

## Sexual Dysfunction in Human Papillomavirus Positive Females during Reproductive Age

Gulsum Uysal<sup>\*</sup>, Sevdha Bas, Sevki Goksun Gokulu, Nefise Tanridan Okcu and Emre Destegul

Department of Obstetrics and Gynecology Adana City Education and Research Hospital, Adana, Turkey.

<sup>\*</sup>Corresponding author: Gulsum Uysal, Department of Obstetrics and Gynecology, Gynecology, Adana City Education and Research Hospital, Adana, Turkey. Tel: +905309238863; E-mail: [gulsumaykut@yahoo.com](mailto:gulsumaykut@yahoo.com)

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### Abstract

**Objective:** Female sexual dysfunction (FSD) has been reported 40% of women of all ages and has important and unique effect on quality of life. We aimed to examine sexual function of patients with positive Human Papillomavirus (HPV) test results and investigate whether HPV has any impact on female sexual functioning since it has become a risk and distress of cancer.

**Methods:** In Turkey, since 2014, women aged 30-65 years are screened for free by Family Health Centers with HPV-DNA test for cervical cancer. Sexually active, with at least basic literacy reproductive aged women who applied to oncology department of gynecology with HPV positive test results were included the study. History of systemic, chronic disease, including psychiatric disease or on psychiatric medication, pelvic organ prolapse, history of pelvic surgery (known to cause female sexual dysfunction), pregnant, body mass index (BMI)>30, and premature menopause women were excluded. Female sexual dysfunction index (FSFI) was used to assess FSD. A score of less than 26 indicated sexual dysfunction. HPV negative healthy women created control group. The groups were matched for age, BMI, parity, socio demographic and educational levels. The demographic, obstetric and gynecologic history of all patients was recorded.

**Results:** A total of 119 women were recruited. Among patients, 54 had HPV positive test results while 65 had negative as controls. There was no significant difference between in mean scores of age, partner's age, duration of marriage and BMI. The two groups were comparable with respect to number of children, education level and occupational status. The mean score on FSFI was  $22.3 \pm 6.6$  points in HPV positive women and  $26.3 \pm 4.6$  in healthy controls. Except for desire, other domains of FSFI (arousal, lubrication, orgasm, satisfaction, and pain) were statistically significantly lower in HPV positive women compared to controls in our study.

**Conclusion:** Female sexual dysfunction was prevalent among women with HPV infection. These patients are needed to be routinely checked for sexual dysfunction.

**Keywords:** Female sexual dysfunction index; Human Papilloma virus; Reproductive age; Women; Frequency of sexual activity; Arousal; Orgasm; Lubrication

**Abbreviations:** HPV: Human Papillomavirus; FSFI: Female Sexual Function Index

### Introduction

Globally, Human papillomavirus (HPV) is the most prevalent sexually transmitted disease among women of reproductive age [1]. Approximately 233.9 million women in worldwide have HPV, which is usually detected and eliminated by the immune system [2]. It is transferred by skin-to-skin sexual contact and is accompanied with and without clinical lesions. In case of persistent infection, HPV is highly associated with cervical cancer and also related with cancers of vulva, vagina, penis, anus, rectum and oropharynx [2,3]. The optimal screening method of cervical cancer includes Papanicolaou (Pap) test, HPV testing, or both. Of the 30 to 40 lower genital tract specific HPV types, HPV 16 and 18 are the most oncogenic ones. Abnormal cytologic Pap results and positive HPV tests can cause anxiety and

fear of cancer [4]. In a study, depending on the outcome of the mail survey, more than 400 women reported that a positive HPV result negatively affected their feelings about sexual relations regardless of Pap test results [5]. Moreover, Nagele et al. suggested that HPV related precancerous genital lesions, especially vulva, were prone to worry about sexual health [6]. These patients should be given more information to alleviate anxiety and negative sexual outcomes [6]. Although some studies have investigated socio demographic characteristics and sexual behavior of HPV positive patients, little research has been conducted on sexual function of these patients [7,8].

Female sexual dysfunction (FSD) has been reported 40% of women of all ages and has important and unique effect on quality of life [9]. Although it is a frequent complaint, women do not report their problems to doctors. Additionally, the sexual life of patients is not well investigated since it is a shame to talk about sexuality in our culture. FSD has subtypes like lack of desire, impaired arousal, and inability to achieve orgasm or pain during sexual activity [10]. Nearly, 39% of women have low desire which is the most common problem among FSD and is mostly associated with distress [9]. Therefore, we aimed to examine sexual function of patients with positive HPV test results and investigate whether HPV has any impact on female sexual functioning

since it has become a risk and distress of cancer. To our knowledge this is the first study about sexual function among HPV positive women compared to negative healthy controls and is original.

## Methods

### Study design

This present cross-sectional study group consists of HPV positive women and control group comprises HPV negative women questionnaire based study was conducted between January 2018 and June 2018 at Department of Obstetrics and Gynecology, Adana City Training and Research Hospital, Adana, Turkey. Informed written consent was obtained from all participants. The study was approved by the local ethics committee (2017/88).

In Turkey, since 2014, women aged 30-65 years are screened for free by Family Health Centers with HPV-DNA test for cervical cancer. Women who applied to oncology department of gynecology with HPV positive test results were handed study questionnaires and asked to return the self-completed forms in a separate room allowing sufficient privacy. Data of patients' age, partners' age, parity, obstetric history (vaginal delivery, cesarean section), body mass index (BMI), smoking habit, duration of marriage, educational status (primary, middle school, high school, university), profession, contraceptive method, previous pelvic surgery, chronic illness were recorded. Types of HPV, duration of follow up were also recorded. HPV negative healthy women created control group. The groups were matched for age, BMI, parity, socio demographic and educational levels.

### Patient selection

Sexually active, with at least basic literacy, aged between 30 and 55 women with HPV positive test results were included the study. History of systemic, chronic disease, including psychiatric disease or on psychiatric medication, pelvic organ prolapse, history of pelvic surgery (known to cause FSD), pregnant, obese (BMI>30), and premature menopause women were excluded. Use of any medication that could affect sexual functioning (e.g., anti-hypertensive, anti-arrhythmia drugs, sedative drugs and tricyclic antidepressants), presence of any dermatologic disorder were also excluded.

## Main Outcome Measures

### FSFI

Validated questionnaires the Female Sexual functions Index (FSFI) were used to evaluate sexual health of patients and presence of FSD over the past 4 weeks. The FSFI which was developed by Rosen et al. is a self-report questionnaire that includes 19 items and 6 subscales that evaluate desire, subjective arousal, lubrication, orgasm, satisfaction, and pain during the previous months [11].

Each subscale is scored from 0 to 6 and higher scores in each subscale indicate better sexual function. This 19-item questionnaire contains two items on sexual desire, four items on arousal, four items on lubrication, three items on orgasm, three items on satisfaction, and three items on pain. The total score of sexual function ranges from a minimum of 1.2 points to a maximum of 36 points; higher scores imply higher sexual function. The study for Turkish reliability and validity of this test was performed by Aygin and Eti Aslan [12]. In the reliability study, Cronbach alpha coefficient was 0.98 [12]. It was indicated that FSFI was a reliable and valid measure of sexual function among Turkish women. A total score less than 26 was considered as FSD. Higher scores indicated better sexual function.

### Statistical analysis

The clinical features of both groups were compared with the Statistical Package for Social Sciences (SPSS) for Windows, version 18.0 (SPSS Inc. IL, USA). Normality of data distribution was tested with Kolmogorov-Smirnov test.

Data was presented as means  $\pm$  SD for continuous variables. To assess the differences in variables between groups, the independent t test was used. Results with non-normal distribution, Kruskal-Wallis, Mann-Whitney U-test and Bonferroni correction were used. Values of  $p < 0.05$  was accepted as statistically significant.

## Results

During the study period, a total of 119 women were recruited. Among patients, 54 had HPV positive test results while 65 had negative as controls. The baseline characteristics of the patients who completed the survey were shown in Table 1.

	HPV positive N= 54	HPV negative N= 65	P value
Age (y)	36.8 $\pm$ 5.8	36.8 $\pm$ 5.7	0.9
Partners age (y)	40.8 $\pm$ 6.1	40.5 $\pm$ 6.2	0.7
Duration of marriage (y)	15 (1-30)	11 (1-27)	0.5
BMI (kg/m <sup>2</sup> )	25.9 $\pm$ 4.7	24.9 $\pm$ 4.0	0.1
Number of Children	2.1 $\pm$ 1.1	1.8 $\pm$ 0.8	0.1
Age of last child (y)*	7.5 (0-27)	6.0 (0-19)	0.08
Irregular period (yes)	4 (7.4)	4 (6.1)	0.5
Type of delivery, N (%)			
Vaginal birth	35 (64.8)	24 (36.9)	0.02

Cesarean section	19 (35.2)	41 (63.1)	
History of infertility (yes) N (%)	2 (3.7)	2 (3.1)	0.8
Smoking (yes) N (%)	23 (42.6)	14 (21.5)	0.01
Alcohol (yes) N (%)	2 (3.7)	1 (1.5)	0.4
Occupational status N (%)			
Housewife	41 (75.9)	45 (69.3)	0.7
Employed	13 (24.1)	20 (30.7)	
Contraception methods N (%)			
Condom	8 (14.8)	15 (23.1)	
OCT	5 (9.3)	0	
IUD	18 (33.3)	23 (35.4)	
Withdrawal	14 (25.9)	14 (21.5)	0.1
Tubal ligation	3 (5.6)	4 (6.2)	
Others	1 (1.9)	2 (3.1)	
No contraception	5 (9.3)	4 (6.2)	
Frequency of Sexual Activity			
<once per month	3 (5.6)	1 (1.5)	
1-2 per month	9 (16.7)	5 (7.7)	
1-2 per week	25 (46.3)	44 (67.7)	0.1
2-3 per week	13 (24.1)	13 (20)	
3-4 per week	3 (5.6)	1 (1.5)	
>4 per week	1 (1.9)	1 (1.5)	
Education level, N (%)			
Primary school	24 (44)	27 (41.8)	
Middle school	7 (13)	9 (13.8)	0.7
High school	18 (33.3)	22 (33.6)	
University	5 (9.3)	7 (10.6)	
BMI: Body Mass Index, y: Year, N: Number, OCT: Oral Contraceptives, IUD: Intrauterine Device, *: Median(min-max)			

**Table1:** Basic characteristics of groups.

There was no significant difference between in mean scores of age, partners' age, duration of marriage and BMI. The two groups were comparable with respect to number of children, education level and occupational status. Contraception methods and frequency of sexual activity were also similar between groups. The most common contraception method was IUD in both groups. The frequency of smoking and vaginal delivery were significantly higher in HPV positive women ( $p=0.01$ ,  $p=0.02$ , respectively). No other significant

differences in frequency of menstrual period or infertility were reported.

Except for desire all scores of 5 subscales that evaluate subjective arousal, lubrication, orgasm, satisfaction, and pain were statistically significantly lower (compatible with sexual dysfunction) in HPV positive women. The domain scores of FSFI were summarized in Table 2.

	HPV positive N= 54	HPV negative N= 65	P value
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Desire	3.2 ± 1.0	3.6 ± 0.9	0.07
Arousal	3.5 ± 1.2	4.0 ± 1.0	0.02
Lubrication	3.9 ± 1.4	4.9 ± 0.8	<0.001
Orgasm	3.7 ± 1.4	4.5 ± 0.9	<0.001
Satisfaction	4.0 ± 1.5	4.5 ± 0.9	0.04
Pain	3.8 ± 1.6	4.7 ± 1.0	<0.001
Total FSFI	22.3 ± 6.6	26.3 ± 4.6	<0.001

**Table 2:** FSFI Domain scoring between groups.

The mean score on FSFI was  $22.3 \pm 6.6$  points in HPV positive women and  $26.3 \pm 4.6$  in healthy controls. Although mean FSFI scores were different, the frequency of sexual activity was similar with the most rate of 1-2 per week. 54 recruited HPV positive women, 20 had HPV type 16 and 34 had other types. The median duration after diagnosis of HPV positivity was 2 months (2 min-24 max).

## Discussion

This study reports that women with positive HPV results for cervical screening test had poorer sexual function. Female sexual dysfunction (FSD) was highly prevalent among women infected with HPV compared to women with negative HPV results. Smoking and vaginal delivery were also associated with FSD in HPV positive women in reproductive age. Cervical cancer, caused by HPV infection which is sexually transmitted, is one of the most common female cancers [3]. The positive HPV DNA test results causes anxiety depending on patients' understanding of or knowledge about the disease. Little is known about FSD in the status of HPV infection among reproductive women although FSD affects the lives of many women worldwide [9,10].

Previous studies have shown that sexual dysfunction was not rare among Turkish reproductive aged women [13,14]. Cayan et al. reported the rate of FSD as 25.5% among 28-37 aged employed women in the south of Turkey in 2004 [13]. In another study, the rate of FSD was found to be 41% among 18-30 aged women in the middle of our country in 2006. Because of the large surface area, the differences in socio-cultural life, educational level, economic situation and climate affect the prevalence of FSD in Turkey.

Low desire, the most common complaint in sexual problems, was reported by 39% of women and found to be associated with distress in 10 to 14% [9]. Positive test results for HPV can lead to distress and alleviate worries about hygiene and infection of a sexual partner [5]. Moreover, referral for colposcopic evaluation was found to cause anxiety on its own [15]. The lower score in domains of FSFI such as arousal, lubrication, orgasm and sexual satisfaction may also be explained by anxiety in HPV positive women. However in this study, the exact reason of lower scores for pain related to HPV is not known. Contraceptive methods were similar and women with history of pelvic surgery known to cause FSD were also excluded. The etiology of sexual dysfunction is often multifactorial. The other factors such as fatigue, conflict within the relationship may relate to low scores in FSFI independent of HPV results.

Kucukunal et al. examined the associations between sexual dysfunction, depression and anxiety among men suffering from genital warts [16]. They reported that male patients with genital warts have higher rates of sexual dysfunction compared to controls. Although genital HPV infection may present clinically as genital warts in both males and females, there was no patient with genital warts in this study. Genital warts can lead to physical problems that make sexual activity uncomfortable [16]. In addition patient can notice the warts but much less is known about the impact of cervical HPV infection on sexual quality. Similar to genital warts, cervicovaginal HPV exposure may deteriorate sensation during sexual contact and lead to poor scores in orgasm, satisfaction, arousal and lubrication.

It is well known that smoking is a risk factor for HPV infection and cervical cancer. The frequency of smoking was significantly higher in HPV positive women in our study. Cayan et al. found no significant effect of cigarette smoking on sexual function [13]. On the other hand, several studies have shown that cigarette smoking affects sexual dysfunction [14,17].

Hosseini et al. compared sexual function between women who had vaginal delivery and planned cesarean section [18]. FSFI was used to assess sexual function before pregnancy, 6 and 24 months after delivery. They revealed that there were no significant differences regarding six domains of sexual function between two groups. Therefore, the type of delivery was not considered as an additive effect on sexual dysfunction in our study even though vaginal deliveries were significantly higher in HPV positive women.

Except for desire, other domains of FSFI (arousal, lubrication, orgasm, satisfaction, and pain) were statistically significantly lower in HPV positive women compared to controls in our study. However, there was no significant difference in frequency of sexual activity (number of coitus). This may be explained by the role of women in cultural factors and similar desire domain scores.

There are several limitations in this study. First, the study population is too heterogeneous. Second, we did not assess the sexual function of the male partner nor did we measure the psychological state of the participants objectively such as Beck or Stress questionnaires. Instead, participants were asked about this, and if mentioned any psychological disorders, they were excluded. Since it is unpredictable that HPV may be transient in some people, we have not designed a study from the first diagnosis to long follow up HPV exposure, yet. Further long followed up studies are needed to assess the effect of HPV exposure in years about FSD.

Nevertheless, the current study has definitive strengths. First, to our knowledge, this study was the first to investigate sexual function of HPV positive women. Second, a standard, reliable questionnaire was used for measuring the sexual dysfunction.

In conclusion, our results suggest that FSD was prevalent among women with HPV infection. These patients are needed to be routinely checked for sexual dysfunction and comprehensive care should be given in a multi-disciplinary team.

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