual dysfunction', even though both diagnoses are related to sexual problems (Silva 2003). Both the diagnosis 'sexual dysfunction' and 'ineffective sexuality patterns' were introduced in the list of diagnoses NANDA-I in the 1980s and revised in 2006, but nurses still find it difficult to implement them in daily practice either because they do not address sexual problems with their patients or because they do not agree with some of the characteristics proposed (Melo *et al*. 2008). Studies addressing diagnoses are rare at both the international and the national levels, especially those conducted with patients with coronary diseases.

This study has some limitations that should be noted. There are few studies in the literature addressing the risks of cardiovascular changes during sexual activity and no clinical trial was found, so further research is needed to confirm these findings.

Conclusion

The relationship between sexual activity and the risk of AMI is one of the great concerns for patients with the disease. Nonetheless, the physical effort generated by sexual intercourse has no great impact on the relative risk of experiencing another coronary event or sudden death.

Many patients present sexual dysfunction after experiencing an AMI, often as an adverse effect of medication, or from fear of dying or experiencing a new AMI. This type of problem, common in both genders, affects the lives of individuals in many ways, compromising their quality of life.

Relevance to clinical practice

Despite the importance of this subject, there are few studies addressing nursing counselling on sexual activity, which still represents a challenge for nurses. Further studies in this specific field are essential to providing nursing professionals the support required for such guidance to be incorporated into clinical practice.

Contributions

Study design: GSB, JLL, ALBLB; data collection and analysis: GSB, JLL, ALBLB and manuscript preparation: GSB, JLL, ALBLB.

Conflict of interest

No conflict of interest exists in the present study.

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