

## Investigating the Sexual Satisfaction Mediating Role in the Relationship between Health Literacy and Self-Care of Men with Diabetes and Women's Marital Satisfaction

Nesrin İlhan<sup>1\*</sup>, Safiye Telli<sup>2</sup>, Betül Temel<sup>3</sup>, Türkinaz Aştı<sup>1</sup>

<sup>1</sup>Department of Nursing, Faculty of Health Sciences, Bezmialem Vakif University, Istanbul, Turkey.

<sup>2</sup>Bezmialem Vakif University Hospital, Istanbul, Turkey.

<sup>3</sup>Acibadem Atakent Hospital, Istanbul, Turkey.

### Abstract

Diabetes as a chronic disease can have bad impacts on the marital relationships of affected people. Investigating the protective factors' role in the marital satisfaction of these patients is very important. The purpose of this research was to study the sexual satisfaction mediating role in the relationship between self-care and health literacy of men with diabetes and women's marital satisfaction. The current research was of a descriptive-correlation type. To carry out the research, taking into account the inclusion criteria, the samples were selected by simple random method and completed the questionnaires. To collect data, the Enrich couple scale, sexual satisfaction questionnaire, health literacy for adults, and the summary of diabetes self-care activities were used. Data analysis was done using the path analysis method using SPSS 23 statistical software. The findings of the structural model test demonstrated that the fit indices are in a favorable condition. In addition, the findings of the path analysis revealed that the self-care of men with diabetes has a significant and positive effect on women's marital satisfaction with the mediation of sexual satisfaction. Men's health literacy has a positive impact on women's marital satisfaction with the sexual satisfaction mediating role ( $P < 0.01$ ). According to the results of this study, the health literacy and self-care role of men with diabetes in women's marital satisfaction is mediated using sexual satisfaction. Based on the findings of the research, it is suggested to hold educational programs to improve the health literacy and self-care of patients with diabetes.

**Keywords:** Health literacy, Marital relationships, Self-care, Diabetes

### Introduction

Diabetes is a chronic disease in which the body cannot store or utilize glucose. Type 1 and 2 diabetes are very common. In diabetes type 1, the body overall stops producing any insulin. Insulin is a hormone that enables the body to utilize the glucose in food to produce energy. Patients with type 1 diabetes must inject insulin daily to survive. In diabetes type 2, the body does not produce sufficient insulin or is unable to utilize it well [1-3]. The second type of this disease usually occurs in patients who are over 40 years old or overweight and have a family history of diabetes. However, type 2 diabetes is increasing among young people today [4, 5]. Various factors such as aging, lifestyle changes, increased obesity due to inactivity, and high consumption of high-calorie and high-sugar foods, play a role in the emergence of diabetes at different ages. Currently, there are more than 180 million patients with diabetes in the world, and this amount is expected to double by 2030 [6].

**Corresponding author:** Nesrin İlhan

**Address:** Department of Nursing, Faculty of Health Sciences, Bezmialem Vakif University, Istanbul, Turkey.

**E-mail:** ✉ nilhan@bezmialem.edu.tr

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Various studies have shown that diabetes affects various aspects of life, including the quality of life, job, individual-social and psychological performance of people, and especially sexual performance [7] and marital satisfaction of their spouses [8]. Marital satisfaction is obtained through mutual interest, caring for each other, mutual acceptance and understanding, and satisfaction of each other's needs [9]. Various factors affect the marital satisfaction of women with a spouse with diabetes; one of the factors is the self-care of men with diabetes. Self-care behaviors in diabetic patients include following a proper diet, performing physical activities, monitoring blood sugar, following a medication regimen, and taking care of the feet [10]. Self-care is a process in which the patient utilizes his skills and knowledge to perform the recommended behaviors. Thus, not only should they be able to obtain enough information about their disease and how to carry out the necessary care, but they should also be able to utilize their knowledge in various conditions and situations [11].

The review of some studies shows that the high level of self-care is due to having health literacy in these patients [12]. Having health literacy leads to the control and recovery of diabetes in men and increases the marital satisfaction of women. Health literacy is the level of a person's capacity to understand, interpret, and obtain basic information and health services, which is essential for suitable decision-making [13]. The results of the surveys indicate that a low level of health literacy is associated with an increase in the symptoms of diabetes. Considering the significant negative burden of diabetes, improving the health literacy of people can play a decisive role in treating and preventing these diseases and saving resources [14].

In this regard, the two factors of men's self-care and health literacy can affect women's marital satisfaction by influencing women's sexual satisfaction. Sexual satisfaction is a key factor in the life quality of people. Medical diseases and conditions such as diabetes cause couples' sex lives to be suspended. People with diabetes face many problems in achieving sexual satisfaction. Diabetes often causes a decrease in blood flow to the vagina, which is caused by changes in blood vessels that lead to less irritation and sensitivity [15]. Studies have shown that people with diabetes do not have orgasms as easily as others, and the cause is vascular alteration and nerve damage. Indeed, what was utilized to be effective in reaching orgasm, now because of diabetes, no longer helps the affected person to reach orgasm, and this factor will disturb the marital satisfaction of oneself and one's sexual partner [16].

The results of Rosen *et al.*'s research on the relationship between sexual problems and marital dissatisfaction of couples showed that sexual satisfaction is one of the most important aspects of marital satisfaction [17]. In a research, Granado-Casas *et al.* [18] showed that the life quality and sexual performance in patients with diabetes have an effect on the marital satisfaction of couples, and marital infidelity in the other couple will follow in case of permanent poor sexual performance [18].

Considering the importance and basic role of women in maintaining the family psychosocial balance and considering the different problems and issues that they face because of their spouses suffering from diabetes, it is felt necessary to plan to solve the problems facing them. This study investigated the sexual satisfaction mediating role in the relationship between health literacy and self-care of men with diabetes and women's marital satisfaction.

## Materials and Methods

The current research was of a descriptive-correlation type. To carry out the research, taking into account the inclusion criteria, 330 people and their spouses were chosen as a sample according to the table of Krejcie and Morgan [19] by simple random method. People were selected using random numbers based on the registered list of patients on the computer.

In total, 285 people completed the questionnaires completely and were included in the analysis. Of these, 124 people had type 1 diabetes and 161 people had type 2 diabetes. The criteria for entering the research include being married, age range between 22-55 years, having lived together for at least 2 years, having a minimum educational qualification for couples, having a smartphone, not having diabetes, and not having psychological disorders based on the information was recorded in the patient's file. Unwillingness to participate in the research was considered as a criterion for exiting the research.

To collect data, the following tools were used: ENRICH Couple Scale, Sexual Satisfaction Questionnaire, Health Literacy for Adults, and Summary Diabetes: Self-Care Activities.

The ENRICH Couple Scale was designed by Fouples and Elson in 1989 with 35 questions on a 5-point Likert scale from completely disagree to completely agree (score 1-5) to measure marital satisfaction. This tool has a

component of ideal distortion, marital compatibility, communication, and conflict resolution. The maximum and minimum scores in this tool are 35 and 175, and the cutoff score is 90. A high score in this tool indicates greater marital satisfaction. The concurrent validity of this tool was investigated with the 47-question Enrich Marital Satisfaction Questionnaire and its correlation coefficient was calculated to be 0.73. Also, the reliability of the internal consistency method was reported by calculating Cronbach's alpha for the components of ideal distortion (0.83), marital compatibility (0.86), communication (0.80), and conflict resolution (0.84) [20].

Summary Diabetes: Self-Care Activities is a valid self-descriptive index for diabetes self-care that was designed by Tobert *et al.* in 2000 and includes 15 indicators. Questionnaire questions include diet (5 questions), foot care (2 questions), exercise (2 questions), blood sugar control (2 questions), and regular use of medicines (1 question). The way of scoring the questions in this questionnaire is that for each of the self-care behaviors questions, one point is given if performed every day and zero points if not performed. The highest score in this tool is 105, which shows a high level of self-care. Scores between 0 and 34 show poor self-care, scores between 35 and 42 show moderate self-care, and scores above 43 show high self-care. This tool's reliability was determined by Cronbach's alpha method of 0.89 and it has an acceptable criterion validity [21].

The sexual Satisfaction Questionnaire was designed by Hudson *et al.* in 1981 and is answered based on a 5-point Likert scale from always (5) to never (1). This questionnaire has 25 statements and 4 components of willingness to have sexual relations, sexual compatibility, quality of sexual life, and sexual attitude. The overall score of the questionnaire is obtained from the sum of the scores of all questions, a higher score shows greater sexual satisfaction, and the range of scores is between 25 and 125 [22]. In a preliminary study on 70 American couples, Hudson *et al.* estimated the convergent validity coefficient of the sexual satisfaction questionnaire with the self-esteem scale to be 0.56 and the internal consistency reliability using Cronbach's alpha to be 0.73 [22].

Data analysis was done using the path analysis method using SPSS 23 statistical software. Descriptive data were shown by mean and standard deviation. Skewness and kurtosis indices were reported for the normality of the data. Two-by-two relationships between research variables were calculated using Pearson's correlation coefficient test. The fit of the conceptual model was calculated using the fit indices and the direct and indirect effects of the model by the bootstrap test.

## Results and Discussion

Findings associated with demographic variables showed that in terms of age, the mean (standard deviation) of men was 36.72 (4.21) and women 31.67 (6.39). In terms of length of marriage, the average (standard deviation) was 11.33 (6.78) years. **Table 1** demonstrates the mean, standard deviation, skewness, and kurtosis indices, and Pearson's correlation coefficient for all variables.

**Table 1.** Descriptive indices and correlation matrix of research variables.

Variables	Mean	Standard deviation	Normality		Pearson's correlation coefficient matrix		
			Skewness	Kurtosis	Marital satisfaction	Self-care	Health literacy
Marital satisfaction	94.93	43.75	0.181	-1.428	1	-	-
Self-care	38.86	23.60	-0.152	-1.571	0.543	1	-
Health literacy	90.54	36.25	0.666	-1.242	0.388	0.600	1
Sexual satisfaction	62.65	26.18	0.307	-1.449	0.503	0.455	0.424

In **Table 1**, descriptive indices such as mean, standard deviation, kurtosis, skewness, and correlation matrix of study variables are given. As shown in **Table 1**, according to the statistics, the skewness and elongation indices are between -2 and 2. The data distribution is normal and it is possible to perform parametric tests. In addition, the result of Pearson's correlation test revealed that there is a positive and significant correlation between the research variables. In other words, high self-care and health literacy in men can be associated with a high score in women's marital satisfaction ( $P < 0.01$ ). According to this, it can be stated that there is a linear relationship between the variables and it is possible to check their fit in a model. In addition, the results of tolerance statistics and variance inflation factor (VIF) showed that predictor variables do not have multiple linear relationships with each other. In addition, Durbin-Watson's statistic was utilized to check the independence of errors, which was calculated as 1.80 in this study. Considering that this value is between 1.50 and 2.50, it can be concluded that the statistical assumptions for the path analysis are in place.

**Table 2.** Initial and final model suitability indices.

The goodness of the fit index		df		IFI	TLI	CFI	NFI	RMSEA
Basic model	-	0	-	1.00	-	1.00	1.00	0.430
The final model	0.404	1	0.404	1.002	1.011	1.00	0.999	0.0001

Based on the data in **Table 2**, the root mean square index (RMSEA = 0.430) shows that the initial model needs to be modified. To model modification, the non-significant relationship between the health literacy of men with diabetes and the women's marital satisfaction was removed. The results show a good fit of the model. In the following, the results associated with the estimation of the path coefficients for checking the direct hypotheses are presented in **Table 3**.

**Table 3.** Path coefficients of direct impacts between research variables in the final and initial model.

Path	Basic model			The final model		
	Route type	Standard path coefficients ( $\beta$ )	P-value	Route type	Standard estimate ( $\beta$ )	P-value
Self-care of men with diabetes and men's marital satisfaction	Direct	0.383	0.0001	Direct	0.398	0.0001
Self-care of men with diabetes and men's sexual satisfaction	Direct	0.275	0.0001	Direct	0.275	0.0001
Men's health literacy to women's marital satisfaction	Direct	0.037	0.525	Direct	-	-
Men's health literacy to women's sexual satisfaction	Direct	0.320	0.0001	Direct	0.320	0.0001
Women's sexual satisfaction to women's marital satisfaction	Direct	0.316	0.0001	Direct	0.326	0.0001

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The findings of **Table 3** showed that men's self-care has a positive impact on women's marital and sexual satisfaction ( $P < 0.01$ ) and men's health literacy has a positive impact on women's sexual satisfaction ( $P < 0.01$ ). In addition, women's sexual satisfaction had a positive impact on their marital satisfaction ( $p < 0.01$ ). In other words, high scores in men's health literacy and self-care have a positive effect on high sexual satisfaction in women. In addition, women's sexual satisfaction leads to an increase in their marital satisfaction. The method of bootstrap was utilized to specify the significance of mediation relationships, the findings of which are provided in **Table 4**.

**Table 4.** The findings of the method of bootstrap in the investigation of indirect and intermediate paths.

Predictor variables	Mediating variable	Criterion variable	Basic model		The final model	
			Bootstrap	P-value	Bootstrap	P-value
Self-care of men with diabetes	Women's sexual satisfaction	Marital satisfaction of women	0.161	0.001	0.166	0.001
Men's health literacy	Women's sexual satisfaction	Marital satisfaction of women	0.122	0.001	0.126	0.001

Confidence levels (**Table 4**) demonstrate the significance of the indirect path of self-care of men with diabetes to marital satisfaction of women with the mediating role of women's sexual satisfaction ( $\beta = 0.166$ ), which is statistically remarkable at the  $p < 0.01$  level. In addition, the indirect path of health literacy to women's marital satisfaction is significant with the mediating role of sexual satisfaction ( $\beta = 0.126$ ), which was statistically significant at the  $P < 0.01$  level.

This research aimed to study the sexual satisfaction mediating role in the relationship between self-care and health literacy of men with diabetes and marital satisfaction. The results showed that the conceptual model is a good fit. The findings of examining the relationships between the variables showed that the self-care of men with diabetes

has a direct effect on the marital and sexual satisfaction of women. This finding is consistent with the study results of Wong *et al.* in kidney patients [23] and Donoho *et al.* in cardiovascular patients [24]. The results of previous studies show that self-care is one of the effective factors in improving the quality of married life of chronic patients.

Addala *et al.* [1] showed in research that if the patient regularly implements self-care programs, the quality of marital relations improves. They also showed that self-care is more in married people than single people and when there is a richer couple relationship between them, self-care behaviors are more durable. In addition, based on the results of Donoho *et al.* [24], if the patient has an appropriate relationship with his children and wife, he can benefit from their assistance and participation in most of the self-care tasks and have better self-care. In explaining these results, it can be said that self-care behaviors are the result of being responsible for health, and the more people feel responsible for their health, the fewer problems they experience, and as a result, their marital relationships are more satisfied. Indeed, diabetes in men affects different aspects of their marital relationships, the most important aspect of which is sexual satisfaction, which can decrease the commitment and couples' love [25].

The results of this study showed that men's health literacy has no direct effect on women's marital satisfaction. The present result is inconsistent with the study of Eneanya *et al.* in elderly people with chronic diseases and Stechova *et al.* in women with type 1 diabetes [26]. In the mentioned research, the relationship between health literacy and marital satisfaction was done with correlation coefficient and regression tests and this relationship was significant, while in the present research, they were investigated with path analysis. In the current research, the relationship between health literacy and marital satisfaction was significant in the Pearson test, but in the model, because of the presence of a mediator variable, all the effects and contributions of the self-care variable of men with diabetes on marital satisfaction is explained through the mediator variable or the indirect relationship. Indeed, in this model, the health literacy variable affects women's marital satisfaction.

Another finding of this research revealed that there is a positive relationship between sexual satisfaction and health literacy. Indeed, by increasing the health literacy of men with diabetes, it can be expected that the sexual satisfaction of their women will improve. This finding is consistent with the study results of Stechova *et al.* in women with type 1 diabetes [26], Patras *et al.* in infertile women [27], and Kugbey *et al.* in women with breast cancer [28]. In research, Kugbey *et al.* found that access to health information and health literacy improves sexual function and quality of life in breast cancer patients and reduces depression and anxiety in them [28]. In explaining this finding, it can be stated that health literacy increases the ability to manage diabetes and self-regulate via diet in men with diabetes, and their consciousness of the impact of this disease on sexual relations and marital life increases. Health literacy has been introduced as social and cognitive skills that determine the ability and capacity of people to understand, process, acquire, and apply health information, in a way that causes suitable decision-making in the field of health and ultimately cause improves health [26].

Other findings of this study revealed that there is a positive and significant relationship between sexual satisfaction and marital satisfaction of women. This means that by improving women's sexual satisfaction, it can be expected that their marital satisfaction will increase. This result is in line with the research results of Granado-Casas *et al.* in people with type 1 diabetes [18]. Another result of the research showed that sexual satisfaction plays a mediating role in the relationship between the self-care of men with diabetes and women's marital satisfaction. In the background check, no study to compare with this finding was available to the researcher. In explaining this finding, it can be said that performing self-care behaviors is related to improving sexual satisfaction. In other words, self-care improves health, and as a result, the sexual performance of a person with diabetes improves, considering that sexual satisfaction is one of the most important elements of a marital relationship, it can be expected that marital satisfaction will increase in women. In addition, the results revealed that sexual satisfaction plays a mediating role in the relationship between health literacy and women's marital satisfaction, and this hypothesis was confirmed.

## Conclusion

The purpose of this research was to study the sexual satisfaction-mediating role in the relationship between self-care and health literacy of men with diabetes and women's marital satisfaction. The findings of the structural model test revealed that the fit indices are in a favorable condition. In addition, the findings of the path analysis demonstrated that the self-care of men with diabetes has a significant and positive effect on women's marital satisfaction with the mediation of sexual satisfaction. Men's health literacy has a positive effect on women's marital satisfaction with the sexual satisfaction-mediating role. Based on the findings of this study, the health literacy and self-care role of men with diabetes in women's marital satisfaction is mediated using sexual

satisfaction. Based on the findings of the research, it is suggested to hold educational programs to improve the self-care and health literacy of patients with diabetes.

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