

Sexuality and elderly with chronic diseases: A review of the existing literature

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Background: Increased life expectancy and the growing phenomenon of aging can lead to increased burden of chronic diseases (CDs) which adversely affects the overall health of elderly, their sexuality in particular. Sexual life of an aged population is overlooked in many of the societies. In the present narrative review, we aim to assess the impact of CDs on sexual function of elderly people. **Materials and Methods:** We used internet databases including PubMed, EMBASE, ISI Web of Science, Google Scholar, SID, Iran Medex, Magiran, IPPF, and UNFPA without time limit. Ninety-eight out of 174 relevant articles were selected which met the inclusion criteria: those articles were research-based in English or Persian (original or review articles) and textbooks; specified one or more CDs and sexual function of the cases; elderly people over the age of sixty, men and women; and coordination between articles and research goals. We excluded qualitative and case studies. We reported the most related CDs with sexual function in literature review and used the biological and psychological impact of the CDs on sexual function of elderly population based on the conceptual model of Verschuren *et al.* (2010). **Results:** The results of the studies were classified into the themes including physical, psychological, and cultural and social. Diabetes, cardiovascular, cancerous, and chronic respiratory diseases and also some medications can reduce sexual capacity and desire in particular resulting in negative impact on the quality of elderly sexual life. CDs may influence sexual expressions and responses which adversely affect one's mood and energy so that can cause depression and grief, as well as loss of self-confidence, self-esteem, and self-concept in elderly adults. The factors affecting sexuality of an elderly with CDs include cultural and mythical beliefs about age and illnesses, fear, and embarrassment of changed physical appearance. The research conducted among elderly population examining the adverse influence of CDs on aged people's sexual life in general, sexual function and performance, and intimate interaction. **Conclusion:** It is considered that programs on sexual health needs of aged population for the health-care workers can prove beneficial in improving sexual health.

Key words: Aging, chronic diseases, review, sexuality

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INTRODUCTION

Sexuality is fabric of one's entire life. It is known as the basic human right and a main part of a healthy and inspiring life. Healthy sexuality contributes to improve individual's quality of life (QOL) and the relationship between the spouses.^[1-3] Sexual concerns can cause anxiety in relationships, loss of confidence, depression, lack of commitment to the relationship

with caregiver, and deteriorating the relations.^[4] This is particularly striking in elderly men. Most of the men perceive sexuality as the masculinity, and it can be symbolize superiority. In the societies where men reassert a belief in male dominance in relationships, this will be a source of concern, depression, and anxiety for the elderly men. The best way to prevent these problems is to evaluate their beliefs about the importance of sex to our elderly patients establishing a comfortable sexual relationship and implementing effective treatments.^[5]

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According to the United Nations estimates, the world's elderly population is growing much faster than the overall population as a whole that most of them live in developing countries.^[6,7] Aging is the phenomenon of the 20th and early 21st centuries. It is believed that the mean age of population will increase by 10 years during 2006–2026.^[8] It is expected that the worldwide percentage of people in the age of 65 and over will increase by 17%–82% in European countries while this will be about 200% in some of the developing countries.^[9] Iran population growth is rising so that according to the census of 2011 about 8.24% of Iranian population was elderly. It is estimated that by the year 2021 this will increase to 10%.^[10]

With increasing in the elderly population, developing of chronic diseases (CDs) and their impact on health and QOL is inevitable.^[11–13] According to the WHO, the rate of CDs continues to increase in all countries. Not only more people are affected by these diseases, but life expectancy is also increasing because of rapid preventive health care in the last century.^[11,14] Therefore, an increase in the population of elderly CDs patients with higher life expectancy has caused health-care professionals to shift the focus from issues of survival to improving QOL. Conducting a cross-sectional study on 426 elderly people, Robinson and Molzahn found that the most potent factors associated with QOL of aging ones were satisfaction with personal relationships, followed by health status and sexual activity.^[15] Wang *et al.* in a community-based retrospective study of 412 men and 204 women over 65 years in Taiwan stated that: “lower stress and more daily activities among sexually active elderly ones suggest a connection between sexual activities and higher QOL.”^[16]

Demographic changes in the world have caused an increase in the elderly population and therefore, increase in patients with chronic conditions.^[14] According to the UN General Assembly (2011), the most common CDs include cardiovascular diseases, diabetes, cancers, and chronic respiratory diseases.^[17,18] Aging increases the likelihood of developing one or more CDs.^[19,20] According to the Center for Disease Control and Prevention Report (2011), about 80% of the elderly adults are suffering from one CD and approximately 50% of them are affected by two chronic health conditions.^[19,21,22] In a study by Woo *et al.* on the people of South Korea, it was reported that 46.8% of the aged adults had been diagnosed with comorbidities.^[23]

CDs, including diabetes, arthritis, hypertension, and lung diseases, will threaten the QOL of elderly and lead to loss of independence.^[19,24] In an analytical research by Shahmirzadi *et al.*, (2012) 424 elderly over 60 years were selected using random assignment from citizens of east of Tehran. About 82% of the participants were diagnosed with

more than one disorder that the most common ones were, respectively, arthritis, hypertension, and hyperlipidemia. Being diagnosed with more diseases (especially in women) resulted in a lower score of QOL in physical, psychological, and social domains.^[13,25] The role acceptance was also found to be affected by physical problems.^[25] CDs and their treatment are associated with poor health outcomes and sexual function and on the other hand with an increase in the need for care and rising medical costs.^[22,26,27]

Sexuality plays an important role in individual's identity, role-playing, and interpersonal relations.^[28] Sex and sexuality, particularly in patients with CDs, allow them to feel normality, strong, and liveliness. For debilitated and probably incurable patients who feel no joy in life, not enjoying, working, spouse or parenthood such a physical intimacy will be very important.^[26] Further, the presence of intimacy helps to maintain the relationships.^[29] Besides, developing chronic conditions also can directly (changes in vascular, respiratory, nervous, and hormonal systems) or indirectly (changes in self-image, self-esteem, mood, energy, and pain severity) negatively affect sexual expression and responses.^[26]

Changes in the pattern of disease cause reduction in infectious diseases, lead to increase longevity and thus, increase in chronic disorders. This has drawn much attention to the concept of health and lifestyle over the last few decades.^[11]

In sum, elderly is not considered asexual and this population's sexuality is an important as others. On the other hand, their experience of CDs can affect their sexual lives profoundly.^[28,30] To address healthy sexuality for this population and provide them with sexual-related health care, more and in-depth exploration in this subject matter is necessary. Thus, in this paper, we focus on the impacts of CDs on sexual function of elderly people.

MATERIALS AND METHODS

In compiling this paper, we used academic search engines and internet databases. We found 2265 scientific journals in various databases including PubMed, EMBASE, ISI Web of Science, Google Scholar, SID, Iran Medex, Magiran, IPPF, and UNFPA without time limit and using related keyword phrases including: aging, menopause, CDs, cardiovascular diseases, diabetes, urinary tract diseases, chronic kidney diseases (CKDs), sexuality, inflammatory diseases, respiratory diseases, cancer, and review. Moreover, after reading the topics, 174 relevant articles were identified. During this search, 98 out of 174 relevant articles were selected which met the inclusion criteria: (a) those articles were research based in English or Persian

(original or review articles) and textbooks, (b) specified one or more CDs and sexual function of the cases, (c) elderly people over the age of sixty, men and women, and (d) coordination between articles and research goals. We excluded qualitative and case studies. In this review, we reported the most related CDs with sexual function in literature review. We used the biological and psychological impact of the CDs on sexual function of elderly population based on the conceptual model of Verschuren *et al.* (2010).

RESULTS

Cardiovascular diseases

Hypertension, coronary heart disease, and congestive heart failure can be associated with an increased sexual dysfunction. Erectile dysfunction is seen in 40% of men with hypertension and associated with disease duration. Chronic cardiovascular diseases may be related to pre- or post-sexual symptoms such as erectile dysfunction in men and vaginal dryness in women that appear 1–3 years before angina.^[31] Among women with heart diseases, 25%–63% reported decreased libido, vaginal dryness, dyspareunia, decreased genital sensation, and decreased orgasm. The prevalence of these sexual disorders in men and women with cardiovascular diseases is estimated to be twice more common than general population.^[32]

When giving sex counseling for elderly patients based on a brief list is given in Table 1, should be asked about the

medications they take. Drugs such as beta blockers and diuretics are known to cause loss of libido, erectile, and ejaculation dysfunction. Angiotensin-converting enzyme inhibitors and calcium blockers are not associated with erectile dysfunction and even can have a positive impact on it.^[43,44] Sexual activity in a familiar environment and comfortable room at a suitable temperature with a lifetime sexual partner place the least stress on the heart.^[45] The death rate among the individuals with more orgasms is reported to be about 50% less than ones with lesser orgasm.^[37,42]

Participating in regular sports activities (with doctor’s advice) is the most important principle and successful resumption of sexual activity in the patients with heart diseases. Exercises in the rehabilitation of heart patients will increase heart rate but decrease it during sexual activities and reduces the relative risk of having a heart attack during sexual intercourse.^[46] Physical exercise improves erectile function in men and positively affects the man and his partner’s desire for having sex.^[47]

Diabetes

These diseases have a direct impact on sexual function and health. There is no clear relationship between the physiological decrease in hormones and sexual dysfunction, but findings suggested that hypogonadism, testosterone replacement therapy, and raised prolactin level are associated with decreased libido in two sexes and ejaculation and erectile dysfunction in men.^[11] Due to

Table 1: Sexual counseling for aged patients with cardiovascular diseases

Sexual counseling	Recommendations
Presexual activity assessment	Exercise test should be performed before counseling for the risk of cardiovascular events during sexual activity in patients with mild or stable angina is lower and in ones with unstable and refractory angina is high ^[33,34] Sex counseling for patients diagnosed with coronary artery, angina, and myocardial infarction begins with an initial assessment of cardiovascular risk before patients resume sex. ^[35] Symptoms of chest pain, shortness of breath, rapid heart rate or arrhythmia, dizziness, insomnia after sexual activity, and fatigue the day after sexual activity should be reported to the physician ^[36]
Resuming sexual activity	It is reasonable that the couple uses activities that require less energy expenditure such as hugging, kissing, and fondling. It will allow vital signs to rise gradually and enable them to assess their tolerance for this kind of activity ^[36] Cardiac surgery patients can initiate sexual activity 6-8 weeks after bypass coronary open heart surgery by healing surgical wound ^[37] After cardiac transplantation, if the patient is able to perform mild to moderate levels of physical activity without symptoms, she/he is allowed to initiate sexual activity ^[38]
Coital position	There is no consensus about a certain coital position for patients. According to some studies, the most energy expenditure is with the person on top, and lesser amount of energy is expended by the one on the bottom ^[39] The maximal heart rate and alteration in blood pressure occur during orgasm regardless of position. ^[39] A semi-sitting position is recommended for patients with heart failure ^[40]
Considerations	Sexual activity in an unfamiliar setting with a new partner may significantly increase blood pressure and heart rate resulting in sudden cardiovascular event ^[41] Energy expenditure during intercourse is higher than that of exercises because sex increase energy expenditure and activity that may cause cardiac symptoms ^[37] If a patient experience chest pain with sexual activity nitroglycerine can be taken just before or during sex, if prescribed. ^[36] Mortality rate of male cardiac patients with high sex drives is twice the men with medium or low sexual activity ^[42]

vascular, neurological and physiological changes diabetes, directly and indirectly, affect sexual function. Erectile dysfunction occurs in 50% of diabetic men under 60 years. Furthermore, these patients frequently report decreased libido, impaired ejaculation, and sexual dysfunction.^[11,48] Frigidity, decreased libido, and feeling of inadequacy are common among diabetic women.^[49]

Learning about the illness of the partner may lead to emotional shock. Psychological effects of diagnosis of diabetes on the patient and spouse and its impact on her/his caregiver are more severe than other illnesses.^[50] That imposes additional burden and more family obligation on the spouse of the diabetic person.^[51] This group of patients and their families are vulnerable to the consequences of diabetes that causes sexual dissatisfaction and reduces quality of marital life [Table 2].^[52]

Urinary tract diseases

Genitourinary tract diseases can affect sexual activity, too. Some of these diseases include chronic prostatitis in men and interstitial cystitis in women. Chronic prostatitis is the second most common cause of premature ejaculation.^[53-55] Interstitial cystitis is a chronic vascular condition that presents with frequency, urgency, suprapubic discomfort, and dyspareunia.^[56]

Endocrine disorders are associated with CKDs and can result in sexual dysfunction, decreased libido, erectile dysfunction, dysmenorrhea, irregular menstrual cycles, and infertility.^[57] The incidence of CKD seems to be increasing in elderly people that can be associated with physical impairment.^[58] Changes in prolactin, gonadotropins, and hormones levels, as well as vascular, neurological, and psychiatric factors and medical agents, contribute to sexual dysfunction.^[59] Serum testosterone level of men who are on dialysis has been found to be about two-thirds less than the general population that is likely to occur due to signaling by the luteinizing hormone (LH) inhibitor in the Leydig cells by an increase in LH/follicle-stimulating hormone (FSH). Due to decreased expression of inhibin peptide, feedback inhibition of FSH secreted by Sertoli cells will be disrupted. The risk factors for erectile dysfunction in patients with CKD is to those of cardiovascular disorders including age, diabetes, hypertension, dyslipidemia, smoking,

psychological problems, and anxiety. Increased prolactin production along with reduced kidney clearance is among the reasons for increased prolactin level in both women and men on dialysis.^[60]

The prevalence of erectile dysfunction homogeneous to the rate of end-stage renal failure is 70%–80%.^[60] Kurella *et al.* conducted a longitudinal, cross-sectional study on the relationship between CKDs and physical and sexual performance of menopausal women with coronary heart disease. The researchers assumed that reduced glomerular filtration rate (GFR) is associated with decreased physical and sexual function. Sexual function was assessed using “Sexual Problems Scale of the Medical Outcomes Study.” In this study, there was no significant relationship between GFR and the scale of psychological aspects of sexual function.^[53]

Findings of a survey by Lew-Starowicz and Gellert on sexual activity and sexuality and QOL of 112 hemodialysis individuals confirmed the association between anxiety and depression and sexual dysfunction that negatively affect the patients. In this regard, assessment of QOL suggests study of sexual function as one the key components of psychosocial evaluation of patients with CKD.^[61]

Medication with estrogen-progesterone and androgens along with the treatment of anemia while ensuring adequacy of dialysis, relieving depression, and change in lifestyle will positively affect sexuality and sexual activities.^[60] In other words, management of sexual dysfunction in this group of patients requires a multilateral approach.^[12] There is limited data regarding the use of testosterone in people with the end-stage renal disease (ESRD).^[60] In brief, sexual counseling for elderly patients with urinary tract diseases was reported in Table 3.

Inflammatory bowel diseases

The prevalence of inflammatory bowel diseases (IBDs) is higher among elderly with sexual dysfunction. Psychological issues including fear, worry, and anxiety have a profound impact on developing IBDs. On the other hand, this is a major cause of impaired sexual function as reported in some studies.^[62-64]

Table 2: Sexual counseling for aged patients with diabetes

Sexual counseling	Recommendations
Aims	Sexual counseling through couple therapy method for decreasing side effects of diabetes ^[50] Improving quality of marital life and sexual satisfaction ^[52]
Considerations	In dealing with diabetic ones, physicians should screen patients for sexual disorders through ^[52] Physical examinations Medications they use Initiate medical intervention, if necessary

Table 3: Sexual counseling for aged patients with urinary tract diseases

Sexual counseling	Recommendations
Information regarding sexual function disorder	The most common sexual dysfunction in men with chronic prostatitis is ejaculation dysfunction, premature, and painful ejaculation that may eventually lead to low quality of life ^[53-55] Chronic kidney diseases can result in sexual and erectile dysfunction, decreased libido, dysmenorrhea, irregular menstrual cycles, and infertility ^[57] Women with chronic kidney disease experience menopause symptoms about four points 5 years earlier; thus they report decreased libido, hypoactive sexual desire, and inability to achieve orgasm ^[60]
Multidimensional approach	Sexual function counseling based on psychosocial evaluation of patients for improving quality of life ^[61] Hormone therapy ^[60] Serious sexual education in health-care centers ^[61]
Considerations	According to the findings of several studies: Taking extra testosterone will not improve erectile dysfunction ^[60] Some findings show that in patients with a kidney transplant profile sex drive and frequency of sexual activity improved to 85-90% after normalization of the hormonal serum ^[60]

Evaluating Crohn’s disease and ulcerative colitis, Andrews *et al.* suggested that this is associated with psychological burden decreasing QOL. The symptoms include lack of sexual desire and decreased sexuality in 75% of men and 44% of women and have great impact on sexual aspects of their QOL. Erectile dysfunction (in men) and depression (in both) are among the most important factors in reducing sexual performance. Indeed, most of the IBDs patients show reluctance to sex because of the disease symptoms including flatus and fecal urgency or fear of it and fatigue.^[5]

Rheumatic diseases

Notifying the sexuality of patients with arthritis is of great importance for diagnostic evaluation control of pain and fatigue, treatment and medication management that is often overlooked. All types of arthritis can interfere with daily activities. In this context, sexuality is one of the most important activities still neglected. Fatigue, pain, motor restriction, depression, and loss of self-esteem will have negative impact on sexual life and the person’s ability to enjoy sex.^[65]

Several studies have been done in this field. Some researchers believe that 70%–85% of people over 55 years osteoarthritis. Statistics show that about two-thirds of

patients with osteoarthritis develop sexual problems, while 50% of people with rheumatoid arthritis experience decreased sexual desire, and 60% of them are not satisfied with the quality of their sex life. Moreover, 85% of female and 69% of male patients call developing inflammation in joints as the major obstacles for initiating sex.^[65]

Van Berlo *et al.* carried out a study to compare motivation, sexual activity, satisfaction, and problem of women and men with rheumatoid arthritis with healthy ones in the control group and also to demonstrate correlation between physical aspects of the illness and sexual dysfunction in those patients. The sexual desire and sexual fantasies in (respectively) men and women were less than cases in the control group. The patients in the experimental group did not experience more sexual problems than cases in the control group. Medications influencing ejaculation were correlated with disorder in orgasm. The researchers suggested dependencies between personal and social factors.^[66]

In another study aimed to assess clinical and psychological determinants of sexual disabilities and un-satisfaction in women with rheumatoid arthritis indicated that about 62% of the female participants reported of having troubles in sexual relations; among them, 17% were unable to intercourse. Forty-six percent of the cases reported (respectively) decreased libido and lack of sexual desire. Disability determined using health assessment questionnaire and hip joint involvement was the only determinant of failure. A regression model identified age, pain, and depression as the determinants of lack of sexual desire and satisfaction.^[67]

Studies on sex concerns of patients with rheumatoid revealed that reactivation of latent disease could negatively affect sexual acceptance so that they fail to manage the situation is faced with a serious problem due to depression and reduced self-esteem. Therefore, considering the sexual, mental, and emotional status of this group of patients is of great importance.^[68] We pointed at sexual counseling for elderly patients with rheumatic diseases in Table 4.

Chronic lung diseases

Chronic obstructive pulmonary disease (COPD) and lung cancer are the common progressive lung conditions that are strongly associated with limitations in physical functioning. The symptoms of these diseases include progressive dyspnea, fatigue, anorexia, and malnutrition often due to smoking and long-term exposure to toxic substances and negatively affect sexuality. The global burden of COPD disease will undoubtedly increase due to ongoing exposure to risk factors such as tobacco smoke, environmental stimuli, as well as population aging.^[69]

Sexual dysfunction is highly prevalent among the ones with COPD.^[68] Problems with sexual function can negatively affect sexual satisfaction in these patients and their partners.^[69,70] In the evaluation of the COPD patients, the comorbid conditions such as sexual dysfunction are often overlooked by physicians.^[69,71] In a study by Kaptein *et al.*, male patients reported that they did not discuss their sexual concerns with their physician (87%) or even with their partner (78%). Sexuality is a topic that has rarely been studied in patients with erectile dysfunction following COPD.^[72]

A group of Turkish scholars carried out a study on 70 male COPD patients and 68 healthy volunteers to investigate the incidence of erectile dysfunction and the factors affecting its frequency in this group of patients. Depression was more common among the participants in the COPD group. The correlation between age and erectile dysfunction was documented to be positive in both study groups.^[73]

Then, it is considered that COPD is one of the associated factors for erectile dysfunction [Table 5].^[73-75]

Cancer

Cancer and its treatments can have a complex impact on elderly sexuality. Most of the studies have examined the side effects of cancer treatments on QOL of patients with breast and prostate cancer but have rarely investigated its impact on the genitourinary system.^[76,77] Understanding of sexuality in elderly with cancer requires integration of aging sciences, oncology, and sexology^[76] and their sexual function should be routinely and individually evaluated.^[78]

Evaluation should be performed by a medical team, especially in elderly patients with chronic comorbid condition that is being treated. The effects of disease and its treatment on patient’s perception and cognition and her/his functional capacity can cause signs and symptoms that its effects on sexuality are not necessarily obvious.^[79,80] However, additional technical evaluation is necessary to check the relevance between the diagnosis and sexual dysfunction and dissatisfaction.

Aging and cancer treatment alter the sense of smell, taste, and touch. This can restrict activities that stimulate to initiate sex and to decreased sex drive and libido.^[79]

Health concerns of elderly caused by aging or cancer and its treatment can have a significant effect on sexual motivation, sexual behavior, and sexual pleasure.^[81] For example, halitosis and bad breath after chemotherapy or radiotherapy reduce the interest in sex. Anatomical and sensory changes after surgery or radiotherapy in

Table 4: Sexual counseling for aged patients with rheumatic diseases

Sexual counseling	Recommendations
Information about the relationship between physical and sexual health	Physical health and disease activity in male are more related with sexual problems than in female patients ^[66] Hip joint involvement can affect sexual desire and satisfaction ^[67]
Working with arthritis patients	Newman suggested ^[65] Practicing relaxation techniques once or twice a day and finding a comfortable position for intercourse among the ways for dealing with pain and fatigue There are several books and pamphlets available for sexual intercourse position with minimal pain for patients with arthritis Some general recommendation for this group of people to have satisfactory sex life include: expressing needs and demands with partner, practicing relaxation techniques, fantasizing and imagery, using pain relieving medicines and also warm bath, exercising sex position before coition, changing position during the sex, utilizing alternative ways to express their sexuality, and bringing the partner to orgasm

Table 5: Sexual counseling for aged patients with chronic lung diseases

Sexual counseling	Recommendations
Information about the relationship between chronic lung diseases and sexual function	This systemic inflammatory disorder is associated with decreased libido and increased erectile dysfunction in men Note: Dyspnea and coughing, myasthenia, and decreased physical activity are among the causes of decreased libido these subjects ^[68] Low levels of testosterone and erectile dysfunction are reported in men with COPD, asthma, and obstructive sleep apnea syndrome ^[68]
Consideration	When establishing a treatment plan for improving the pulmonary function of COPD patients, depression and sexual dysfunction should be addressed, too, because they diminish QOL of the patients yet they are usually neglected ^[73-75]

COPD = Chronic obstructive pulmonary disease; QOL = Quality of life

trigger points (for example breasts) can be problematic for individual.^[82] Thus, it is important to consider emotional state including depression of cancerous elderly group for it can be due to pain or disability.^[83]

Living environment and condition have an influence on sexual initiation. Because of cognitive and physical problems due to cancer, many seniors are forced to live in nursing homes that can have a profound impact on sex and sexuality.^[84]

DISCUSSION

The results of the studies were classified into the themes including physical, psychological, and cultural and social. Verschuren *et al.* offered a conceptual framework for understanding the association between chronic illnesses and sexuality which is based on two promises:

- Human sexuality is a complex and multidimensional phenomenon involving biological, psychological, and sociocultural factors
- CD not only accompanied by biological symptoms but also entails psychosocial pressures.

This model shows that physical condition and psychological well-being are the cornerstone of sexual health and are in interaction with each other. Physical condition refers to condition or state of body or bodily function and psychological well-being means autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance.^[1]

Disease activity can directly (erectile dysfunction in men, diagnostic marker of hyperglycemia type 2 diabetes mellitus) or indirectly (the long-term effects of diabetes on the vascular-neural networks of sexual function) affects sexual health and function.^[7] After initiation of disease, some other factors influence sexuality including short-term (hypoesthesia, paresthesia associated with exacerbation of multiple sclerosis) and long-term (diabetic neuropathy and vasculopathy, hormonal disorders associated with late-stage kidney failure) side effects.^[85]

Therefore, any CD that adversely affect arteries (hypertension, heart attack, or congestive heart failure), central or peripheral nervous system (spinal cord injury, multiple sclerosis, and Parkinson's disease), skeletal muscle performance (rheumatoid arthritis and Duchenne muscular dystrophy), and hormones (hypogonadism) will probably have an impact on sexuality, too.^[32] In addition, general consequences of CDs including chronic pain, fatigue, shaking, stiff muscles and cramp, sensory or motor changes, and incontinence of urine and feces will indirectly influence sexual function.^[86,87]

Iatrogenic impacts including medication such as antidepressants and antihypertension drugs, beta blockers, chemotherapy, and radiotherapy side effects can inhibit sex drive while some of them enhance it such as dopamine agonists for treating Parkinson's disease.^[86]

This model describes the potential impact of psychological factors associated with illness and sexual consequences of physical disabilities.^[1] A CD may severely limit a person's ability to get into various positions during sex due to

pain or restriction. Many commonly used drugs to treat CDs affecting mood and energy levels of the patient have negatively impact on sex drive and sexual function.^[26,27,68]

When assessing the sexual health of CDs patients, the relationship between patient and her/his partner should be evaluated. Such a relationship has an important role in coping with illness and consequently with individual psychological health and sexuality.^[1,88] The spouse's emotional reaction to diagnosis the illness and its treatment, procedures and disease progression, and relationship quality (including communication patterns, social skills, and problem-solving) can be supportive or unsupportive (rejection) that interact with emotional performance sexual health of the partners. The process of acceptance of disease by the patient and her/his partner (diagnostic, treatment, progression, and prognosis of the disorder) is the dominant aspect of the psychological health of patients with chronic disorders.^[1,86]

Due to internal or external factors influences individual physical condition and psychological well-being, CDs affect indirectly the sexually of the patient, too. This influence can be temporary or permanent, depending on the underlying cause of sexual dysfunction.^[1,89] Compliance with medical instructions helps to control the unpleasant symptoms of CDs and physical and psychological status changes. According to this conceptual framework, disease activity, compliances, and treatment have direct, indirect, or iatrogenic effects on sexuality.^[1,90]

Chronic physical illness can increase depression, anxiety, and sadness and leads to reduced self-esteem that affects sexual health. These kinds of diseases influence the patient's sexual partner equally through fear, avoidance, loss of libido, fatigue, and role change. Various psychological factors affecting sexualities of elderly with chronic conditions include cultural and mythical beliefs about age and illnesses (elderly patients have no interest in sexual relations), fear, a secondary shame and embarrassment of changed physical appearance due to surgery, amputation, hair loss, colostomy, etc., and role change.^[26,27] These limitations can have a negative impact on sexuality or sexual function and many aspects of the patient's QOL.^[21]

CDs may strength intimacy between couples or cause disintegration of family structure.^[4,91] Communication and social skills play a major role in dealing with diseases.^[91-93] Partners who take care of patient may have a sense of loss and limitation, as well as a lack of sex balance and freedom, and all these may lead to serious marital issues. Findings of the studies on CKD and multiple sclerosis suggest that female caregivers are less likely to feel this way compared to male caregivers affecting the individual and interpersonal relationship and QOL of both spouses.^[91,94] Accordingly,

the findings point to the importance of taking cultural background, values, religion and communication,^[28] and the relation between CDs and sexuality with QOL into account when evaluating the impact of illness on QOL of the case.^[13,95-98]

CONCLUSION

The research conducted among elderly population examining the impact of their CDs on their sexual lives put emphasis on CDs adverse influence on aged people's sexual life in general, sexual function, sexual performance, and intimate relationships or interaction. Sexuality is an important part of a person's self-concept and also is an important factor influencing elderly QOL in particular. Therefore, development of consulting, training, and empowerment programs for seniors with chronic conditions, and also programs on lifestyle and sexual health needs of this population for people working in the health sectors will prove beneficial in improving sexual health. Besides, it would be necessary to carry out qualitative studies on the male and female patients with CDs and also explaining patients' concerns, views, actions, and interactions and perceiving sexual problems in their life, describing the impact of CDs on their marriage or partnership and sexuality and vice versa, and also social reactions within communities with different cultures.

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AUTHORS' CONTRIBUTION

- PR contributed in the conception of the work, conducting the study, drafting and revising the draft, approval of the final version of the manuscript, and agreed for all aspects of the work.
- AP contributed in the conception of the work, conducting the study, drafting and revising the draft, approval of the final version of the manuscript, and agreed for all aspects of the work.
- MY contributed in the conception of the work, conducting the study, drafting and revising the draft, approval of the final version of the manuscript, and agreed for all aspects of the work.
- EMK contributed in the conception of the work, revising the draft, approval of the final version of the manuscript, and agreed for all aspects of the work.

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