

# Factors Associated with Sexual Dysfunction in Women Experiencing Anogenital Warts at Siriraj Hospital

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**Background:** Women with genital warts often suffer not only from pain and discomfort but also the impact of psychosocial function and lower quality of life. The prominent and highly recurrent nature of genital warts may directly and negatively impact libido and female sexual function.

**Objective:** To explore the rate of female sexual dysfunction in women experiencing genital warts and determine the associated factors.

**Materials and Methods:** Of the 215 female patients diagnosed with anogenital warts attending the sexually transmitted disease (STD) clinic at Siriraj Hospital, 129 of them currently had lesions and 39 of them denied any history of sexual relations in the previous four weeks. Forty-seven participants were enrolled in the study. According to the Thai version of Female Sexual Function Index (TFSEFI), a total score of less than 26.55 is classified as having sexual dysfunction.

**Results:** Prevalence of female sexual dysfunction in the study group was 62%. Mean total score of the study group was 24.3±5.0. In having and not having female sexual dysfunction group, mean total score were 21.5±4.2 and 28.9±2.0, respectively, with statistically significance ( $p<0.001$ ). Education level of at least Bachelor's degree and diagnosis duration of 12 months or longer were found to be less associated with female sexual dysfunction (OR 0.19, 95% CI 0.04 to 0.79 and OR 0.18, 95% CI 0.03 to 0.92). However, number of warts, maximum size of wart, number of treatments, treatment duration, and partnership duration in both groups were different but did not meet statistical significance.

**Conclusion:** Genital warts have negative impact on patients' quality of life since these affect self-esteem and social affiliation. Because it affects all domains of sexual function, genital warts have negative effect on sexual life. Adequate information and effective treatment are requisites to diminish undesirable sexual problems.

**Keywords:** Sexual dysfunction, Genital warts, Quality of life

Received 22 Feb 2020 | Revised 4 Mar 2020 | Accepted 10 Mar 2020

**J Med Assoc Thai 2020;103(4): 359-64**

**Website:** <http://www.jmatonline.com>

Genital human papillomavirus (HPV) infection is an extremely common sexually transmitted infection (STI). Anogenital warts (AGW) are present in approximately 1% of sexually active adults in the United States<sup>(1)</sup>. Likewise, the prevalence was up to 4.6% among commercial sex workers in Thailand<sup>(2)</sup>.

Statistics from the Siriraj Female STI clinic showed 100 to 150 cases new diagnoses of genital warts per year. HPV, a family of DNA virus, can cause genital, anal, or oral warts. Women less than 25 years of age have the highest rates of HPV infection. Female gender and a high number of sexual partners are common risk factors for HPV infection<sup>(3)</sup>. Although a decline in AGW was seen since the introduction of the HPV vaccination program using the quadrivalent vaccine in many countries<sup>(4-7)</sup>, AGW remains a key problem in other countries such as Thailand due to lack of coverage in national vaccination programs.

AGW not only causes pain, discomfort, and itching but also impacts the psychosocial function and the quality of life. Patients with AGW were

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**How to cite this article:** Parkpinyo N, Chayachinda C, Thamkhantho M. Factors Associated with Sexual Dysfunction in Women Experiencing Anogenital Warts at Siriraj Hospital. J Med Assoc Thai 2020;103:359-64.

generally worried about the indefinite timeline and overall image of recovery. They were often depressed and had low self-esteem. Patients found it difficult to detach themselves from their genital warts because of the repeated treatments and the negative effects on their sexual lives. Pirotta et al assessed the psychosocial burden of HPV-related genital disease and the significant psychosocial impacts were found for women having diagnosis of genital warts<sup>(8)</sup>. In addition, Vriend et al encountered that the impact of genital warts on health-related quality of life was greater for women than for men<sup>(9)</sup>.

The impact of genital warts on sexual dysfunction was influenced by age, relationship status, size, and recurrence of warts<sup>(9)</sup>. Sexual dysfunction refers to a problem occurring during sexual response that prevents the individual or couple from experiencing satisfaction from the sexual activity. Female sexual dysfunction (FSD) is a prevalent problem, afflicting approximately 14.9% to 64.3% of the women<sup>(10-17)</sup>. There are several instruments used to measure sexual dysfunction in women. The Female Sexual Function Index (FSFI) is a widely used measurement of FSD<sup>(18)</sup>. It assesses six domains, which are desire, arousal, lubrication, orgasm, satisfaction, and pain. Factors associated with FSD included increasing age, body image satisfaction, body weight, long-term stress, and social role<sup>(19,20)</sup>. Since data regarding sexual dysfunction in women with sexually transmitted disease (STD) are still lacking<sup>(21,22)</sup> and there are no adequate studies in Asian countries, exploring the prevalence of sexual dysfunction in women experiencing genital warts and associating factors contribute to holistic care and proper management for this population.

## Materials and Methods

The cross-sectional study was conducted in the Siriraj Female STI Clinic between May and December 2019. The ethical approval was obtained from the Siriraj Institutional Review Board (COA Si171/2018).

### Participant selection

Informed consent was obtained from each patient. All participants were required to meet the inclusion criteria, which was 1) women aged 18 years or older, 2) history of genital warts diagnosed and followed-up in the Siriraj Female STI clinic, 3) recovered from genital warts for more than one month, 4) understand well the Thai language, and 5) having sexual activity at least two times in the past month without using condom. The exclusion

criteria were 1) pregnant women, 2) cancer patients, 3) partner having sexual dysfunction i.e., impotence, and 4) having problem with sexual activity before genital warts were diagnosed.

### Data collection

Patients having recovered from genital warts and being in a follow-up period were counseled before recruitment and completed the written informed consents. During the appointments, qualified peers (nurses and physicians) conducted a health questionnaire and recorded the socio-demographic information including gender, medical history, and behavioral data. However, the section of the questionnaire from the Thai version of Female Sexual Function Index (TFFSFI)<sup>(23)</sup>, was completed by the participants themselves. TFSSFI is a validated questionnaire with a reliability coefficient of 0.96. It is a self-administered questionnaire with 19 questions consisting of six domains (minimum-maximum score), namely desire (1.2 to 6), arousal (0 to 6), lubrication (0 to 6), orgasm (0 to 6), satisfaction (0.8 to 6), and pain (0 to 6). The total minimum and maximum scores were 2 and 36, respectively. The lower score represents poorer sexual function. A total score of less than 26.55 is classified as having sexual dysfunction<sup>(24)</sup>.

### Data analysis and sample size calculation

Demographic data and descriptive statistics were compared by mean  $\pm$  standard deviation (SD) or median (min-max). Comparative data between groups were compared by Independent t-test for normal distribution and Mann-Whitney U test for non-normal distribution. Logistic regression was used to explore the associating factors. Data were analyzed with the use of the Stata, version 12.0 (StataCorp LP, College Station, TX, USA). A p-value of less than 0.05 was considered statistically significant. The sample size calculation was done by manual calculation using the prevalence of Thai FSD at 14.9%<sup>(14)</sup> and allowed error at 10%.

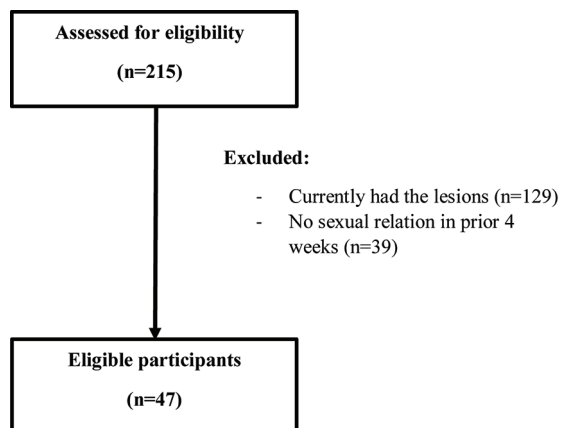
## Results

In all, 215 patients were assessed for eligibility, 129 patients currently had the lesions and 39 of them had no sexual activity in the four weeks prior to the study. Then, forty-seven patients were included in the study (Figure 1). The socio-demographic characteristics of the study population are shown in Table 1. The mean age of the participants was 33.6 $\pm$ 9.5 years. Most of the participants' education

**Table 1.** Socio-demographic characteristics of the study population

Socio-demographic	Female sexual dysfunction		Total (n=47)	p-value
	Yes (n=29)	No (n=18)		
Age (year); mean±SD	33.7±10.9	33.7±7.2	33.6±9.5	0.997
BMI (kg/m <sup>2</sup> ); mean±SD	22.5±5.5	23.6±5.7	22.9±5.6	0.531
Education; n (%)				0.051
Elementary school	3 (10.3)	0 (0.0)	3 (6.4)	
High school	12 (41.4)	3 (16.7)	15 (31.9)	
Bachelor's degree or higher	14 (48.3)	15 (83.3)	29 (61.7)	
Income (Thai baht); median (min-max)	25,000 (7,000 to 100,000)	37,500 (20,000 to 105,000)	30,000 (7,000 to 105,000)	0.017
Marital status	19 (65.5)	9 (50.0)	28 (59.6)	0.422
Parous women	15 (51.7)	5 (27.8)	20 (42.6)	0.137
Sexual health history				
Age at sexually active; mean±SD	20.7±4.6	22.4±4.3	21.4±4.5	0.204
Lifetime number of partners; median (min-max)	1 (1 to 10)	2 (1 to 26)	2 (1 to 26)	0.508
Wart-related issues; median (min-max)				
Diagnosis duration of warts (month)	14 (1 to 199)	36.5 (2 to 144)	24 (1 to 199)	0.193
Number of warts	3 (1 to 20)	1 (1 to 10)	3 (1 to 20)	0.618
Maximum size of warts(mm)	6 (2 to 30)	5 (2 to 15)	5 (2 to 30)	0.458
Location of warts; nc(%)				
• Posterior fourchette	18 (62.1)	8 (44.4)	26 (55.3)	0.237
• Labia minora	16 (55.2)	10 (55.6)	26 (55.3)	0.980
• Labia majora	6 (20.7)	5 (27.8)	11 (23.4)	0.577
• Vagina	7 (24.1)	2 (11.1)	9 (19.2)	0.270
• Cervix	5 (17.9)	3 (16.7)	8 (17.4)	0.917
Duration of treatment (month)	1 (1 to 12)	1 (0.5 to 12)	1 (1 to 12)	0.560
Current sexual health; n (%)				
Current sexual activity problem				0.265
• No	12 (41.4)	11 (61.1)	23 (48.9)	
• Yes	17 (58.6)	7 (38.9)	24 (60.0)	
Sexual activity/month; median (min-max)	1 (1 to 12)	1 (1 to 12)	1 (1 to 12)	0.748

SD=standard deviation

**Figure 1.** Flow diagram of participant selection.

level was Bachelor's degree or higher (61.7%). Women having no sexual dysfunction tended toward having a higher degree of education and higher income than the sexual dysfunction group. Regarding wart-related issues, the no FSD group inclined to having longer diagnosis duration of warts, lower number of warts, and smaller size of warts. Likewise, the FSD group tended toward having current sexual activity problem afterward. Nevertheless, all of these socio-demographic characteristics between groups were not statistically significant.

Table 2 shows that the prevalence of FSD in the study group was 62%. The mean total score of the study group was 24.3±5.0. In having and not having FSD group, the mean total scores were 21.5±4.2 and

**Table 2.** FSFI score

Domain	Female sexual dysfunction; mean±SD		Total (n=47)	p-value
	Yes (n=29)	No (n=18)		
Desire	4.6±1.5	5.6±1.2	5.0±1.5	0.015
Orgasm	9.0±2.7	13.4±1.7	10.7±3.2	<0.001
Pain	9.0±3.9	13.6±1.9	10.8±4.0	<0.001
Arousal	9.8±2.4	12.7±2.4	10.9±2.8	<0.001
Satisfaction	11.7±2.4	13.8±1.2	12.5±2.2	0.001
Lubrication	13.1±3.7	17.9±1.8	14.9±3.9	<0.001
Total score	21.5±4.2	28.9±2.0	24.3±5.0	<0.001

SD=standard deviation

**Table 3.** Associating factors of sexual dysfunction in women with genital warts

Factors	Female sexual dysfunction; n (%)		OR (95% CI)	p-value
	Yes (n=29)	No (n=18)		
Education: ≥Bachelor's degree	14 (48.3)	15 (83.3)	0.19 (0.04 to 0.79)	0.022
Diagnosis duration: ≥12 months	17 (58.6)	16 (88.9)	0.18 (0.03 to 0.92)	0.039
Number of warts: ≥5 warts	11 (37.9)	5 (27.8)	1.59 (0.44 to 5.69)	0.477
Maximum size of wart: ≥10 mm	11 (37.90)	3 (16.7)	3.06 (0.72 to 13.01)	0.131
Number of treatments: ≥4 times	12 (41.4)	8 (44.4)	0.88 (0.27 to 2.89)	0.836
Treatment duration: ≥1 month	19 (65.5)	14 (77.8)	0.54 (0.14 to 2.09)	0.375
Partnership duration: ≥1 year	19 (65.5)	14 (77.8)	0.54 (0.14 to 2.09)	0.375

OR=odds ratio; CI=confidence interval

28.9±2.0, respectively ( $p<0.001$ ). Education level (at least Bachelor's degree) and diagnosis duration (12 months or longer) were found to be less associated with FSD. FSD group and no FSD group having at least a Bachelor's degree were 48.3% and 83.3%, respectively, with crude odds ratio (cOR) 0.19 (95% CI 0.04 to 0.79;  $p=0.022$ ). Diagnosis duration of 12 months or longer, in having and not having FSD group were 58.6% and 88.9%, respectively, with cOR 0.18 (95% CI 0.03 to 0.92;  $p=0.039$ ). However, the number of warts, maximum size of wart, number of treatments, treatment duration, and partnership duration in both groups were different but without statistical significance (Table 3).

## Discussion

The easy visibility and high recurrence nature of genital warts directly and negatively impact libido and female sexual function. This leads to significant psychosocial burden of negative self-image, self-esteem, and dreadfulness for both patients and their partners<sup>(25)</sup>. In the present study, 62% of the participants had FSD while the study of Graziottin

et al<sup>(21)</sup> found that 29% of men and 10% of women with genital warts may have a negative impact on feelings about sex. Regarding FSFI score, the total score of the present study was 24.3±5.0. Then, FSD decline in all aspects of sexual function in women suffering from genital warts can be implied. This is in concordance with the study of Morin et al<sup>(26)</sup> that genital warts were associated with decreased sexual desire, arousal, and dyspareunia. Moreover, the study by Graziottin et al<sup>(21)</sup> reported that the negative feelings included fear and anxiety about becoming ill and cancer transformation, concerns about fertility, sexual transmission, and relationship issues including blaming the partner for the source of infection. Feelings of blameworthy, doubts concerning transmission, and assumed unfaithfulness were behind the breakdown of the relationships between patients and their partners that may conclude with divorce.

According to the authors' findings, a significant relation was determined between the women having sexual problems with education level and diagnosis duration. Participants with high education level (at least Bachelor's degree) were found to have less FSD

problem. Benning et al<sup>(27)</sup> found that there was higher level of HPV knowledge among patients with higher levels of education. Well understood perception in the course and progression of the disease in the study group can be inferred. Furthermore, diagnosis duration of more than 12 months was associated with less FSD. Longer period from diagnosis and treatment may contribute to less impact on sexual function including sexual difficulties, feelings e.g., embarrassment. This implies that supportive counseling and long-term follow-up visits will help these patients to cope with the negative psychosocial impact, particularly sexual issue.

Regarding the present study, factors having a tendency to be associated with FSD included number of warts (five or more) and wart size (10 mm or larger). Even so, there was no statistical significance. Patients with large and numerous genital warts were often depressed and had low self-esteem. The patients' self-image as well as their social lives were habitually affected by the stigmatization caused by the disease. What healthcare providers may help is to shorten the suffering by giving intensive management such as multi-modality treatment and frequent follow-up visits. From the authors' experience, the mental support is as important as the physical one.

The strength of the present study is that this is one of the very few reports on sexual dysfunction in women with history of AGW. The burden has been widely known but the present study appears to be the first study that shows the scale of problem in detail. This may lead to more understanding and tailor-made solution for this population. However, our small sample size may be the limitation. Moreover, as sexual issue is much affected by cultural background, thus, the generalizability of the study may be limited to East Asian women.

## Conclusion

FSD in women with genital warts essentially becomes a problem due to the high prevalence. High education level and long diagnosis duration were the significant factors affecting less FSD in the present group of patients. Because it affects all domains of sexual function, genital warts may have negative effect on sexual life. Adequate information and effective treatment are requisites to diminish undesirable sexual problems.

## What is already known on this topic?

Genital warts is one of the most common STDs at the authors' clinic in Siriraj Hospital, particularly

among the reproductive age. The recurrent rate of the genital warts is around 40% to 60%, and the treatment is costly, either medically or surgically. Most of the women with genital warts seek medical treatment due to loss of self-esteem, embarrassment, and uncertainty, whether they are benign or malignant lesions. Last but not least, the genital lesions such as genital warts can be closely related to the HPV infection and pre-cancerous lesions of the vaginal and cervical epithelium, so cervical screening for cancer must be emphasized among women with genital warts.

## What this study adds?

Not only the coincidence of genital warts but also the occurrence of pre-cancerous lesion and cervical cancer from the HPV can raise the awareness of the negative impact on quality of life of women in reproductive age. It can also cause the negative impact on patient's quality of life, self-esteem, and social affiliation. Sexual dysfunction is one of the negative effects on sexual activities. Proper counseling with constructive information and effective treatment are required to offer a solution to undesirable sexual dysfunction

## Acknowledgement

The authors would like to thank all the staffs in the STD clinic and Dr. Paphanun Yindee-Arom, Department of Obstetrics and Gynecology, Faculty of Medicine Siriraj Hospital, Bangkok, who provided any technical help and general support.

## Conflicts of interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and publication of this article.

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