

ORIGINAL ARTICLE

Sexual dysfunctions and related variables with sexual function in patients who undergo dialysis for chronic renal failure

Gülseren Keskin¹  | Aysun Babacan Gümüş² | Gülay Taşdemir Yiğitoğlu³

¹Atatürk Health Care Vocational School, Ege University, İzmir, Turkey

²Nursing Department, Health High School, Çanakkale Onsekiz Mart University, Çanakkale, Turkey

³Nursing Department, Health Sciences Faculty, Pamukkale University, Denizli, Turkey

Correspondence

Gülseren Keskin, Atatürk Health Care Vocational School, Ege University, İzmir 35100, Turkey.

Email: gulseren.keskin@ege.edu.tr

Aims and objectives: To evaluate personality characteristics and psychological symptoms believed to have an effect on the sexual functions and performances of patients undergoing dialysis treatment.

Background: Chronic renal failure is a life-threatening condition which can often have a poor prognosis. The loss of vital kidney function and other complications can affect almost all age groups.

Design: A quantitative descriptive study.

Methods: The study sample included 225 patients selected randomly from patients who have undergone dialysis treatment for at least 3 months at a dialysis centre in a university hospital. In this study, the Golombok Rust Inventory of Sexual Satisfaction (GRISS), the Eysenck Personality Inventory (EPI) and the Brief Symptom Inventory (BSI) were used.

Results: In the correlation test, made to investigate the relation between the patients' sexual satisfaction and their personalities, a significant positive relation was found between the communication subscale of the GRISS and the Lie dimension of the EPI, and a significant negative relation was found between the Communication subscale of the GRISS and the Lie dimension of the EPI, and between the Vaginismus and Orgasm subscales of the GRISS and the Extroversion dimension of the EPI.

Conclusion: Results showed that sexual problems, in the areas of nonsensuality, anorgasmia, avoidance and communication, are associated with extroversion and psychological symptoms.

Relevance to clinical practice: Sexual health and the psychological well-being of patients with renal failure is an important issue that should be considered in nursing practice. Nurses should take the psychological problems of patients and their relations with partners into account and consider these problems in a holistic manner within the framework of nursing practice. They would then be able to play an effective role in intervening at an early stage and would be better equipped to help and control the psychological and sexual problems that some patients may experience.

KEYWORDS

characteristics, haemodialysis, liaison nurse, mental health nursing, sexual health

1 | INTRODUCTION

Chronic renal failure (CRF) is a life-threatening disease often with a poor prognosis. Loss of kidney function, which may lead to other health complications, affects all age groups but especially adults (K/DOQI 2007, Kara, 2012). These adult patients account for more than 10% of the world population, and the prevalence of the disease continues to rise at a constant rate. This fact alone confirms how serious and widespread the disease currently is (Eckardt et al., 2013; Türkiye Böbrek Hastalıkları Önleme ve Kontrol Programı 2014). Kidney transplantation and haemodialysis or peritoneal dialysis, both methods which remove waste products and excess fluids from the blood, are used to treat this disease (Schipper et al., 2014).

Dialysis, whether peritoneal or haemodialysis, has a significant effect on patients, both physically and psychosocially. Participating in social activities, work life, maintaining relationships within the family and with friends, and adapting to a new way of life as a result of dialysis can be extremely difficult for some patients (Griva, Jata-sena, Davenport, & Newman, 2010). They find themselves dependent upon a tiresome dialysis procedure and its associated medical care. They are also exposed to other stressful situations such as liquid-diet restriction, medication, frequent illness, sexual dysfunction and possibly job loss. How a patient reacts to the disease process depends on his or her premorbid personality characteristics, the level of environmental support provided and the actual course of the underlying disease. Depression, anxiety disorders, failure to follow the prescribed course of treatment, rehabilitation difficulties and sexual dysfunctions (Akpolat & Utaş, 2016; Charlot & DeRoux, 2009) are all problems that patients often experience.

According to the World Health Organization (WHO), sexuality is influenced by the interaction of physical, emotional, intellectual and social factors which affect personality, communication and love. It is a state of well-being which enables not only physical, but also emotional, intellectual and social integrity, which in turn influence personality development, communication and the sharing of love for a person as a sexual being (WHO, 2010). Sexuality is the source of human existence and is an important part of human life. It affects many aspects of life from birth through to death. Whether one has an active sex life or not, sexuality is a part of daily thoughts and emotions. It can also form the basis of dreams, imagination, fear and anxiety (Kütmeç, 2009). Frustrated sexual function may have a harmful effect on self-confidence and self-esteem and may also have a damaging effect on social and marital relations (Basok et al., 2009). Diabetes, which is one of the main causes of CRF, is associated with sexual dysfunction in both males and females. Sexual dysfunction is more common in males with CRF, and erectile dysfunction is reported in approximately 70%, this rate being considerably higher than amongst the general population. There is little information on how patients who have end-stage renal failure cope with problems such as sexual dysfunction and how it affects their quality of life (Popp et al., 2012). Many conditions such as diabetes, cardiovascular disease, visual impairment, hearing difficulties and deafness,

What does this paper contribute to the wider global clinical community?

- This study investigated sexual problems among dialysis patients with renal failure and factors associated with personality characteristics.
- We found that sexual problems in the domains of non-sensuality, anorgasmia, avoidance and communication and that some of these problems are associated with extroversion and psychological symptoms.
- Sexual function plays an important role in people lives. Many physical or psychological pathology can cause sexual dysfunction. Renal failure causes sexual dysfunction. Sexual dysfunction is common in renal failure in haemodialysis therapy, and often adversely affects patient's quality of life.

immobility, arthritis and cognitive dysfunction may be comorbid with CRF (Giraldi & Kristensen, 2010).

Both organic and metabolic disturbances, and physiological alterations associated with CRF, together with the presence of psychosocial problems which may include changes in intrafamily roles, restrictions of social life, depression and adaptation problems, lead to the development of sexual problems in dialysis patients (Akpolat & Utaş, 2016; Basson, Rees, Wang, Montejo, & Incrocci, 2010; Raggi et al., 2012). Furthermore, drugs used in the treatment of hypertension and depression in these patients often affect erectile function adversely; decrease sexual desire, orgasm capacity and sexual satisfaction; and cause delayed ejaculation in men. In addition, they have negative effects on orgasm capacity, vaginal dryness, reduction in arousal and desire, and dysmenorrhoea in women (Gandaglia et al., 2014; Vecchio et al., 2010).

Erectile dysfunction (ED) is the most commonly reported symptom of both dialysis patients and older patients. Rates as high as 90% have been reported (Al Khallaf, 2010; Finkelstein & Finkelstein, 2014; Naveethan et al., 2010; Pop-Jordanova & Polenakovic, 2013; Vecchio et al., 2010, 2012; Yavuz et al., 2013). In 86% of haemodialysis patients, a decrease in libido has been reported. Similarly, in 52% of haemodialysis patients, delayed or inadequate ejaculation occurs during sexual intercourse. Oligospermia and decreases in sperm motility also frequently occur. In addition, gynaecomastia occurs in around 30% of men (Mustafa & Schmidt, 2015). This problem develops commonly within the first months of dialysis and tends to regress as dialysis is maintained. In a study carried out with male patients undergoing dialysis treatment, it was established that problems such as anorgasmia and decreased sexual desire and satisfaction are quite common (Barroso et al., 2008). In studies carried out with female patients, it was stated that sexual complaints are twice as high compared with the rest of the population (Prescott, Eidemak, Harrison, & Molsted, 2014). In one study, it was determined that sexual dysfunction is present in 66.7% of patients on peritoneal dialysis, 75% of patients on haemodialysis and 50% of patients who had

undergone renal transplantation (Basok et al., 2009). It has also been reported that in women with CRF, a decrease in desire, an increase in vaginal dryness, dissatisfaction and pain during sexual intercourse are observed (Mustafa & Schmidt, 2015). Menstruation disturbances and reproductive problems occur commonly in women with renal failure, and amenorrhoea occurs as soon as women start dialysis. In another study, performed with women who were on haemodialysis and those who underwent kidney transplantation, sexual function, frequency of sexual intercourse and sexual fears were evaluated. It was found that sexual fears were at a lower degree and the rate of sexual intercourse and sexual satisfaction were higher in women who had undergone kidney transplantation compared with those on dialysis. It was also established that sexual performance and interest in sex was seen at a lower rate in haemodialysis patients (Noohi et al., 2010). In a study carried out by Mor et al. (2013), it was reported that there was no sexual activity in 81% of women who were on haemodialysis. In the same study, the causes of sexual inactivity and sexual dissatisfaction were also evaluated. It was established that for 39% of these women, the reason for a lack of sexual activity was the absence of a partner, whereas 43% experienced a loss of interest in sexuality.

Although sexuality is one of the most important stressors in life for patients with CRF, sexual dysfunction in these patients is rarely addressed. Despite the presence of these problems, very few patients discuss them with health workers. Many symptoms of CRF improve with dialysis treatment; however, sexual dysfunction problems persist throughout the treatment process (Navaneethan et al., 2010; Noohi et al., 2010).

It is evident therefore that sexual dysfunction problems are common in patients undergoing dialysis and that there is an adverse effect on their lives. The studies on these patients focus mainly on sexual dysfunction and quality of life (Fernandes et al., 2010; Lim, Liong, Leong, Khan, & Yuen, 2016; Song et al., 2008; Theofilou, 2013), or on anxiety and depression (Esen et al., 2015; Strippoli et al., 2012; Teles et al., 2014; Theofilou, 2012). As discussed before, the physical demands of the dialysis procedure cause patients to experience many problems. It is thought that these problems may display variations depending on the personality characteristics of patients. It is understood that personality characteristics play an important part in an individual's ability to manage a crisis, cope with stress and adjust to disease. Although sexual dysfunction is present in a large number of patients who are on dialysis, the same problems were absent in some of them. It was thought that this may be the result of the varying personality characteristics of the patients. As far as we know, however, no study has been carried out in Turkey to confirm whether personality characteristics have any effect on sexual dysfunction in CRF cases. In a few studies carried out elsewhere, it has been reported that CRF patients with neurotic personality characteristics tend to focus on negative emotions, have a stronger tendency to experience psychological problems and use less adaptive coping methods (Geisler, Wiedig-Allison, & Weber, 2009; Poppe, Crombez, Hanouille, Vogelaers, & Petrovic, 2013; Poppe et al., 2011).

Sexual health and the psychological well-being of patients is an important issue that should be considered in nursing practice.

Therefore, nurses should take the psychological problems of patients and their relations with partners into account and consider these problems in a holistic manner within the framework of nursing practice. Nurses would then be able to play an effective role in intervening and dealing with psychological and sexual problems, which may affect patients in the early stages.

Given these facts, the aim of this study was to evaluate sexual problems in patients undergoing dialysis due to CRF, in terms of personality characteristics and psychological symptoms.

2 | METHOD

2.1 | Subjects

The study sample included 80 patients who were on peritoneal dialysis and 145 patients who were on haemodialysis, selected by a random sampling method from patients who had undergone dialysis treatment for at least 3 months in the dialysis centre of a university hospital. The sampling took place between December 2014–April 2015. Patients were selected using a computer-generated, random-number sequence. Men and women aged 18 years and above who were undergoing long-term haemodialysis between December 2014–April 2015 were eligible. All the patients in the participating clinics were monitored during the course of the haemodialysis treatment.

Patients included in the study were those who underwent regular haemodialysis and peritoneal dialysis treatment. Patients on haemodialysis treatment had dialysis at least three times a week, and each session took 4 hr. The collection of data was performed by interviewing each patient. A detailed explanation of the procedure was given to the patients, and a formal written consent from each participant was obtained.

2.2 | Design

This study used a quantitative descriptive design.

2.3 | Instruments

In this study, the sociodemographic questionnaires Golombok Rust Index of Sexual Satisfaction (GRISS), Eysenck Personality Inventory (EPI) and Brief symptom Inventory (BSI) were given to the patients.

2.4 | Sociodemographic data form

This form is prepared by the investigator and includes questions on sex; age; marital, education and employment status; previous and current diseases; primary kidney disease; their diagnoses and treatment; comorbid diseases; and family histories.

2.5 | Golombok Rust index of Sexual Satisfaction

This scale was developed by Rust and is a short 28-item questionnaire for both men and women. The scale investigates sexual

functions and dysfunctions in seven subscales which include infrequency, communication, dissatisfaction, avoidance, nonsensuality, vaginismus and anorgasmia (premature ejaculation and erectile dysfunction in males). The responses in each category are assessed using a 5-point Likert scale consisting of the choice options of “never,” “rarely,” “sometimes,” “mostly” and “every time.” A high score on a particular item or subscale indicates a greater confirmation of the dysfunction or problem being measured. On the scale, points ranging between 1–9 provide information concerning the severity of sexual dysfunction. In the scale, options that are marked 0–4 are calculated as “0” points, and those that are marked 5 and above are calculated as “1” point. Zero (“0”) indicates that there is no sexual dysfunction, and “1” indicates that there is a sexual dysfunction. The clinical cut-off value differentiating healthy from unhealthy was determined as 5. The overall score obtained gives a general idea about the quality of sexual functions, and the subscale scores provide more detailed information on various aspects of the relations. Higher scores indicate an impairment in sexual functions and quality of relations. The GRISS is used by relationship counsellors and clinics to identify and monitor sexual problems over a 2-week period (Goldstein, Meston, Davis, & Traish, 2006).

In the factor analysis for construct validity, the KMO test was 0.96 and the cumulative variance of the two factors was 86.82%. In the reliability study, the test–retest correlation coefficient = 0.75, and the internal consistency analysis Cronbach's alpha coefficient = 0.98.

Accordingly, after necessary transformations, scores of 5 and above are interpreted as unhealthy and indicate that there is a problem in that subscale. Scores below 5 fall within what is considered to be the healthy range (Tuğrul, Öztan, & Kabakçı, 1993). The GRISS method of assessment is used by relationship counsellors and clinics to identify and monitor sexual problems. The Cronbach alpha value in this study was 0.89.

2.6 | Eysenck Personality Inventory

This evaluates and measures dimensions of personality, such as neuroticism–stability, extroversion–introversion and psychoticism within the framework of Eysenck's personality theory. It has 24 items and four subscales and is a self-report scale with “yes” or “no” response options. The validity and reliability of this approach were carried out in a study in Turkey by Karancı, Dirik, and Yorulmaz (2007), in which the Cronbach alpha inner consistency coefficient for extroversion, neuroticism, psychoticism and lie dimensions was found to be 0.78, 0.65, 0.42 and 0.64, respectively, and the test–retest consistency was 0.84, 0.82, 0.69 and 0.69, respectively (Karancı et al., 2007). The Cronbach's alpha was between 0.65–0.66 for extroversion and 0.74–0.76 for neuroticism, in the three measurements that took place. A low score indicated that a patient was introverted, and a high score indicated that the patient was extroverted. If the score on this scale was higher, then it would suggest that the patient had a tendency to be a very nervous and emotional sort of person. Whereas it does not necessarily mean that person is neurotic, it

does, however, indicate that they are more likely to develop neurotic problems such as phobias, obsession–compulsions and depression compared with someone who has a lower score. Nowadays, low neuroticism is often referred to as emotional instability.

Furthermore, with the Lie subscale, the aim is to prevent any form of bias and in checking the validity of the questionnaire. The subscale raises questions concerning behaviour that may be considered by the participants to be socially or morally wrong even though they are things that most people normally do. It also raises awareness of the need for social acceptability.

2.7 | Brief Symptom Inventory

The reliability and validity of BSI were carried out in a study in Turkey by Şahin and Durak (1994). It evaluated psychological symptoms using five subscales which included anxiety, depression, negative self, somatisation and hostility. The BSI test is a 53-item self-report scale which uses the 5-point Likert scale. The scores range between 0–212. The test can be used to assess adolescents and adults, as well as individuals and groups. High scores obtained from the scale indicate the prevalence of symptoms. It has been suggested that an individual who attains an average score of 2 or more on the subscales may be experiencing problems in that particular area. There are no cut-off points. The Cronbach alpha of this scale ranges from 0.71–0.85. The internal consistency of the Global Severity Index (GSI) was high in both follow-up participants ($\alpha = 0.91$) and inpatients ($\alpha = 0.84$), whereas estimates for the somatisation, anxiety and depression subscales were more variable (α range, 0.61–0.84). In this study, the Cronbach's alpha of the BSI was 0.97. Furthermore, the inner consistency coefficient of the BSI in this particular study was found to be $\alpha = 0.97$ (GSI).

2.7.1 | Global Severity Index

It was obtained by dividing the overall score of the subscales by 53.

2.7.2 | Positive Symptom Total Index (PSTI)

It is the overall score obtained when all items (all positive values) other than those with “0” values are accepted as 1.

2.7.3 | Positive Symptom Distress Index (PSDI)

It is obtained by dividing the overall score of the subscales into symptom scores. When the mean values of these scores approach 4, symptoms become more severe, and when they approach 0, the symptoms lessen.

2.8 | Procedure

This study was carried out on patients who volunteered to participate, and they were selected by the investigator based on specific criteria. The selection process took place during the patients' visits

to a dialysis unit in a university hospital. It took each patient approximately 20 min to answer all the questions on the form.

Of the 250 patients interviewed, 15 were excluded from the study because they failed to complete the rating scales, and five were excluded due to having comorbid neurological diseases. The study was conducted using the remaining 225 patients, of which 110 were female and 115 were male. The criteria for being included in the study were that each patient would undergo dialysis treatment for a minimum of 3 months and that they volunteered to participate. Criteria that excluded patients from taking part in the study were as follows: a history of alcohol and substance abuse, visual, hearing and cognitive loss (based on the standardised mini-mental test) which was considered severe enough to interfere with the filling of scales. In addition, patients with a psychotic disorder, an organic brain disorder or serious physical disease such as peritonitis, recalcitrant congestive heart failure or acute complications of uraemia were also excluded from this study.

In the study, the age of the patients, their marital, education and employment status and their comorbid diseases, primary kidney diseases and the drugs they were using were all documented.

2.9 | Statistical evaluation

The data were evaluated using the SPSS 15.0 for Windows program. In statistical evaluations and to evaluate the relations between categorical variables, a chi-square test was used; to evaluate the difference between means of two groups, a *t* test was used; and to evaluate the difference between mean values of three groups, a one-way analysis of variance (ANOVA) was used. The Pearson correlation analysis was used to determine the direction and degree of the relation between variables. In all statistical analyses, $p < 0.05$ was considered to be statistically significant.

2.10 | Ethical considerations

The study was conducted in accordance with the ethical principles of the 1964 Helsinki Declaration and complied with these standards. (Ethics committee of University Number: 60116787-020-20057) to conduct this study. After the researchers had explained the purpose and content of the study, it was required that all the participants voluntarily agree to take part. However, they were also informed that they were entitled to withdraw from the programme at any time. Furthermore, it was made clear that all of the data collected during the study would remain confidential and anonymous, thereby allowing the participants to confidently complete the study. They all provided written consent to be included in the study.

3 | RESULTS

The mean age of those participating in the study was 42.97 ± 11.81 . 51.1% were male, 77.8% were married, and 25.3% were primary school graduates. There are four stages of education in Turkey—

TABLE 1 Characteristics of respondents ($n = 225$)

Gender	% (N)
Male	51.1 (115)
Female	48.9 (110)
Age	
Mean age	42.97 ± 11.81
Education level	
Elementary school	25.3 (56)
High school	54.5 (122)
College	20.2 (47)
Marital status	
Married	77.8 (175)
Single	10.2 (23)
Divorced	12 (27)
History of a psychiatric disorder	
No	88 (198)
Yes	22 (27)
Time from diagnosis of renal failure	24.97 ± 12.8

preprimary, primary, secondary and higher level. Primary education is mandatory for all children from the age of 5.5 years and is provided free of charge in all government schools. They have a total of 8 years of education (4 + 4) in these schools.

Of the patients involved in the study, 25.3% were in employment and 19.1% were retired, and 48.4% of the patients had undergone haemodialysis treatment for a period of 1–5 years. The primary cause of renal failure in 28% of the patients was found to be hypertension, and in 16.4%, the primary cause was diabetes mellitus. Patients underwent haemodialysis three times a week, and the overall duration of the haemodialysis treatment was 88.6 ± 68.9 months. It was also found that approximately 88.0% of the patients had no history of psychiatric disorder; 22.7% stated that their stress levels increased due to the disease and that they were receiving social support; and 2.2% reported that they needed professional psychiatric help (Table 1).

The study also revealed that the mean scores in nonsensuality (5.98 ± 3.12), anorgasmia (5.51 ± 2.84), avoidance (5.43 ± 2.93) and communication (5.10 ± 2.11) subscales of the GRISS were found to be 5 or higher (Table 2).

3.1 | Sexual dysfunction according to sociodemographic characteristics

When GRISS scores between male and female patients were compared, in the dissatisfaction ($t = 2.55$, $p < 0.05$), nonsensuality ($t = 5.91$, $p < 0.001$) and avoidance ($t = 8.004$, $p < 0.001$) subscales, a significant difference was found between men and women. The women's scores were higher in the dissatisfaction and touch nonsensuality subscales, whereas the men's scores were higher in the avoidance subscale. Whereas dissatisfaction and touch nonsensuality problems were more frequent in females, males were found to have a problem of avoidance (Table 3).

TABLE 2 Mean scores of scales ($n = 225$)

	Mean	SD
Golombok Rust Inventory of Sexual Satisfaction		
Infrequency	4.43	1.92
Noncommunication	5.10	2.11
Dissatisfaction	4.31	3.36
Avoidance	5.43	2.93
Premature ejaculation/vaginismus	3.24	2.07
Nonsensuality	5.98	3.12
Anorgasmia/erectile dysfunction	5.51	2.84
Eysenck Personality Inventory		
Neuroticism	3.16	1.67
Psychoticism	2.86	1.07
Lie	2.15	1.45
Extroversion	2.96	1.22
BSI		
Anxiety	14.17	10.26
Depression	15.89	10.75
Negative self	13.51	10.01
Somatisation	8.80	6.53
Hostility	8.20	5.60
Global Severity Index	28.23	12.44
Positive Symptom Total Index	2.03	0.69
Positive Symptom Distress Index	1.87	1.14

TABLE 3 Evaluation of Golombok Rust Inventory of Sexual Satisfaction (GRISS) scores according to sex of patients

GRISS Mean scores	Sex				
	<i>n</i>	Female	Male	<i>T</i>	<i>p</i>
Infrequency	225	6.23 ± 2.14	5.88 ± 1.93	0.025	>0.05
Nonsensuality	225	6.74 ± 1.52	2.97 ± 2.45	5.91	0.000
Satisfaction	225	6.45 ± 1.86	3.25 ± 1.45	2.55	0.011
Communication	225	5.25 ± 3.24	5.90 ± 3.12	0.45	>0.05
Avoidance	225	3.50 ± 2.14	6.50 ± 5.25	8.004	0.000
Premature ejaculation/vaginismus	225	2.73 ± 3.75	1.43 ± 2.25	0.78	>0.05
Anorgasmia/erectile dysfunction	225	7.36 ± 3.45	7.25 ± 4.43	0.58	>0.05

When GRISS scores were evaluated in terms of age, a significant negative correlation was found between age and the following subscales: infrequency ($r = -0.356$, $p < 0.05$), communication ($r = -0.474$, $p < 0.05$) and nonsensuality ($r = -0.222$, $p < 0.001$). These problems have been shown to have increased at an early age (Table 4).

When the relation between marital status and GRISS scores was evaluated, it was established that in the dissatisfaction ($F = 5.08$, $p < 0.05$) and infrequency ($t = 4.98$, $p < 0.05$) subscales, married patients obtained higher scores than single patients or widows. The

TABLE 4 Evaluation of Golombok Rust Inventory of Sexual Satisfaction (GRISS) scores according to demographic characteristics of patients

Sociodemographic characteristics	GRISS														
	<i>n</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>		
Age	225	-0.222	0.001	0.011	0.25	-0.356	0.019	-0.474	0.009	0.096	0.22	0.010	0.88	0.028	0.68
Time from diagnosis of renal failure	225	0.002	0.97	0.052	0.85	0.014	0.27	0.028	0.682	0.396	0.011	0.070	0.67	0.079	0.28
Duration of haemodialysis treatment	225	0.055	0.47	0.455	0.001	0.004	0.45	0.023	0.25	0.066	0.42	0.012	0.78	0.079	0.22

dissatisfaction and infrequency problems are more common in married individuals.

When the relation between education status and GRISS scores was evaluated, it was established that in the infrequency ($F = 5.78$, $p < 0.001$) and communication ($F = 3.50$, $p < 0.05$) subscales, elementary school graduates obtained lower scores than other groups. Infrequency and communication problems were less frequent in subjects with low levels of education ($F = 3.50$, $p = 0.016$).

In the evaluation of the relation between GRISS scores and the length of time that had elapsed since being diagnosed with renal failure, a positive relation was found between the avoidance subscale of GRISS and the period of time following diagnosis. The frequency of occurrence of avoidance problems increased as the period of time following diagnosis increased ($r = 0.336$, $p < 0.05$). Concerning the relation between GRISS scores and the overall duration of time on haemodialysis treatment, a positive relation was found between the dissatisfaction subscale of GRISS and the duration of treatment. The dissatisfaction problem increased as the duration of treatment increased ($r = 0.455$, $p < 0.001$) (Table 4).

3.2 | Relations between personality characteristics and sexual dysfunctions

In correlation tests that were used to investigate the relation between sexual problems and personality in patients with CRF, a significant positive relation was found between the communication subscale of GRISS and the Lie subscale of EPI. It has been determined that when the communication increases, the Lie point also increases ($r = 0.215$, $p < 0.001$). In addition, a significant negative relation was found between the Vaginismus and Orgasm subscales of GRISS and the Extroversion subscale of EPI. This showed that Extroversion features increased and vaginismus and orgasm decreased ($r = 0.138$, $p < 0.05$; $r = 0.163$, $p < 0.05$) (Table 5).

3.3 | The relation between sexual dysfunction and psychological symptoms

In BSI, the mean score of PSTI was 28.23 ± 12.44 , the GSI mean score was 2.03 ± 0.69 , and the PSDI mean score was 1.8 ± 1.14 .

TABLE 5 Evaluation of the relation between Eysenck Personality Inventory (EPI) scores and Golombok Rust Inventory of Sexual Satisfaction (GRISS) subscale scores

	n	EPI							
		Extroversion		Neuroticism		Psychoticism		Lie	
GRISS		r	p	r	p	r	p	r	p
Nonsensuality	225	0.055	0.250	0.044	0.210	0.145	0.057	0.049	0.178
Dissatisfaction	225	0.363	0.014	0.006	0.341	0.065	0.089	0.081	0.159
Infrequency	225	0.025	0.110	0.112	0.214	0.078	0.120	0.017	0.350
Communication	225	0.017	0.170	0.106	0.065	0.054	0.350	0.215	0.001
Avoidance	225	0.097	0.120	0.032	0.054	0.032	0.104	0.101	0.062
Premature ejaculation/vaginismus	225	0.238	0.034	0.099	0.078	0.067	0.081	0.022	0.064
Anorgasmia/erectile dysfunction	225	0.155	0.100	0.110	0.062	0.120	0.059	0.120	0.055

In patients with renal failure, the relations between PSTI, PSDI and GSI scores of the BSI and subscale scores of the GRISS were evaluated using Pearson's correlation analysis. After analysis, a significant relation was found between PSTI and the dissatisfaction ($r = 0.189$, $p < 0.05$) and infrequency ($r = 0.217$, $p < 0.001$) subscales of the GRISS. The PSTI point increased, and the dissatisfaction and infrequency point also increased. In addition, a significant relation was found between GSI and nonsensuality ($r = 0.178$, $p < 0.05$), infrequency ($r = 0.220$, $p < 0.001$), dissatisfaction ($r = 0.152$, $p < 0.05$) and communication ($r = 0.171$, $p < 0.05$) subscales of the GRISS. The PSDI point increased as did the infrequency and communication points.

Finally, a significant correlation was found between PSDI and nonsensuality ($r = 0.133$, $p < 0.05$), infrequency ($r = 0.235$, $p < 0.001$) and communication ($r = 0.288$, $p < 0.001$) subscales of the GRISS.

When the relations between the subscale scores of the BSI, other than index scores and GRISS subscale scores, were evaluated, a significant positive correlation was found between nonsensuality and anxiety ($r = 0.351$, $p < 0.001$), negative self ($r = 0.162$, $p < 0.05$) and somatisation ($r = 0.484$, $p < 0.001$). Anxiety, negative self and somatisation increased, and nonsensuality also increased. A positive correlation was found between infrequency and the following variables: depression ($r = 0.474$, $p < 0.001$), anxiety ($r = 0.213$, $p < 0.001$), hostility ($r = 0.222$, $p < 0.001$) and negative self-image ($r = 0.200$, $p < 0.001$). Anxiety and somatisation increased, and dissatisfaction also increased. A positive correlation was found between communication and hostility ($r = 0.253$, $p < 0.001$) and communication and somatisation ($r = 0.216$, $p < 0.001$). Hostility and somatisation increased, and communication also increased (Table 6).

4 | DISCUSSION

In the present study, according to data obtained from the subscales of the GRISS, it was established that there were sexual problems, especially in nonsensuality, anorgasmia, avoidance and communication subscales. In patients on dialysis, the pathophysiology of sexual problems is multifactorial, involving both organic and psychosocial factors. Psychosocial components such as pituitary gonadal axis

TABLE 6 Evaluation of the relation between index scores of the BSI and subscale scores of the Golombok Rust Inventory of Sexual Satisfaction (GRISS)

GRISS Mean scores	n	BSI mean scores									
		Hostility		Somatisation		Depression		Anxiety		Negative self	
		r	p	r	p	r	p	r	p	r	p
Nonsensuality	225	0.085	0.300	0.484	0.001	0.084	0.070	0.351	0.002	0.162	0.015
Dissatisfaction	225	0.101	0.280	0.356	0.001	0.065	0.089	0.281	0.002	0.104	0.095
Infrequency	225	0.222	0.001	0.114	0.220	0.474	0.001	0.213	0.002	0.099	0.086
Communication	225	0.253	0.001	0.216	0.001	0.075	0.280	0.098	0.230	0.111	0.075
Avoidance	225	0.103	0.106	0.097	0.095	0.069	0.092	0.114	0.060	0.117	0.068
Premature ejaculation/vaginismus	225	0.107	0.101	0.106	0.102	0.074	0.098	0.056	0.089	0.048	0.055
Anorgasmia/erectile dysfunction	225	0.114	0.099	0.37	0.064	0.096	0.084	0.120	0.055	0.119	0.078

deterioration, uraemic milieu and comorbid diseases, such as neuropathy and vascular diseases, together with depression, anxiety and social withdrawal, play an important role in the development of sexual problems (van Ek et al., 2017; Rathi & Ramachandran, 2012).

A satisfactory sex life requires the balanced interaction between vascular, neuronal and hormonal systems and sexual structures. If there is disorder in any of these systems, then a number of component parts of sexual functions can be impaired. One of the conditions that can affect all of these systems is CRF (Şahin et al., 2009). In CRF cases, sexual dysfunctions are common problems (Aribi et al., 2015; Arslan & Ege, 2009; Ateş, 2010; Basson et al., 2010; Messina et al., 2007; Navaneethan et al., 2010; Noohi et al., 2010; Peng et al., 2005; Raggi et al., 2012). A complete lack of sexual activity was reported by 33% of patients, and 44% stated that they had only one sexual activity per week. In another study of dialysis patients, it was stated that following the onset of dialysis treatment, 65% of patients were dissatisfied with their sex life. Decreased libido, difficulty in becoming aroused and achieving orgasm, erectile and ejaculatory dysfunction, lack of vaginal lubrication, menstrual irregularities and amenorrhoea are all common problems in patients with chronic kidney disease (CKD) (Messina et al., 2007). In another study, it was reported that after the onset of haemodialysis, 26% of the patients became sexually inactive and in 62% sexual activity decreased. In the same study, the prevalence of sexual dysfunction in haemodialysis patients was found to be 86.5% (Aribi et al., 2015). Unfortunately, sexual health is often diminished when suffering from a chronic illness such as CRF. This is a result of symptoms of the disease and intensive treatments that are needed. For this reason, sexuality should be a subject that is regularly addressed in renal care.

In the present study, it was established that sexual problems exhibited themselves differently according to gender, especially in the areas of satisfaction and nonsensuality. There were more problems associated with satisfaction and nonsensuality in women. This may be consistent with the low sexual desire women reported and that this problem could also be linked with a general lack of interest in sexual activity in their everyday life. The problem of avoidance was more common in men. This problem may be due to

gynaecomastia, which affects 30% of men undergoing dialysis (Palmer & Clegg, 2017).

Changes in body shape may also play an important role because 30% of male patients on maintenance dialysis develop gynaecomastia (Palmer & Clegg, 2017). The results of studies carried out on patients who undergo dialysis treatment indicate that sexual problems are common in both sexes (Arslan & Ege, 2009; Peng et al., 2005; Yılmaz & Özaltın, 2010). Sexual dysfunction is one of the most commonly encountered problems in female patients who are on dialysis (Arslan & Ege, 2009; Peng et al., 2005). In a qualitative study on female haemodialysis patients, carried out by Arslan and Ege (2009), it was found that seven of 10 women experienced sexual problems. Lack of sexual desire, decrease in sexual performance, orgasm problems and dyspareunia due to vaginal dryness are common problems occurring in female patients (Arslan & Ege, 2009; Mor et al., 2013; Noohi et al., 2010; Peng et al., 2005; Şahin & Ertekin, 2009). Similarly, in male dialysis patients, decrease in sexual desire and satisfaction, anorgasmia and erectile dysfunction are common (Al Khallaf, 2010; Barroso et al., 2008; Şahin & Ertekin, 2009; Yılmaz et al., 2009). In the study, by Yılmaz and Özaltın (2010), of patients undergoing peritoneal dialysis, sexual dysfunction was found in 53.6% of female patients and in 28.1% of male patients. In the same study, it was reported that in women undergoing peritoneal dialysis, orgasm and sexual arousal problems occurred more commonly than in men. Decreased libido and impotency can also be due to the adverse side effects of many drugs used in CKD. They can cause vascular problems and also affect neurogenic and psychogenic functions (Rathi & Ramachandran, 2012). According to the results obtained by Gölgeci and Özaltın (2005), in another study performed on dialysis patients, sexual problems are more common in female patients. In this study, it was reported that problems associated with avoidance and nonsensuality were more common in women, whereas premature ejaculation and frequency of sexual activity were the most common problems associated with men. Patients with CKD are subjected to a number of stressors, such as decreased appetite, fear of procedure and medications (Parvan et al., 2015; Rathi & Ramachandran, 2012). The results of the present study are similar to those found in other studies especially concerning the higher

occurrence of problems associated with nonsensuality in women. This may be due to the fact that for women, emotional closeness and tenderness are more important during sex than they are for men (CETAD 2016). Furthermore, any discrepancies between results may be due to the employment of different measurement tools across a number of diverse studies.

The differences between sexes in this respect may have cultural origins from which perceived sex roles have been learned. With the emergence and recognition of serious sexual problems, it is clear that misinformation, negative and judgemental attitudes and unrealistic expectations that exist within society are influential in perpetuating gender specific sex roles (Bahar, Savaş, Yıldızgördü, & Barlıoğlu, 2007; Poroy, 2005). In Turkish culture, a sexual life is considered to be the preserve of men, whereas women are expected to suppress their sexuality. Sex is perceived as an indicator of power and success by most men (Çeri, Yılmaz, & Soykan, 2008). The experience of disease may lead to a loss of this power and give rise to feelings of inadequacy and this may result in men avoiding sexual activity. In the study by Arslan and Ege (2009), it was determined that female haemodialysis patients do not usually discuss their sexual problems with their partners. In fact, there are many social and cultural characteristics in Turkey which prevent women from expressing their sexual problems (Arslan & Ege, 2009; Poroy, 2005). Although it is considered improper in Turkish culture, for women to assume an active attitude and role concerning sexuality and any sexual problems they may have (CETAD 2016), the present study enabled women to freely communicate such problems and this was a very encouraging observation.

When sexual dysfunction in patients was evaluated according to age, it was established that there is a negative correlation between age and dysfunction of sexuality. In our study, infrequency, communication and nonsensuality problems increased at an early age. Autonomy is important for young people. However, in situations where the patient's autonomy is compromised and controlled, accepting and managing the disease is more difficult. This can trigger mental problems (Marciano et al., 2010). In some studies, it has been reported that sexual problems occur more commonly in dialysis patients at a more advanced age (Bahar et al., 2007; Gölgeli & Özalın, 2005) (Aribi et al. (2015). It was stated that the risk of sexual dysfunction increased in patients over the age of 55. However, in the study by Yılmaz and Özalın (2010) on patients undergoing peritoneal dialysis, no significant correlation was found between age and sexual problems.

It was possible to establish in our study that married patients experience more problems in sexual satisfaction and frequency of intercourse than single patients or widows. However, problems that are related to dialysis treatment do not just affect the patients; they are, in fact, more far reaching and have an impact on marital and social lives as well. Sexual life is important for married couples. The success of a marriage largely depends on the sexual relationship between the couple. Being in ignorance of, or not understanding, your partner's sexual needs, has led to many failed marriages and broken homes (Amidu, Owiredu, Gyasi-Sarpong, Woode, & Quaye,

2011). Sexual problems caused by the disease may lead to negative emotions, loss of self-confidence, anxiety, feelings of guilt, anger and vulnerability. These feelings may also leave an individual unable to fulfil the sexual needs for both healthy and ill partners. This situation may be more pronounced in married couples who feel that they have a responsibility towards each other and therefore the expectations in meeting each other's sexual needs are greater.

Our results showed that in patients who are elementary school graduates, communication problems and problems concerning the frequency of intercourse are less common. Awareness of sexual problems increases in line with an increase and improvement in education. Problems caused by chronic disease and other complications are more readily questioned by the individual. In the study by Bahar et al. (2007) on haemodialysis patients, it was concluded that sexual problems increase when there is a decline in the level of education. Furthermore, the study also concluded that lower levels of education may actually exacerbate sexual problems because individuals are prevented from having, or are unable to obtain, informative and educational literature on sexuality and therefore they are not putting this valuable guidance into practice.

According to the results of the present study, as the duration of time from being diagnosed with renal failure lengthens and the period of haemodialysis extends, problems in sexual avoidance and sexual dissatisfaction increases. The lower the level of education, the greater the resignation and acceptance of the disease appears to be. It has been established that chronic diseases may lead to sexual problems by causing various physical and psychological symptoms (CETAD 2016). A longer term of haemodialysis prior to renal transplantation poses a higher risk for the development of erectile dysfunction (Şahin et al., 2009). In addition, long-term dialysis treatments can also have a negative impact on the patients' body images and how they see themselves (Oyekçin, Gülpek, Şahin, & Mete, 2012). Nevertheless, some of the findings in other studies are at variance with our results. In the study by Yılmaz and Özalın (2010) on patients receiving peritoneal dialysis treatment, it was reported that there was no significant relation between the duration of treatment and the rate of sexual problems. Similarly, in the study by Yılmaz et al. (2009) on haemodialysis patients, the duration of haemodialysis treatment was not found to have any significant effect on sexual problems.

In the present study, it was established that sexual problems of vaginismus and orgasm problems in women had a negative correlation with the extroversion dimension. It found that as extrovert characteristics increased in the personality of female patients, vaginismus and orgasm problems subsided. In women with orgasm problems, a decrease in self-esteem, feelings of inadequacy and negative body image are more commonly seen. Passive, dependent and shy women display a higher rate of sexual dysfunction than active, independent and sociable women (CETAD 2016). Negative relations between extroversion and sexual problems may also arise from sex roles and sociocultural characteristics in Turkey (Poroy, 2005). Factors such as the constraints on sexuality, lack of a proper sex education, the perception of sexuality as a taboo subject,

sexual myths and the excessive importance attached to virginity may increase the prevalence of vaginismus in women. Vaginismus is the most common problem encountered in women who are referred to sexual treatment centres in Turkey. In addition, about one-third of the women experience orgasm problems at varying degrees (İncesu, 2004).

The results of the present study indicate that there is a relation between sexual problems and psychological symptoms. Nonsensuality, infrequency and communication problems are greater in individuals with high psychological symptom scores. Reactions, feelings and behaviour that may develop in many diseases and conditions, which may be intensified by treatment and methods of treatment, can lead to sexual dysfunction (Şahin & Ertekin, 2009). Psychological stresses are commonly present in patients with CRF and contribute to the impairment of sexual functions (Ateş, 2010).

It was possible to establish in the present study that sexual dysfunction in infrequency increased, as depression, anxiety, negative self and hostility symptoms increased. In addition, as hostility and somatisation symptoms increased, the communication subscale became more problematic. As anxiety and somatisation symptoms increased, nonsensuality and dissatisfaction subscales revealed more problems and finally, as symptoms of negative self increased, dysfunction in nonsensuality became more common. In the process leading up to CRF, different and progressive metabolic, hormonal and emotional irregularities encountered by the patients increased their levels of stress (Balaban et al., 2017). In patients with CRF, the psychological problems of depression and anxiety, in particular, are common (Amira, 2011; Andrade et al., 2010; Bahar et al., 2007; Cukor et al., 2008; Feroze et al., 2012). In chronic diseases, depression and anxiety are the most common reactions to losses experienced by the patients. In CRF cases, many losses, including physical, familial, professional and social ones are experienced. In association with renal failure and dialysis treatment, loss of power, energy and self-confidence, and alterations in intimate sexual relations intensify feelings of depression and anxiety in patients (Aribi et al., 2015; Bahar et al., 2007; Finkelstein, Shirani, Wuert, & Finkelstein, 2007; Khaira et al., 2012; Peng et al., 2007). In a number of other studies carried out on dialysis patients, a direct relation between sexual problems and depression and anxiety has been recognised (Aribi et al., 2015; Bahar et al., 2007; Oyekçin et al., 2012) (Aribi et al., 2015; Oyekçin et al., 2012; Theofilou, 2012).

In the framework of the holistic nursing approach, the development of suitable environments where patients can discuss their sexual problems in situations where they feel at ease is fundamentally important. The evaluation of sexual functions and their consideration in patient care planning, and offering more patient training programmes on the protection of sexual health are also necessary interventions.

It is also very important that nurses working in such clinics have excellent observation and communication skills so that they are effective in dealing with, and solving, any problems that may arise in dialysis patients. It would be extremely beneficial therefore, for these nurses to be given educational training programmes to improve their skills in managing these problems which they face on a regular basis.

4.1 | Limitations of the study

The present study has some limitations. The most important limitation is that it is a quantitative descriptive study. In order for it to be more conclusive and to determine a more precise correlation between CRF and sexual problems, a follow-up study may yield more valuable results. In the present study, sexual problems in individuals who underwent dialysis treatment for CRF were evaluated in terms of psychological problems and personality traits. A further limitation is that the scales that were used in this study are self-report scales. These scales are based upon the perception made by the patient who may not always give an accurate response. It is possible that the participants may respond according to their social environment and cultural characteristics. It can be acknowledged, however, that the present study is the first publication to investigate the relations between sexual problems and psychological disorders and personality characteristics, in a patient cohort with CRF and as such, is a significant contribution to ongoing research in this particular field.

5 | RELEVANCE TO CLINICAL PRACTICE

There are many physical, familial, occupational and social losses in CRF cases. Changes in sexual life resulting from renal insufficiency and dialysis treatments can cause psychiatric disorders such as depression and anxiety in patients. Sexual health and the psychological well-being of patients is an important issue that should be considered in nursing practice. By allowing nurses to intervene, and thereby reducing the need for consultancy services, they would be able to provide valuable care and support for patients during their, often lengthy, course of dialysis treatment. It is essential therefore that nurses take into consideration the various psychological problems of patients and their relations with partners, and that they evaluate and manage these problems in a holistic way within the framework of nursing practice. The provision of regular and effective counselling for these patients is a fundamental part of the holistic nursing approach. A crucial element amongst nursing consulting initiatives is the development of systematic approaches to screening patients for mental illness and formulating effective and successful treatment strategies. In this context, it is necessary to create suitable environments that allow patients to express their sexual problems easily. In a more relaxed setting, where patients feel more at ease discussing their problems, nurses would be more effective in assessing and evaluating their sexual functions and developing individual patient care plans. Alongside this, nurses would also be able to provide educational information concerning the protection of sexual health. Experiential workshops and role-playing techniques, in particular, have been shown to be effective in managing sexual dysfunctions. Nurses are involved in the day-to-day care of patients and often have close contact with them during intensive treatment sessions (van Ek et al., 2017). Consequently, nurses will be able to play a far more effective role in dealing with, controlling and solving psychological and sexual problems which may emerge quite early on.

Sexual functioning definitely needs to be addressed because it may be pertinent to diagnosis and to how individuals respond to treatment. The diagnosis and treatment of sexual functioning makes a significant contribution to improving quality of life in areas where psychological problems exist. It is also important to take initiatives during the treatment process to inform patients, and make them fully aware, of the various sexual functions and when required, arrange psychiatric consultations. It is necessary for all (renal) caregivers to raise awareness about the importance of sexual health amongst the chronically ill. Nurses working with chronically ill patients must understand the importance of promoting sexual knowledge and must use their skills accordingly especially when a multidisciplinary approach is being employed and psychiatric support is available (van Ek et al., 2017).

The relative benefits of psychological therapies in dialysis patients are not widely known and therefore, large randomised studies of psychotherapy are needed. Future research involving psychological therapy, as defined in clinical practice, is required on renal failure patients with sexual dysfunction.

6 | CONCLUSION

In spite of the above-mentioned limitations, the findings that were obtained from the study, demonstrate that sexual problems are important and should be considered when dealing with patients who undergo dialysis treatment for CRF. In conclusion, it was established that patients undergoing dialysis treatment experience sexual problems in the areas of nonsensuality, anorgasmia, avoidance and communication and that some of these problems are associated with extroversion and psychological symptoms. These results highlight the need for considering the dimension of sexuality when patients, who are undergoing dialysis, are evaluated, and that treatment is managed within the framework of a holistic approach.

CONTRIBUTIONS

Study design: GK, ABG; data analysis: GK, and manuscript preparation: GK, ABG, GTY.

ORCID

Gülseren Keskin  <http://orcid.org/0000-0002-5155-0948>

REFERENCES

- Akpolat, T., & Utaş, C. (2016). *Common problems in hemodialysis patients*. Retrieved from http://www.tsn.org.tr/folders/file/hemodiyaliz_hasta_sinda_karsilasilan_sorunlar.pdf
- Al Khallaf, H. H. (2010). Analysis of sexual functions in male nondiabetic hemodialysis patients and renal transplant recipients. *Transplant International*, 23, 176–181. <https://doi.org/10.1111/j.1432-2277.2009.00972.x>
- Amidu, N., Owiredu, W. K. B. A., Gyasi-Sarpong, C., Woode, E., & Quaye, L. (2011). Sexual dysfunction among married couples living in Kumasi metropolis, Ghana. *BMC Urology*, 11, 3. <https://doi.org/10.1186/1471-2490-11-3>
- Amira, O. (2011). Prevalence of symptoms of depression among patients with chronic kidney disease. *Nigerian Journal of Clinical Practice*, 14(4), 460–463. <https://doi.org/10.4103/1119-3077.91756>
- Andrade, C. P., Cruz, M. C., Urrutia, M., Pereira, O., Draibe, S. A., Nogueira-Martins, L. A., & Sesso, R. (2010). Evaluation of depressive symptoms in patients with chronic renal failure. *Journal of Nephrology*, 23(2), 168–174.
- Aribi, L., Masmoudi, R., Ben Houidi, A., Charfeddine, F., Jarraya, F., Hachicha, J., & Amami, O. (2015). Sexual disorder in hemodialysis patients. *La Tunisie Medicale*, 93(2), 79–84.
- Arslan, S. Y., & Ege, E. (2009). Sexual experiences of women exposed to hemodialysis treatment. *Sex and Disability*, 27(4), 215–221. <https://doi.org/10.1007/s11195-009-9132-1>
- Association for Sexual Education Treatment and Research Associations (CETAD) (2016). *What are the psychological reasons for female sexual problems?* Retrieved from <http://www.cetad.org.tr/news.aspx?detail=19>
- Ateş, F. (2010). The effects of chronic renal failure, dialysis and kidney transplantation on sexual and reproductive functions. *Gülhane Medical Journal*, 52, 229–236.
- Bahar, A., Savaş, A. H., Yıldızgördü, E., & Barloğlu, H. (2007). Anxiety, depression and sexual life in hemodialysis patients. *Anatolian Journal of Psychiatry*, 8(4), 287–292.
- Balaban, Ö. D., Aydın, E., Keyvan, A., Yazar, M. S., Tuna, Ö., & Devrimci Özgüven, H. (2017). Psychiatric comorbidity, sexual dysfunction, and quality of life in patients undergoing hemodialysis: A case-control study. *Nöro psikiyatri arşivi*. 54(2): 137–142. <https://doi.org/10.5152/npa>
- Barroso, L. V., Miranda, E. P., Cruz, N. I., Medeiros, M. A., Araújo, A. C., Mota Filho, F. H., & Medeiros, F. C. (2008). Analysis of sexual function in kidney transplanted men. *Transplantation Proceedings* 40, 3489–3491. <https://doi.org/10.1016/j.transproceed.2008.07.141>
- Basok, E. K., Atsu, N., Rifaioglu, M. M., Kantarci, G., Yildirim, A., & Tokuc, R. (2009). Assessment of female sexual function and quality of life in predialysis, peritoneal dialysis, hemodialysis, and renal transplant patients. *International Urology and Nephrology*, 4, 473–481. <https://doi.org/10.1007/s11255-008-9475-z>
- Basson, R., Rees, P., Wang, R., Montejo, A. L., & Incrocci, L. (2010). Sexual function in chronic illness. *The Journal of Sexual Medicine*, 7(1 Pt 2), 374–388. <https://doi.org/10.1111/j.1743-6109.2009.01621.x>
- Çeri, Ö., Yılmaz, A., & Soykan, A. (2008). Sexual dysfunctions. *Turkey Clinics Journal of Psychiatry Special Topics*, 1(2), 71–78.
- Charlot, A., & DeRoux, S. (2009). Biting through an arteriovenous hemodialysis graft: An unusual method of suicide. *Journal of Forensic Sciences*, 54, 1456–1457. <https://doi.org/10.1111/j.1556-4029.2009.01164.x>
- Cukor, D., Coplan, J., Brown, C., Friedman, S., Newville, H., Safier, M., ... Kimmel, P. L. (2008). Anxiety disorders in adults treated by hemodialysis: A single-center study. *American Journal of Kidney Diseases*, 52(1), 128–136. <https://doi.org/10.1053/j.ajkd.2008.02.300>
- Eckardt, K. U., Coresh, J., Devuyst, O., Johnson, R. J., Köttgen, A., Levey, A. S., & Levin, A. (2013). Evolving importance of kidney disease: From subspecialty to global health burden. *Lancet*, 382, 158–169. [https://doi.org/10.1016/S0140-6736\(13\)60439-0](https://doi.org/10.1016/S0140-6736(13)60439-0)
- van Ek, G. F., Gawi, A., Nicolai, M. P. J., Krouwel, E. M., Den Oudsten, B. L., Den Ouden, M. E. M., ... Elzevier, H. W. (2017). Sexual care for patients receiving dialysis: A cross-sectional study identifying the role of nurses working in the dialysis department. *Journal of Advanced Nursing*, 74(1), 128–136. <https://doi.org/10.1111/jan.13386>

- Esen, B., Kahvecioglu, S., Atay, A. E., Ozgen, G., Okumus, M. M., Seyahi, N., ... Kadioglu, P. (2015). Evaluation of relationship between sexual functions, depression and quality of life in patients with chronic kidney disease at predialysis stage. *Renal Failure*, 37(2), 262–267. <https://doi.org/10.3109/0886022X.2014.990348>
- Fernandes, G. V., dos Santos, R. R., Soares, W., de Lima, L. G., de Macêdo, B. S., da Fonte, J. E., ... Calado, A. A. (2010). The impact of erectile dysfunction on the quality of life of men undergoing hemodialysis and its association with depression. *The Journal of Sexual Medicine*, 7, 4003–4010. <https://doi.org/10.1111/j.1743-6109.2010.01993.x>
- Feroze, U., Martin, D., Kalantar-Zadeh, K., Kim, J. C., Reina-Patton, A., & Kopple, J. D. (2012). Anxiety and depression in maintenance dialysis patients: Preliminary data of a cross-sectional study and brief literature review. *Journal of Renal Nutrition*, 22(1), 207–210. <https://doi.org/10.1053/j.jrn.2011.10.009>
- Finkelstein, O. F., & Finkelstein, S. H. (2014). Sexual inactivity among hemodialysis patients: The patients' perspective. *Clinical Journal of American Society of Nephrology*, 9, 6–7. <https://doi.org/10.2215/CJN.11831113>
- Finkelstein, F. O., Shirani, S., Wuerth, D., & Finkelstein, S. H. (2007). Therapy insight: Sexual dysfunction in patients with chronic kidney disease. *Nature Clinical Practice Nephrology*, 3(4), 200–207. <https://doi.org/10.1038/ncpneph0438>
- Gandaglia, G., Briganti, A., Jackson, G., Kloner, R. A., Montorsi, F., Montorsi, P., & Vlachopoulos, C. (2014). A systematic review of the association between erectile dysfunction and cardiovascular disease. *European Urology*, 65(5), 968–978. <https://doi.org/10.1016/j.eururo.2013.08.023>
- Geisler, F., Wiedig-Allison, M., & Weber, H. (2009). What coping tells about personality. *European Journal of Personality*, 23, 289–306. <https://doi.org/10.1002/per.709>
- Giraldi, A., & Kristensen, E. (2010). Sexual dysfunction in women with diabetes mellitus. *The Journal of Sex Research*, 47, 199–211. <https://doi.org/10.1080/00224491003632834>
- Goldstein, I., Meston, C. M., Davis, S., & Traish, A. (2006). *Women's sexual function and dysfunction: Study, diagnosis and treatment*. London, UK: Taylor & Francis Group.
- Gölgeli, H., & Özalın, G. (2005). Sexual function problems and affecting factors in dialysis patients. *Turkish Nephrology, Dialysis and Transplantation Journal* 14(Ek 1), 132.
- Griva, K., Jatasesa, D., Davenport, A., & Newman, S. (2010). An evaluation of illness, treatment perceptions, and depression in hospital-vs home-based dialysis modalities. *Journal of Psychosomatic Research*, 69, 363–370. <https://doi.org/10.1016/j.jpsychores.2010.04.008>
- İncesu, C. (2004). Sexual functions and sexual dysfunctions. *Clinical Psychiatry*, 3, 3–13.
- K/DOQI. (2007). *Clinical practice guidelines for CKD. IV. Definition and classification of stages CKD*. Guideline 1, up to date (15.3).
- Kara, B. (2012). One of the priority issues in patients with end-stage renal failure undergoing hemodialysis: Quality of life. *TAF Preventive Medicine Bulletin*, 11, 631–638. <https://doi.org/10.5455/pmb>
- Karanci, N., Dirik, G., & Yorulmaz, O. (2007). Reliability and validity studies of Turkish translation of Eysenck Personality Questionnaire Revised abbreviated. *Turkish Journal of Psychiatry*, 18, 1–8.
- Khaira, A., Mahajan, S., Khatri, P., Bhowmik, D., Gupta, S., & Agarwal, S. K. (2012). Depression and marital dissatisfaction among Indian hemodialysis patients and their spouses: A cross-sectional Study. *Renal Failure*, 34(3), 316–322. <https://doi.org/10.3109/0886022X.2011.647291>
- Kütmeç, C. (2009). Sexual dysfunction in women and nursing care. *Firat Health Services Journal*, 4(12), 111–136.
- Lim, R., Liong, M. L., Leong, W. S., Khan, N. A., & Yuen, K. H. (2016). Effect of stress urinary incontinence on the sexual function of couples and the quality of life of patients. *The Journal of Urology*, 196, 153–158. <https://doi.org/10.1016/j.juro.2016.01.090>
- Marciano, R. C., Soares, C. M., Diniz, J. S., Lima, E. M., Silva, J. M., Canhestro, M. R., ... Oliveira, E. A. (2010). Mental disorders and quality of life in pediatric patients with chronic kidney disease. *Jornal brasileiro de nefrologia*, 32(3), 316–322. <https://doi.org/10.1590/S0101-28002010000300014>
- Messina, L. E., Claro, J. A., Nardoza, A., Andrade, E., Ortiz, V., & Srougi, M. (2007). Re: Erectile dysfunction in patients with chronic renal failure. *International Brazilian Journal of Urology*, 33(5), 673–678. <https://doi.org/10.1590/S1677-55382007000500008>
- Mor, M., Sevcik, M., Shields, A., Green, J. A., Palevsky, P. M., Arnold, R. M., ... Weisbord, S. D. (2013). Sexual function, activity, and satisfaction among women receiving maintenance hemodialysis. *Clinical Journal of the American Society of Nephrology*, 9, 128–134. <https://doi.org/10.2215/cjn.05470513>
- Mustafa, R., & Schmidt, R. J. (2015). Sexual dysfunction in dialysis patients: A review. *Austin Journal of Nephrology and Hypertension*, 2(1), 1–7.
- Navaneethan, S. D., Vecchio, M., Johnson, D. W., Saglimbene, V., Gra-ziano, G., Pellegrini, F., ... Strippoli, G. F. (2010). Prevalence and correlates of self-reported sexual dysfunction in CKD: A meta-analysis of observational studies. *American Journal of Kidney Disease*, 56, 670–685. <https://doi.org/10.1053/j.ajkd.2010.06.016>
- Noohi, S., Azar, M., Behzadi, A. H., Barbati, M. E., Haghshenas, A., Amoozgar, B., & Karami, M. (2010). Comparison of sexual function in females receiving hemodialysis and after renal transplantation. *Journal of Renal Care*, 36, 212–217. <https://doi.org/10.1111/j.1755-6686.2010.00198.x>
- Oyekçin, D. G., Gülpek, D., Şahin, E. M., & Mete, L. (2012). Depression, anxiety, body image, sexual functioning, and dyadic adjustment associated with dialysis type in chronic renal failure. *The International Journal of Psychiatry in Medicine*, 43(3), 227–241. <https://doi.org/10.2190/PM.43.3.c>
- Palmer, B. F., & Clegg, D. J. (2017). Gonadal dysfunction in chronic kidney disease. *Reviews in Endocrine & Metabolic Disorders*, 18(1):117–130. <https://doi.org/10.1007/s11154-016-9385-9>
- Parvan, K., Ahangar, R., Hosseini, F. A., Abdollahzadeh, F., Ghojzadeh, M., & Jasemi, M. (2015). Coping methods to stress among patients on hemodialysis and peritoneal dialysis. *Saudi Journal of Kidney Diseases and Transplantation*, 26(2), 255–262.
- Peng, Y. S., Chiang, C. K., Hung, K. Y., Chiang, S. S., Lu, C. S., Yang, C. S., ... Chen, W. Y. (2007). The association of higher depressive symptoms and sexual dysfunction in male hemodialysis patients. *Nephrology Dialysis Transplantation*, 22(3), 857–861. <https://doi.org/10.1093/ndt/gfl666>
- Peng, Y. S., Chiang, C. K., Kao, T. W., Hung, K. Y., Lu, C. S., Chiang, S. S., ... Chen, W. Y. (2005). Sexual dysfunction in female hemodialysis patients: Multicenter study. *Kidney International*, 68, 760–765. [https://doi.org/10.1016/S0085-2538\(15\)50896-X](https://doi.org/10.1016/S0085-2538(15)50896-X)
- Pop-Jordanova, N. D., & Polenakovic, M. H. (2013). Psychological characteristics of patients treated by chronic maintenance hemodialysis. *The International Journal of Artificial Organs*, 36, 77–86. <https://doi.org/10.5301/ijao.5000188>
- Popp, C., Crombez, G., Hanouille, I., Vogelaers, D., & Petrovic, M. (2012). Mental quality of life in chronic fatigue is associated with an accommodative coping style and neuroticism: A path analysis. *Quality of Life Research*, 21(8), 1337–1345. <https://doi.org/10.1007/s11136-011-0048-8>
- Poppe, C., Crombez, G., Devulder, J., Hanouille, I., Vogelaers, D., & Petrovic, M. (2011). Personality traits in chronic pain patients are associated with low acceptance and catastrophizing about pain. *Acta Clinica Belgica*, 66, 209–215. <https://doi.org/10.2143/acb.66.3.2062549>
- Poppe, C., Crombez, G., Hanouille, I., Vogelaers, D., & Petrovic, M. (2013). Improving quality of life in patients with chronic kidney disease:

- Influence of acceptance and personality. *Nephrology Dialysis Transplantation*, 28, 116–121. <https://doi.org/10.1093/ndt/gfs151>
- Poroy, A. (2005). *Sexuality in Turkey*. Istanbul, Turkey: Alfa Publications.
- Prescott, L., Eidemak, I., Harrison, A. P., & Molsted, S. (2014). Sexual dysfunction is more than twice as frequent in Danish female predialysis patients compared to age- and gender-matched healthy controls. *International Urology and Nephrology*, 46, 979–984. <https://doi.org/10.1007/s11255-013-0566-0>
- Raggi, M. C., Siebert, S. B., Friess, H., Schremmer-Danninger, E., Thorban, S., & Dinkel, A. (2012). Sexual and relationship functioning before and after renal transplantation: A descriptive study with patients and partners. *Scandinavian Journal of Urology and Nephrology*, 46, 431–436. <https://doi.org/10.3109/00365599.2012.693132>
- Rathi, M., & Ramachandran, R. (2012). Sexual and gonadal dysfunction in chronic kidney disease: Pathophysiology. *Indian Journal of Endocrinology and Metabolism*, 16(2), 214–219. <https://doi.org/10.4103/2230-8210.93738>
- Şahin, A. F., Cihan, A., Akgül, K., Demir, Ö., Gürkan, A., Çelik, A., ... Esen, A. A. (2009). Sexual functions after kidney transplantation in male patients. *Turkish Journal of Urology*, 35(1), 23–27.
- Şahin, N., & Durak, A. (1994). Brief Symptom Inventory (BSI): Adaptation for Turkish youth. *Journal of Turkish Psychology*, 9(31), 44–56.
- Şahin, D., & Ertekin, E. (2009). Physical illness and sexual dysfunction. *Clinical Development Journal*, 22(4), 75–79.
- Schipper, K., Abma, T. A., Koops, C., Bakker, I., Sanderman, R., & Schroevers, M. J. (2014). Sweet and sour after renal transplantation: A qualitative study about the positive and negative consequences of renal transplantation. *British Journal of Health Psychology*, 19, 580–591. <https://doi.org/10.1111/bjhp.12057>
- Song, Y. S., Yang, H. J., Song, E. S., Han, D. C., Moon, C., & Ku, J. H. (2008). Sexual function and quality of life in Korean women with chronic renal failure on hemodialysis: Case-Control study. *Urology*, 71(2), 243–246. <https://doi.org/10.1016/j.urology.2007.10.020>
- Strippoli, G. F., Vecchio, M., Palmer, S., Craig, J., Johnson, D., Pellegrini, F., ... Manfreda, V. M. (2012). Collaborative depression and sexual dysfunction (CDS) in hemodialysis working group: Sexual dysfunction in women with ESRD requiring hemodialysis. *Clinical Journal of the American Society of Nephrology*, 7, 974–981. <https://doi.org/10.2215/CJN.12601211>
- Teles, F., de Azevedo, V. F. D., de Miranda, C. T., Miranda, M. P., Teixeira, M. do C., & Elias, R. M. (2014). Depression in hemodialysis patients: The role of dialysis shift. *Clinics* 69(3), 198–202. <https://doi.org/10.6061/clinics>
- Theofilou, P. A. (2012). Sexual functioning in chronic kidney disease: The association with depression and anxiety. *Hemodialysis International*, 16(1), 76–81. <https://doi.org/10.1111/j.1542-4758.2011.00585.x>
- Theofilou, P. (2013). Association of insomnia symptoms with kidney disease quality of life reported by patients on maintenance dialysis. *Psychology, Health & Medicine*, 18(1), 70–78. <https://doi.org/10.1080/13548506.2012.674144>
- Tuğrul, C., Öztan, N., & Kabakçı, E. (1993). Standardization of Golombok-Rust Sexual Satisfaction Inventory. *Turkish Journal of Psychiatry*, 4, 83–88.
- Turkey Kidney Diseases Prevention and Control Program (2014-2017) Action Plan. (2014). T.C. Ministry of Health Public Health Agency of Turkey, Ankara.
- Vecchio, M., Navaneethan, S. D., Johnson, D. W., Lucisano, G., Graziano, G., Querques, M., ... Strippoli, G. F. (2010). Treatment options for sexual dysfunction in patients with chronic kidney disease: A systematic review of randomized controlled trials. *Clinical Journal of the American Society of Nephrology*, 5, 985–995. <https://doi.org/10.2215/CJN.09081209>
- Vecchio, M., Palmer, S., De Berardis, G., Craig, J., Johnson, D., Pellegrini, F., ... Strippoli, G. F. (2012). Collaborative Depression and Sexual Dysfunction in Hemodialysis Working Group: Prevalence and correlates of erectile dysfunction in men on chronic haemodialysis: A multinational cross-sectional study. *Nephrology Dialysis Transplantation*, 27, 2479–2488. <https://doi.org/10.1093/ndt/gfr635>
- World Health Organization (WHO). (2010). *Developing sexual health programmes*. WHO/RHR/HRP/10.22.
- Yavuz, D., Ozdemir Acar, F. N., Yavuz, R., Canoz, M. B., Altunoglu, A., Sezer, S., & Durukan, E. (2013). Male sexual function in patients receiving different types of renal replacement therapy. *Transplantation Proceedings*, 45, 3494–3497. <https://doi.org/10.1016/j.transproceed.2013.09.025>
- Yılmaz, A., Goker, C., Kocak, O. M., Aygör, B., Şentürk, V., Nergizoğlu, G., ... Kumbasar, H. (2009). Sexual functioning in hemodialysis patients and their spouses: Results of a prospective study from Turkey. *Turkish Journal of Medical Sciences*, 39(3), 405–414. <https://doi.org/10.3906/sag-0811-16>
- Yılmaz, M., & Özaltın, G. (2010). Sexual problems of individuals with peritoneal dialysis therapy. *Fırat Health Services Journal*, 5(14), 97–112.

How to cite this article: Keskin G, Babacan Gümüş A, Taşdemir Yiğitoğlu G. Sexual dysfunctions and related variables with sexual function in patients who undergo dialysis for chronic renal failure. *J Clin Nurs*. 2019;28:257–269. <https://doi.org/10.1111/jocn.14602>