

Comparison of Sexuality in Women with Vulvovaginal Candidiasis Versus non Infected Women

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Abstract

Sexual health is an important part of the quality of life of women and is defined by the World Health Organization as “a state of physical, emotional, mental and social well-being related to sexuality. The aim of this study was to assess sexual function in women with vulvovaginal candidosis in comparison with women without lower genital tract dysfunction. The study was performed on 200 married women, who attended the outpatient clinics in Benha University Hospital during the period from January to May, 2020. Regarding the demographic data, 40% and 58% of infected and control groups respectively, belonged to the age group of 30-39 years old, 37% and 72% of the same groups had secondary school and university degree educational level. The majority of both groups were living in the rural areas. VVC was associated with lower sexual desire, decreased lubrication, less frequency of reaching orgasm and low satisfaction of sexual life.

Keywords: Vulvovaginal candidosis, Provoked vulvodynia and Germ tube test.

1. Introduction

Genital tract infections are common problems in women [1].

Vaginitis is an inflammation and infection of the vagina and its symptoms include itching or irritation, unusual and malodor discharge, leukorrhea and dyspareunia [2].

Vulvovaginal candidosis (VVC) is an infection caused by candida species that affects millions of women every year. It is one of the common vaginal infections in women which could affect their quality of life, romantic relationships and sexual performance [3].

Candida albicans is responsible for 85-95% of vaginal yeast infection [4]. This disease is mostly seen in women of reproductive age [5]. Studies have shown the occurrence of this problem has been rare before the age of menarche and has been observed less commonly at postmenopausal ages [6,7]. This indicates the existence of hormonal dependency for the infection [8].

The development of VVC is usually attributed to the disturbance of the balance between candida vaginal colonization and host environment by physiological or non-physiological changes. Several host related and behavioral risk factors have been proposed as predisposing factors for VVC. Host related factors include pregnancy, hormone replacement, uncontrolled diabetes, immunosuppression, antibiotics, glucocorticoids use and genetic predispositions. Behavioral risk factors include use of oral contraceptive, intrauterine device, spermicides and condoms and some habits of hygiene and sexual practices [9].

It is estimated that, 75% of women will have a vaginal yeast infection at least once in their lifetime. Approximately, 45% of women will experience this infection two or more times [4].

Provoked vulvodynia (PVD) is a chronic vulvar pain condition affecting up to 8.3 % of the female population. Despite many years of research, no clear cause for PVD has been identified. Several risk factors

have been studied, including VVC. However, to date, the role of candida infections in PVD has remained unclear. VVC and PVD have an overlap of symptoms that may contribute to diagnostic inaccuracy and mistreatment [10]. Women with VVC and PVD had significantly more symptoms of sexual dysfunction than women without lower genital tract diseases [3].

2. Aim of the work

The aim of this work was to assess sexual function in women with vulvo-vaginal candidosis in comparison with women without vulvovaginal candidosis.

3. Patients and methods

The methodology of this study was described according to

- I- Administrative Design.
- II- Technical Design.
- III- Statistical Design.

Administrative design

The present study started after approval of Dermatology & Andrology department and The Medical Ethics Committee in Benha University.

Technical Design

A) Place of the study

The participants were questioned in the outpatient clinics of Benha University hospital.

B) Study sample (participants)

The study was performed on 200 married women who attended the outpatient clinics in Benha University Hospital during the period from January to May, 2020.

The participants were divided into two groups

- **Group 1:** 100 women who were infected with vaginal candidosis.
- **Group 2:** 100 women who were not infected with vaginal candidosis as a control group.

C) Tools

A self-report questionnaire which was designed according to female sexual function index (FSFI) questionnaire ⁽¹¹⁾, with some more questions which were added to suit the current study. They were written in English and translated into Arabic to be understood by all subjects regardless their level of education. Face to face, questionnaire was not used to avoid any embarrassment and to give the subjects a wide range of privacy and freedom to express themselves without any disturbance or fear.

A copy of the English and Arabic questionnaires is given in Appendix I.

The aim of the study and details of the questionnaire were explained to the women before taking their informed consent.

Each woman who had symptoms and signs of VVC, was subjected to clinical examination in the

lithotomy position for inspection of vaginal rash and thick, cheesy, whitish and bad odor secretions and obtaining a vaginal swab. High vaginal swabs were collected after speculum insertion using left hand (index finger and thumb) to separate the labia, after that the speculum was inserted sideways (blades closed, angled downwards and backwards) and rotated back 90 degrees (so that the handle was facing upwards). Then the speculum blades were opened until an optimal view of cervix was achieved Fig (1). At this time, the locking nut was tightened to fix the position of the blades and hold in place. The swab was removed from its tube, then inserted about 5 cm into the vaginal opening and turned for about 30 seconds while rubbing it against the vaginal wall. At the end, the swab was removed carefully without touching any surface before placing it into the collection tube. Finally the speculum was removed.

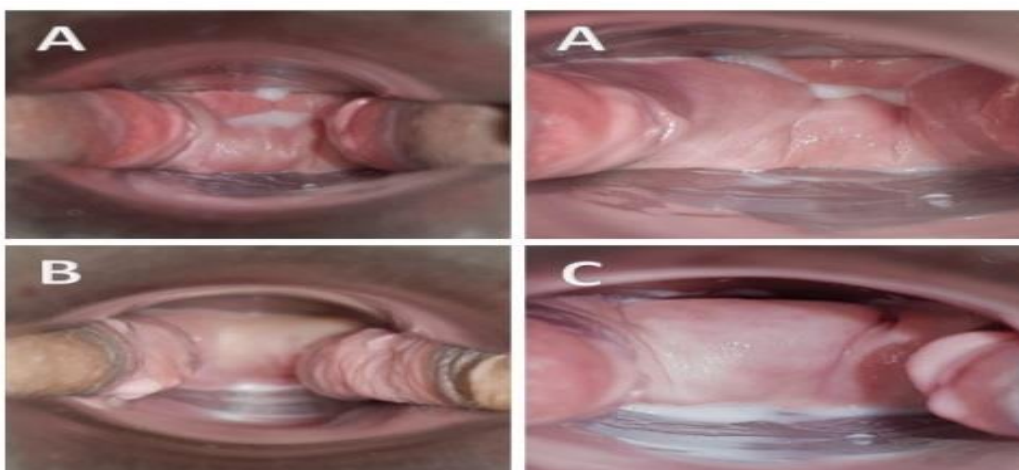


Fig (1) Speculum examination of three cases (A, B and C) from our study group (infected participants).

Case A: aged 40 years old complained from vaginal itching and thick whitish vaginal discharge.

Case B: aged 31 years old complained from dyspareunia and thick whitish vaginal discharge. **Case C:** aged 53 years old complained from burning sensation during urination, vaginal itching and thick whitish vaginal discharge. All swabs were labelled with date and patient's number then sent immediately to medical laboratory for processing Fig (2).

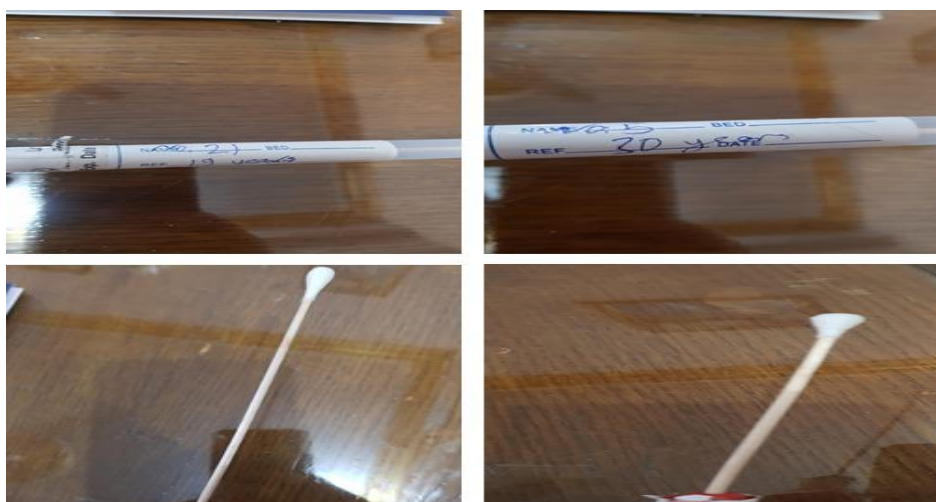


Fig (2) Vaginal swab

Gram stain smear, another technique used, smears of swabs were made from the saline mixture, while each smear was air-dried and heat-fixed by passing over a Bunsen burner flame three times to fix the slide

to preserve microorganisms and to prevent smears being washed from slides during staining. The slide was Gram-stained and then examined microscopically for oval yeast cells Fig (3) and Fig (4).

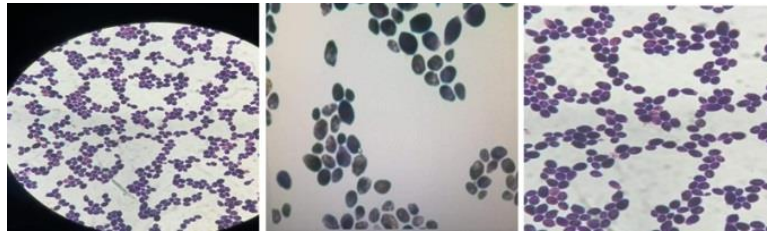


Fig (3) Gram stain smear for case 3.

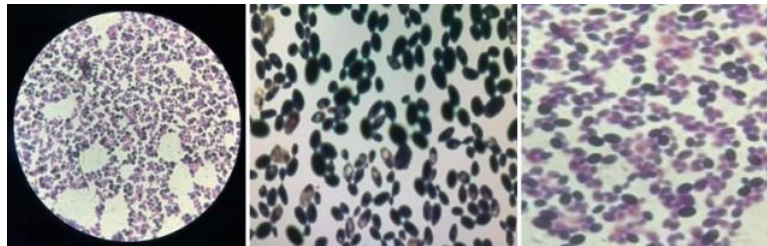


Fig (4) Gram stain smear for case 4.

Candida isolates were speciated phenotypically by germ tube test (GTT) which was used to differentiate candida albicans from other yeast, when candida was grown in human or sheep serum at 37°C for 3 hours,

they formed germ tubes, which could be detected with wet KOH films filamentous outgrowth extending from yeast cells Fig (5).



Fig (5) Positive germ tube test for case 3.

Each participant was asked to fill the questionnaire. To ensure that all gathered information was kept confidential and the subject was anonymous, each questionnaire was handed in an open envelope and after filling it; the participant sealed the envelope and put it in a basket containing other sealed envelopes.

Inclusion criteria

Married women with regular sexual relation.

Exclusion criteria

Unmarried women.

Women with any medical or psychological disease that impair sexual relation.

D) Study design

The current study was conducted as a cross-sectional study.

Statistical design

The collected data was analyzed by computer using Statistical Package of Social Service (SPSS) version 22. Data was represented in tables and graphs, two types of statistics were done

Descriptive

Categorical qualitative variables were expressed as absolute frequencies (number) & relative frequencies (percentage).

Analytical**Chi-Squared (χ^2)**

It was used to compare between two groups or more regarding one qualitative variable in 2x2 contingency table or raw-column complex table.

Fisher's Exact Test (FET)

It was used to compare between proportions at small frequencies.

P value

- Significant difference if $P < 0.05$.
- Non-significant difference if $P > 0.05$.
- Highly significant difference if $P < 0.001$.

4. Results

The number of the studied participants was 200, divided into two groups, infected and control, 100 participants for each.

Table (1) Demographic data.

Variable	Infected (n=100)		Control (n=100)		
	n	%	n	%	
Age	<20	6	6	4	4
	20-29	37	37	25	25
	30-39	40	40	58	58
	40-49	8	8	9	9
	≥ 50	9	9	4	4
Educational level	Read and write	29	29	10	10
	Secondary school	37	37	18	18
	University degree	34	34	72	72
Residence	Urban	35	35	57	57
	Rural	65	65	43	43

The most common age group of participants was 30-39 years, 40% in infected group and 58% in control group. Secondary school and university degree were the most common educational levels among infected

and control groups (37% & 72%) respectively. Regarding residence, participants of both infected and control groups were distributed in rural and urban areas (65% & 57%) respectively Table (1).

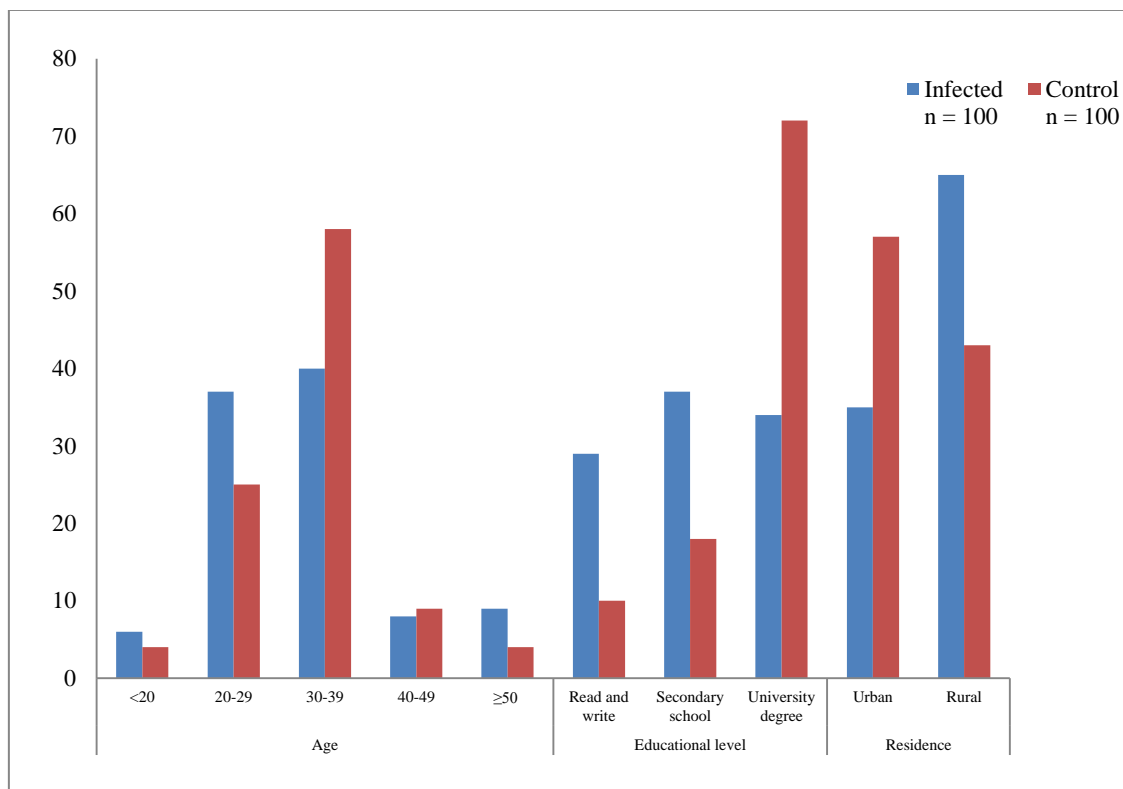
**Fig (6)** Demographic data.

Table (2) Vaginal swab.

Variables	Educational level										P-value		
	Read and write		Secondary school				University degree						
	Infected (n=29)		Control (n=10)		Infected (n=37)		Control (n=18)		Infected (n=34)			Control (n=72)	
	n	%	n	%	n	%	n	%	n	%	n	%	
Desire frequency													
Almost always or always	0	0	1	10	2	5.4	7	38.9	8	23.5	14	19.4	
>50% of times of sexual encounters	1	3.4	5	50	2	5.4	7	38.9	6	17.6	30	41.6	
<50% of times of sexual encounters	7	24.1	2	20	19	51.4	3	16.7	13	38.2	23	32	0.0001
Rare or almost never	21	72.4	2	20	14	37.8	1	5.5	7	20.6	5	7	**
Level of desire													
Very high	0	0	1	10	0	0	3	16.7	1	3	7	9.7	
High	1	3.4	1	10	4	10.8	7	38.9	7	20.6	22	30.5	
Moderate	4	13.8	6	60	10	27	5	27.8	17	50	35	48.6	0.0001
Low	8	27.6	2	20	16	43.2	2	11.1	3	8.8	5	7	**
Very low or none	16	55.2	0	0	7	19	1	5.5	6	17.6	3	4.2	
Lubrication													
No sexual activity	1	3.4	1	10	4	10.8	1	5.5	5	14.7	9	12.5	
Almost always or always	2	6.9	3	30	1	2.7	9	50	10	29.4	34	47.2	
>50% of times of sexual encounters	2	6.9	4	40	10	27	6	33.3	8	23.5	20	27.8	0.0001
<50% of times of sexual encounters	13	44.8	1	10	18	48.6	2	11.1	9	26.5	8	11.1	**
Rare or almost never	11	38	1	10	4	10.8	0	0	2	5.9	1	1.4	
Difficulty to become lubricated													
No sexual activity	2	6.9	1	10	4	10.8	1	5.5	5	14.7	10	13.9	
Extremely difficult	22	75.9	2	20	23	62.2	3	16.7	10	29.4	4	5.5	0.004
Not difficult	5	17.2	7	70	10	27	14	77.8	19	55.9	58	80.6	**
Maintenance of lubrication													
No sexual activity	2	6.9	1	10	4	10.8	1	5.5	5	14.7	11	15.3	
Almost always or always	0	0	3	30	2	5.4	6	33.3	7	20.6	30	41.6	
>50% of times of sexual encounters	3	10.3	4	40	5	13.5	4	22.2	6	17.6	20	27.8	0.025
<50% of times of sexual encounters	13	44.8	1	10	18	48.6	7	38.9	14	41.2	9	12.5	**
Frequency of reaching orgasm													
No sexual activity	2	6.9	1	10	4	10.8	1	5.5	5	14.7	9	12.5	
Almost always or always	0	0	1	10	0	0	4	22.2	6	17.6	17	23.6	
>50% of times of sexual encounters	1	3.4	4	40	3	8.1	5	27.8	7	20.6	24	33.3	0.002
<50% of times of sexual encounters	7	24.1	2	20	11	29.7	6	33.3	8	23.5	14	19.4	**
Rare or almost never	19	65.5	2	20	19	51.4	2	11.1	8	23.5	8	11.1	
Satisfaction with sexual life													
Very satisfied	0	0	1	10	0	0	6	33.3	4	11.8	25	34.7	0.006
Moderately satisfied	0	0	2	20	2	5.4	6	33.3	8	23.5	20	27.8	**
Equally satisfied and dissatisfied	7	24.1	5	50	6	16.2	4	22.2	5	14.7	10	13.9	
Moderately dissatisfied	13	44.8	0	0	19	51.4	2	11.1	10	29.4	11	15.3	
Very dissatisfied	9	31	2	20	10	27	0	0	7	20.6	6	8.3	
Dyspareunia													
No sexual activity	2	6.9	1	10	4	10.8	1	5.5	4	11.8	7	9.7	0.696
Very high	15	51.7	0	0	7	19	0	0	2	5.9	1	1.4	
High	8	27.6	0	0	12	32.4	0	0	11	32.3	1	1.4	
Moderate	3	10.3	3	30	13	35.1	5	27.8	11	32.3	15	20.8	
Low	1	3.4	1	10	1	2.7	7	38.9	3	8.8	25	34.7	
Very low	0	0	5	50	0	0	5	27.8	3	8.8	23	32	

Statistical Test: Chi- Square test. ** (P ≤0.05): Significant Statistical value. Table(2) shows that desire frequency, level of desire, obtaining lubrication during coitus, frequency of reaching orgasm, satisfaction with

overall sexual life and maintenance of lubrication during coitus were lower in infected group than control group, while difficult lubrication during coitus was higher in infected group than control group with a statistically significant difference for all.

Table (3) Relation between residence and sexual activity in participants.

Variables	Residence								P-value	
	Urban				Rural					
	Infected (n=35)		Control (n=57)		Infected (n=65)		Control (n=43)			
	n	%	n	%	n	%	n	%		
Desire frequency										
Almost always or always	5	14.3	9	15.8	5	7.7	13	30.2		
>50% of times of sexual encounters	5	14.3	24	42.1	4	6.1	18	41.9		
<50% of times of sexual encounters	14	40	20	35.1	25	38.5	8	18.6	0.250	
Rare or almost never	11	31.4	4	7	31	47.7	4	9.3		
Level of desire										

Table (3) Continue

Very high	0	0	6	10.5	1	1.5	5	11.6	
High	3	8.6	15	26.3	9	13.8	15	34.9	
Moderate	18	51.4	30	52.6	13	20	16	37.2	0.029
Low	7	20	5	8.8	20	30.8	4	9.3	**
Very low or none	7	20	1	1.8	22	33.8	3	7	
Lubrication									
No sexual activity	5	14.3	7	12.3	5	7.7	4	9.3	
Almost always or always	6	17.1	25	43.8	7	10.8	21	48.8	
>50% of times of sexual encounters	10	28.6	17	29.8	10	15.4	13	30.2	0.170
<50% of times of sexual encounters	10	28.6	7	12.3	30	46.1	4	9.3	
Rare or almost never	4	11.4	1	1.8	13	20	1	2.3	
Difficulty to become lubricated									
No sexual activity	5	14.3	8	14	6	9.2	4	9.3	
Extremely difficult	15	42.8	4	7	40	61.5	5	11.6	0.200
Not difficult	15	42.8	45	79	19	29.2	34	79.1	
Maintenance of lubrication									
No sexual activity	5	14.3	9	15.8	6	9.2	4	9.3	
Almost always or always	5	14.3	20	35.1	4	6.1	19	44.2	
>50% of times of sexual encounters	5	14.3	17	29.8	9	13.8	11	25.6	0.491
<50% of times of sexual encounters	15	42.8	9	15.8	30	46.2	8	18.6	
Rare or almost never	5	14.3	2	3.5	16	24.6	1	2.3	
Frequency of reaching orgasm									
No sexual activity	5	14.3	7	12.3	6	9.2	4	9.3	
Almost always or always	3	8.6	12	21.1	3	4.6	10	23.3	
>50% of times of sexual encounters	6	17.1	19	33.3	5	7.7	14	32.6	0.232
<50% of times of sexual encounters	10	28.6	13	22.8	16	24.6	9	20.9	
Rare or almost never	11	31.4	6	10.5	35	53.8	6	13.9	
Satisfaction with sexual life									
Very satisfied	1	2.8	16	28.1	3	4.6	16	37.2	
Moderately satisfied	6	17.1	19	33.3	4	6.2	9	20.9	
Equally satisfied and dissatisfied	8	22.9	9	15.8	10	15.4	10	23.3	0.193
Moderately dissatisfied	10	28.6	8	14	32	49.2	5	11.6	
Very dissatisfied	10	28.6	5	8.8	16	24.6	3	7	
Dyspareunia									
No sexual activity	4	11.4	5	8.8	6	9.2	4	9.3	
Very high	6	17.1	1	1.8	18	27.7	0	0	
High	11	31.4	1	1.8	20	30.8	0	0	0.642
Moderate	11	31.4	11	19.2	16	24.6	12	27.9	
Low	1	2.9	20	35	4	6.2	13	30.2	
Very low	2	5.7	19	33.3	1	1.5	14	32.6	

Statistical Test: Chi- Square test. ** ($P \leq 0.05$): Significant Statistical value. Table (3) shows that, infected participants distributed in urban and rural areas had lower level of desire than control participants with a statistically significant difference, while other variables had no statistical difference between the both groups.

4. Discussion

Sexual health is an important part of the quality of life of women and is defined by the World Health Organization as "a state of physical, emotional, mental and social well-being related to sexuality [12].

However, sexual function is rarely explored in a public health context. It has been given little attention as a component of sexual health policy, and its association with other sexual health indicators has seldom been measured [13].

Lesser sexual function is related to advancing age, menopause, and economic and health problems [14].

Vulvovaginal candidosis is a frequent and common distressing disease affecting women of all ages and across social strata globally. It is the second most common cause of vaginal infections after bacterial vaginosis. Estimates indicate that 70%–75% of women of childbearing age worldwide experience at

least one episode during their lifetime, and 5%–10% of women with a primary episode of VVC experience frustrating recurrent infection, defined as at least three-four specific episodes within one year [15].

Despite decades of research and high global prevalence, VVC and RVVC continue to present major health issues in affected women [16].

RVVC remains an intractable problem for clinicians and patients alike in spite of major therapeutic advances globally. RVVC is a highly troublesome and emotionally traumatic condition for women. It is a source of considerable physical discomfort. It affects the woman's quality of life and may impact negatively on her sexual life as well [15].

The aim of this work was to assess sexual function in women with vulvovaginal candidosis in comparison with women without vulvovaginal candidosis.

This study included 200 participants, who were divided as: 100 infected participants and 100 control participants. Most of them were 30-39 years old in infected and control groups as matched with the results of [16, 17].

In current study, it was found that 8% of infected participants had never or rarely felt sexual desire, in accordance with, [15] who reported that some may avoid sexual intimacy with their partners as the

symptomatic episodes may be associated with recent and/ or frequency of sexual intercourse or particular sexual practice.

In our study, it was found that, 42% and 8% never or rarely felt sexual desire among infected and control participants, respectively. While lubrication was obtained in less than half the times of sexual encounters in 40% of infected participants and 11% of control, and it was extremely difficult in 55% of infected participants and 9% of control participants, which means frequency of desire and lubrication were lower in infected participants than control participants. Frequency of reaching orgasm and satisfaction with overall sexual life were also lower in infected group than control one. That come in agreement with [18] who reported that in the case group, sexual function score in all domains (desire, lubrication, orgasm, and satisfaction) has been lower than the control group. And partially in accordance with [3] who reported that orgasm and satisfaction were lower in case group than control group with significant statistical difference.

Eighty percent of infected participants suffered from signs/symptoms associated with vulvovaginal candidosis (i.e. vaginal itching, burning, redness, vaginal pain and thick, cheesy, whitish, offensive secretions) these results are in agreement with [16].

5. Conclusion

Vulvovaginal candidosis was associated with lower sexual desire, decreased lubrication, less frequency of reaching orgasm and low satisfaction of sexual life.

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