

Effect of nursing intervention on the recurrence of Vulvovaginal candidiasis infection

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Abstract

Background: The second most common reason of vaginitis is vaginal Candidiasis. 29–49% of females report at least one life time episode, recurrent vulvovaginal candidiasis refers to the attack of confirmed symptomatic VVC for 4 times or above within 1 year. **Aim:** the present study aimed to evaluate the effect of nursing intervention on the recurrence of vulvovaginal candidiasis infection. **Subject and Methods:** Sixty women with vaginal candidiasis infection enrolled in the study from outpatient clinic at Minia university Hospital., interview questionnaire was used to assess women's personal data, women consider to have good knowledge at score level <75% and satisfactory health habits at level of <60%. **Results:** the mean women age was 31.02±7.78. 36.7% were secondary school and majority of them (95%) were housewives. A statistical significant difference was found in the women's knowledge and health habits after implementation of nursing intervention ($P<0.05$). 18.3% recurrent infection occur after 4 weeks. **Conclusion:** There is an increase in participant's knowledge and health habits toward vulvovaginitis after applying educational intervention as compared to before intervention and also decrease incidence of VVR. **Recommendation:** Planning and implementing educational program about proper genital hygienic practices to improve women's health practice and prevent recurrence of vaginal infections.

Keywords: *Vulvovaginal candidiasis, guideline & Recurrence.*

Introduction

The female genital tract (FGT) is considered as the point of entry for a lot of pathogens for many sexually and non-sexually transmitted diseases that affect the FGT which causing vaginal discharge. This discharge is a common symptom in gynecological infection and is often the second most popular gynecological problem after menstrual disorders (Akinbami et al., 2015).

Vulva is the first line of defense to safeguard the genital tract from being infected. Contaminants often gathered in the vulvar folds, and increased moisture; sweating, menses, and hormonal variations affect vulvar microbial growth and species balance, possibly resulting in odor and vulva infection (Chen, et al, 2017)

VVC generally known to be vulvovaginal candidiasis and Candida vaginitis, which is a common problem in women worldwide caused mostly by the polymorphic opportunistic fungus Candida albicans, with 70–75 % of women suffering from symptomatic VVC at least once throughout their childbearing years, and about 40–50 % of women experiencing a recurrence of this infection (Wenxiang, 2018)

VVC is an important cause of morbidity in pregnancy which can cause abortion, candida chorioamnionitis, subsequent preterm delivery, emotional stress and suppression of immune system. Apart from the negative impact on the patient's reproductive function is the correlation between vaginal infections and

perinatal morbidity and mortality in newborns has been found. (Dermendjiev, 2014)

Recurrent vulvovaginal candidiasis (RVVC) refers to the attack of mycologically confirmed symptomatic VVC for 4 times or above within 1 year, whose incidence rate is about 5% (Wenxiang, 2018). It is manifested as pruritus vulvae, increased vaginal secretions, soybean curd-like or curd-like secretions, burning pain, dyspareunia, dysuria and other VVC symptoms. Repeated attack or ineffective treatment, make RVVC brings serious troubles to the patient's mental health, sexual life and social functions, affecting daily life and family relationship and causing a heavy psychological burden to patients.

RVVC has always been a difficulty and hot spot in VCC research, but the research on RVVC nursing has not been paid enough attention. (Xiex, et al 2014)

A self-care guideline in health promotion is considered very important, including lifestyle modification and disease prevention. It is consisting of all activities related to disease management, health maintenance, prevention, and treatment which are carried out by individuals themselves (Ebrahimi, et al., 2015).

Raising awareness and improving knowledge about self-care regarding vaginitis play a vital role in improving individuals' attitude, behavior and practice. Educating healthy practice, skills and assisting patients to acquire knowledge in order to make them follow reasonable self-care behaviors

which result in disease prevention (Safaa et al., 2018).

Unhygienic practices play an important role in VVC includes several practices as douching or washing by using strong soap. But excessive douching with alkaline pH considered one of the most widely recognized causes of VVC as it disrupted the natural equalization of the vagina (Luciene, et al., 2014).

Vaginal infections management is the nurse's responsibility to modify the practice, improving and preventing vaginal infections recurrence. The prevention requires modifying in self-care practices that pose the women to the risk of infection, and the women should be taught about the most common symptoms and risk factors for vaginal infections (Baraia, et al., 2014).

Significance of the study:

Previous Studies reported a significantly higher incidence of vulvovaginal candidiasis (10.7%) in African people (Tchana, et al., 2016). it is considered the most common reason of abnormal vaginal discharge in women at reproductive age seen by nurses (Hasnaa, et. al. 2020)

A study of fifty married women from Cairo city in Egypt, revealed that overall prevalence of reproductive tract infection was 93%, candida albicana cause 84.9% of them and 80.1% of them had recurrent vaginal infection (Eman, 2018).

Vaginal infection considered the major women's health problem so, early detection of vaginal infections, suitable treatment and appropriate precautions are important for the protection and improvement of women's health (Hamed, 2015).

Women's vulvovaginitis is a global health problem. These infections threat the women's health and may have several severe health problems, which involves, infertility, ectopic pregnancy, chronic pelvic pain, abortion and an increased risk of HIV transmission. Therefore, proper prevention and treatment of these diseases are of great importance (Samah 2019)

Results of the previous study found that there was an important relationship between following good genital hygienic practices during treatment of vaginal infection and its role in early improvement of symptoms of VVC (Abd-Elmoneen et al., 2020), So, this study highlighted the need to give greater attention towards women's genital health through health education about the importance of symptoms and prevention of infection recurrence, by using the recommended treatment and avoiding unhygienic practices found to harm vaginal health.

Aim of the study:

This study was aimed to:

Assess the effect of applying nursing education intervention on the recurrence of vulvovaginal candidiasis infection.

Research hypothesis:

Applying nursing educational intervention about vulvovaginal candidiasis will improve women's knowledge, proper practicing of self-care and prevent recurrence of infection.

Subject and Method:

Research design:

Quasi-experimental study design (pre and post-test) was used.

Sample size:

According to previous study which the sample needed 30 women increased to 60 women for statistical reason.

Study setting:

The current study was carried out at gynecological out patient's clinic at Minia University hospital. This hospital provides free service for Minia governorate in all neighborhood villages.

Tools:

An interview questionnaire was designed by the researchers after reviewing related literature, it is written in the form of closed and open ended questions, and it is used to collect data and divided into:

Part I:

This part includes sociodemographic data as, name, age, occupation, residence and level of education.

Part II: obstetrical history: including number of gravidity, parity abortions and date of last delivery or abortion.

Part III: Uses of family planning methods: it's type, duration of uses and any complications.

Part IV: Assessment of vulvovaginal symptoms through asking of women about any of vaginal infection symptoms currently present (more than one symptoms may be present).

Part V: Assessment of women's knowledge through asking women about causes of vaginal candidiasis and asking women also about actors that cause recurrence of infection, women's response to correct response which given score 2 point and 1 pint for correct and not complete answer , the wrong answer was given zero point.

Part VI: Assessment of women's health habits: women's health habits were assisted through close ended questions by asking about personal hygiene, healthy nutrition, genital area cleaning and dryness, women's health habits considered to be unsatisfactory if score >60% and satisfactory if score <60%.

Women considered to have a poor knowledge if her score >50%, and with an acceptable level of knowledge If the score between 50-75%, women considered to have a good knowledge if her score was > 75%

These parts were used twice before and after implementation of health guideline.

Nurse's education: the women were received education about the health habits that should be followed during and after treatment to prevent recurrence of infection, this education was given for each woman individually, and all women's questions were answered.

Follow-up: 4 weeks follow-up was done to assess wither the woman follow health instruction or not and assess the rate of vaginal infection recurrence. Through asking women about time of infection recurrence, women's knowledge also was reassessed for presence of infection symptoms.

Pilot study

It was carried out on 10% of the overall sample examined (6 women); It was aimed to assess the clarity of the tools and estimate the required time to fill the questionnaire, Important modifications have been made based on the findings of the pilot study, pilot study didn't included within the total study sample.

Tools Validity and Reliability

Tools were revised by a panel of three experts in the field of obstetrics and woman health nursing to test its validity. And based on their judgment, modifications were done. Reliability was done by Cronbach's Alpha coefficient test (Test-retest was repeated to the same sample of studied women on two instances) the results revealed that each of the two tools consisted of relatively homogenous items as indicated by the moderate to high reliability (internal consistency) of each tool (knowledge = 0.879 and self-care practices = 0.869).

Procedure:

Before conducting the present study, a group of national and international related literature was reviewed using text books, articles and scientific journals then an official permission was gained from the head of obstetrics & Gynecology department at Minia University Hospital after clarifying the purpose of the study.

In a face-to-face interview, the researcher met all the study participants to explain the purpose and nature of the study. A woman was instructed that the completion of the study is voluntary. Oral consent was obtained from the woman to complete the study.

Assessment

The researcher interviewed with each woman individually to obtain the personal and demographic data, obstetrical history, menstrual history, family planning history, medical history and assessment of vulvovaginal candidiasis symptoms (such as vulvar purities, Pain and Vulvar erythema), character of vaginal discharge (color, amount and odor) and her personal hygienic practices during infection episode.

Implementation of the intervention

- All participating women were counseled for providing the necessary instructions for management of vulvovaginal candidiasis and health education about the medication. The investigator instructed the women to complete the full course of treatment for 6 days even if symptoms were relived.
- All participating women were given the nursing education including (mechanism of action of drug use, possible side effect, dosage, advantages, route of administration and the technique of application). All instructions and information for the management of vulvovaginal candidiasis including: frequent underwear change, drying underwear using the sun, genital area rinsed and dried from front to back after each voiding & defecation, Use loose cotton underwear and don't use vaginal douche (douching can kill normal bacteria flora that control fungus) women given also a proper knowledge about cause of infection recurrence and to follow healthy habits to prevent infection recurrence (C.D.C., 2013).

Ethical considerations

- Approval of research proposal from ethical Committee in the Faculty of Nursing
- There was no risk for study subjects during application of the research.
- Oral consent was obtained from each patient after explanation of the aim of the study.
- The study followed the common ethical principles in clinical research.
- No incentives were given for participants.
- Confidentiality and anonymity were assured.
- Patient's privacy was considered during data collection.

Statistical analysis:

Statistical analysis was done by using Statistical Package for Social Sciences (SPSS) version 20. Data were obtained, revised, coded, organized, tabulated, and analyzed using frequencies, number, percentage T- test and correlation coefficient. Statistical significance was considered as follows:

P-value > 0.05 not significant

P-value < 0.05 Significant

P-value < 0.001 Highly significant

Results

Table (1): Distribution of women according to socio demographic data.

	No n=60	%
Age group		
Less than 25 year	16	26.7
From 25-35 year	28	46.7
More than 35 year	16	26.7
Mean \pmSD(range)	31.02 \pm 7.78(17-54)	
Residence		
Rural	57	95.0
Urban	3	5.0
Educational level		
Illiterate	21	35.0
Read and write	6	10.0
Primary	7	11.7
Secondary	22	36.7
University	4	6.7
Occupation		
Employed	3	5.0
house wife	57	95.0

Table (2): Distribution of women as regard to vulvovaginal symptoms before and after education (n=60)

	Before education		After education		P. value
	No	%	No	%	
Itching	60	100.0	35	58.3	<0.001**
Dyspareunia	35	58.3	8	13.3	<0.001**
Cheesy white vaginal discharge	59	98.3	8	13.3	<0.001**
Offensive vaginal discharge	39	65.0	3	5.0	<0.001**
Recurrent infection	57	95.0	6	10.0	<0.001**
Non Symptom	0	0.0	21	35.0	<0.001**

- Chi square test for qualitative data between the two groups

- **Significant level at P value < 0.01

Table (3): Distribution of women according to their knowledge about vulvovaginal candidiasis before and after education : (n=60)

	Before education						After education						P. value
	Complete Correct		Incomplete Correct		Wrong answer		Complete Correct		Incomplete Correct		Wrong answer		
	No	%	No	%	No	%	No	%	No	%	No	%	
Poor cleaning cause infection	58	96.7	2	3.3	0	0.0	58	96.7	2	3.3	0	0.0	1.000
Vaginal douching	1	1.7	4	6.7	55	91.7	50	83.3	8	13.3	2	3.3	<0.001**
Antibiotics	0	0.0	0	0.0	60	100.0	23	38.3	34	56.7	3	5.0	<0.001**
Contraceptive pills	0	0.0	1	1.7	59	98.3	38	63.3	22	36.7	0	0.0	<0.001**
Pregnancy	3	5.0	2	3.3	55	91.7	38	63.3	20	33.3	2	3.3	<0.001**
Stress	1	1.7	1	1.7	58	96.7	27	45.0	31	51.7	2	3.3	<0.001**
Use of warm water during vaginal douche	58	96.7	1	1.7	1	1.7	59	98.3	1	1.7	0	0.0	0.604
Using soap for wash	7	11.7	6	10.0	47	78.3	55	91.7	4	6.7	1	1.7	<0.001**
Change wet underwear	15	25.0	6	10.0	39	65.0	60	100.0	0	0.0	0	0.0	<0.001**
Avoid internal vaginal douching	3	5.0	0	0.0	57	95.0	54	90.0	5	8.3	1	1.7	<0.001**
Follow balanced diet	1	1.7	1	1.7	58	96.7	24	40.0	34	56.7	2	3.3	<0.001**
Wear cotton underwear	1	1.7	5	8.3	54	90.0	45	75.0	15	25.0	0	0.0	<0.001**
Change underwear frequently	0	0.0	4	6.7	56	93.3	58	96.7	2	3.3	0	0.0	<0.001**

Chi square test for qualitative data between the two groups

*Significant level at P value < 0.01

Table (4): Distribution of women according to their health habits before and after education for study sample (n=60)

Item	Before education				After education				P.value
	Yes		No		Yes		No		
	No	%	No	%	No	%	No	%	
Maintain dryness	1	1.7	59	98.3	57	95.0	3	5.0	<0.001**
Use soap during washing of gestational area	8	13.3	52	86.7	54	90.0	6	10.0	<0.001**
Use of daily peri- pad	1	1.7	59	98.3	47	78.3	13	21.7	<0.001**
Use cotton underwear	9	15.0	51	85.0	43	71.7	17	28.3	<0.001**
Change underwear frequently	3	5.0	57	95.0	56	93.3	4	6.7	<0.001**
Use of external vaginal douche during menses	7	11.7	53	88.3	23	38.3	36	60.0	0.001**
Change peri- pad during menses	55	91.7	5	8.3	60	100.0	0	0.0	0.022*
Change underwear frequently during menses	39	65.0	21	35.0	58	96.7	2	3.3	<0.001**
Wash of underwear carefully	18	30.0	42	70.0	55	91.7	5	8.3	<0.001**
Take ovulation induction for long time >3 years	9	15.0	51	85.0	10	16.7	50	83.3	0.803
use hormonal family planning methods>3 years	4	6.7	56	93.3	7	11.7	53	88.3	0.343
Over eat carbohydrate and sugar food content.	59	98.3	1	1.7	11	18.3	49	81.7	<0.001**
Eat foods contain elements to improve immunity (olive oil, vitamin C)	0	0.0	60	100.0	51	85.0	9	15.0	<0.001**

Chi square test for qualitative data between the two groups

*Significant level at P value < 0.05, **Significant level at P value < 0.01

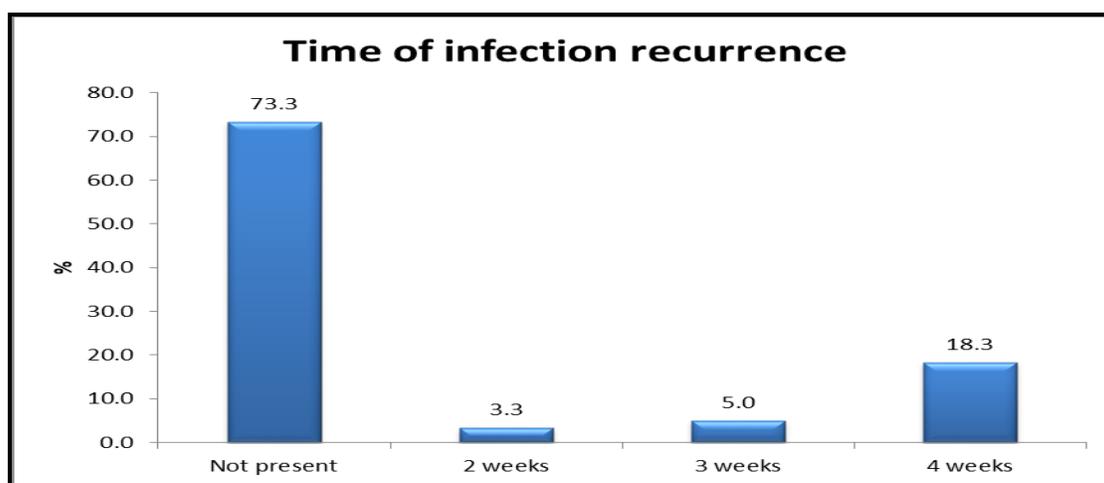


Figure (2): Distribution of women as regard time of infection recurrence after implementing educational program.

Table (5):Level of women knowledge about Vulvovaginal candidiasis before and after education.

	Max Score	Before education		After education		P. value
		No	%	No	%	
knowledge about Vulvovaginal candidiasis						
Poor	<50%	59	98.3	1	1.7	<0.001**
Acceptable	50-75%	1	1.7	4	6.7	
Good	>75%	0	0.0	55	91.7	
Mean ± SD(Range)	26	5.48±1.93(4-13)		22.60±2.84(11-26)		<0.001**

- Chi square test for qualitative data between the two groups
- Independent T-test quantitative data between the two groups
- **Significant level at P value < 0.01

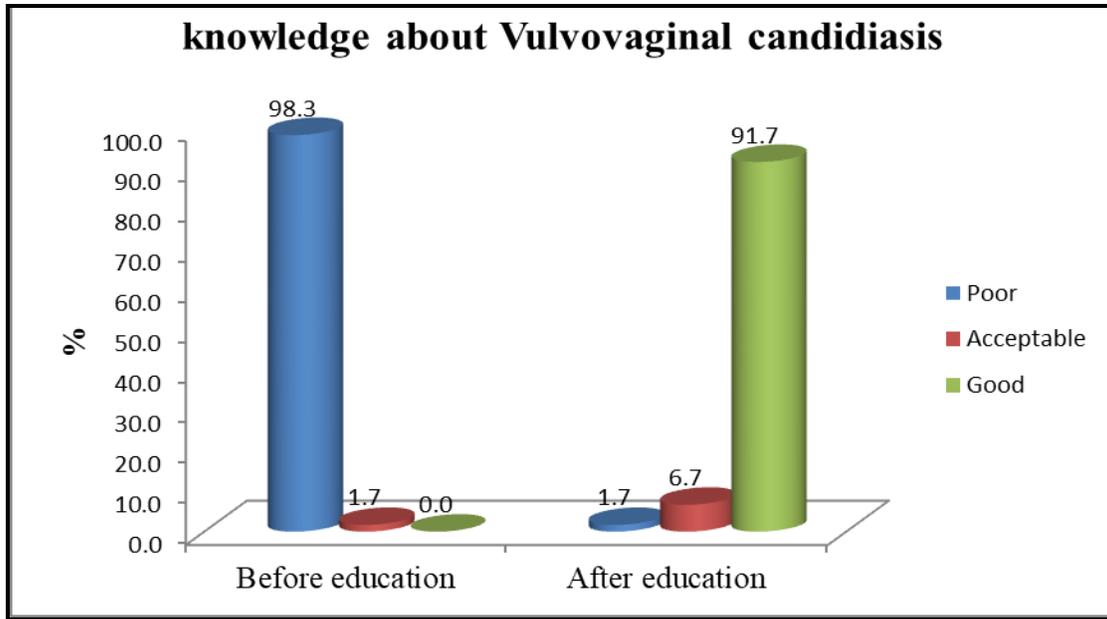


Figure (3): Distribution of women as regard level of Knowledge about vulvovaginal candidiasis.

Table (6): Distribution of women according to health habits before and after education for study sample (n=60)

	Max Score	Before education		After education		P. value
		No	%	No	%	
Health habits:						
Unsatisfactory	>60%	60	100.0	10	16.7	<0.001**
Satisfactory	<60%	0	0.0	50	83.3	
Mean±SD (range)	13	3.55±1.19(0-6)		8.87±1.62(3-12)		<0.001**

- Chi square test for qualitative data between the two groups
- Independent T-test quantitative data between the two groups
- **Significant level at P value < 0.01

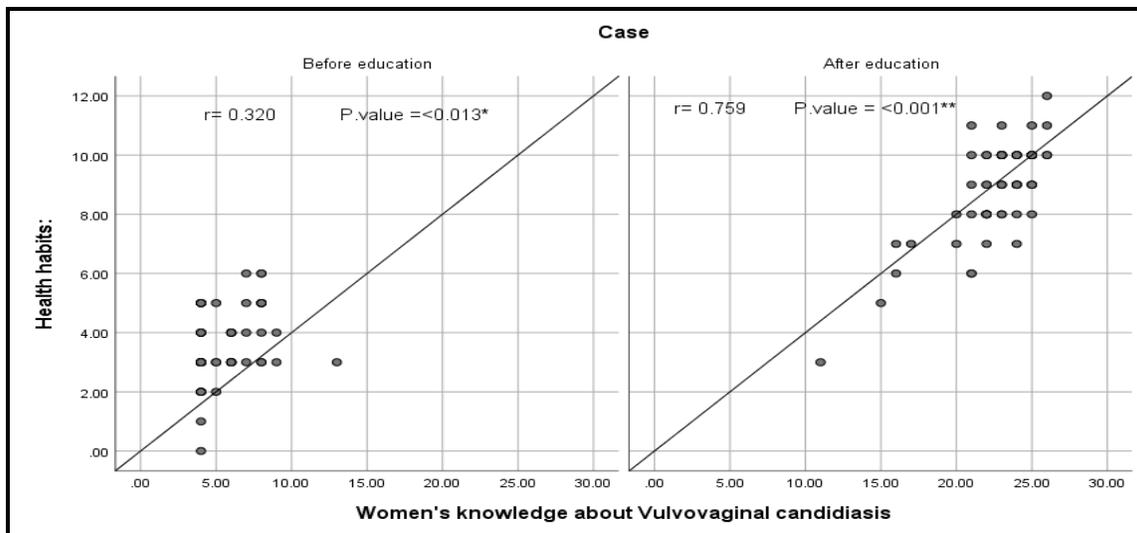


Fig (4): Correlation Co-efficient between Health habits and knowledge about Vulvovaginal candidiasis Before and After education for study sample (n=60)

- *Statistically Significant Correlation at P value < 0.05
- **Statistically Significant Correlation at P value < 0.01

Table (7): Correlation Co-efficient between health habits and women's demographic data before and after education:

Correlations		Health habits:	
		Before Education	After Education
Age	r	-.370 ^{**}	-0.203
	P	0.004	0.120
Residence	r	.283 [*]	0.067
	P	0.028	0.613
educational level	r	0.227	.527 ^{**}
	P	0.081	0.000
occupation	r	-0.153	-0.162
	P	0.243	0.217
Family income	r	0.193	.309 [*]
	P	0.139	0.016

* Statistically Significant correlation at P. value <0.05

** Statistically Significant correlation at P. value <0.01

Table (8): Correlation Co-efficient between Women's knowledge about Vulvovaginal candidiasis and women's demographic data before and after education:

Correlations		Women's knowledge about Vulvovaginal candidiasis	
		Before Education	After Education
Age	r	-.281 [*]	-0.192
	P	0.030	0.142
Residence	r	.302 [*]	0.196
	P	0.019	0.134
educational level	r	0.151	.530 ^{**}
	P	0.250	0.000
Occupation	r	-0.182	-0.169
	P	0.164	0.198
Family income	r	0.153	.400 ^{**}
	P	0.244	0.002

* Statistically Significant correlation at P. value <0.05

Table (1): This table show that mean women's age was 31.02±7.78 and ranged from (17 to 54years old, as regard educational level one third of them (35%) were illiterate and 36.7% were secondary educated while only 6.7% of them university educated. majority of them (95%) were housewife.

Table (2): This table show distribution of women as regard to vulvovaginal symptoms before and after education, it was observed a statistical significant relation as regard to infection before and after applying educational program.

Table (3): This table show women's distribution according to their knowledge about vulvovaginal candidiasis, it was observed improvement in their knowledge with statistically significant relation.

Table (4): This table illustrated the effect of health education on women's health habits it is observed improvements in women's health habits after implementation of health education guideline.

Figure (2): This figure show distribution of women as regard time of infection recurrence after

implementing educational program, it is observed that 18.3% recurrent infection after 4 weeks while only 3.3% in the first week.

Table (5): This table illustrated women's knowledge about vulvovaginal candidiasis before and after education, it is observed that an improvement in women's knowledge after implementation of educational program with statistical significant differences.

Figure (3): This figure represents distribution of women as regard Knowledge about vulvovaginal candidiasis, it is observed that improvement with statistical significant deference among women's Knowledge implementation of educational program.

Table (6): This table explores the relationship between health habits before and after education for women, it is observed statistical significant differences in women's health habits before and after implementation of program.

The main study result is improvements in women's health habits and knowledge after implementation of health education guideline.

Figure (4): This figure shows a correlation Co-efficient between health habits and knowledge about Vulvovaginal candidiasis before and after education, it was observed that a positive correlation between women's knowledge and health habits with statistical significant difference.

Table (7): This table demonstrated the Correlation Co-efficient relation between health habits and women's demographic data before and after education it was demonstrated a positive correlation between women's program educational level, family income and their health habits after implementation, and a positive correlation between these health habits and women's age, residence before program implementation also observed.

Table (8): This table demonstrated the Correlation Co-efficient relation between level of knowledge and women's demographic data before and after education it was demonstrated a positive correlation between women's educational level, family income and their knowledge after implementation of program, and also observed a positive correlation between this knowledge and women's age, residence before program implementation.

Discussion

The most common vaginal infection affecting women of reproductive age (15-49 years of age) is bacterial vaginosis (BV). It is also considered the most common type of reproductive tract infections which refers to any inflammation or infection of the vagina and external genitalia, the recurrence of this infection is ranged from 5 to 8% of women. (Samah et al., 2019).

Self-care in health promotion and lifestyle change plays an important role in management of any disease (Ebrahim et al. 2015) so; improving knowledge and awareness can affect individuals' attitude, change behavior and their practice, that will result in disease recuperation and complications control. So, this research was conducted to evaluate the effect of applying nursing intervention on recurrence of vulvovaginal candidiasis infection.

The present study findings revealed that there was a statistical significant improvement in the women's knowledge regarding all items related to vulvovaginitis after the educational intervention as compared to before intervention. The present study also showed statistically significant improvement in the women's health habits.

These results reflect the importance of education and its important role in improvement of knowledge and

practices which have an important effect on health improvement and disease cure.

The present study represents that mean women's age was (31.02 ± 7.78) and ranged from (17 to 54 years old, as regard educational level one third of them were illiterate and 36.7% were secondary educated while only 6.7% of them university educated. majority of them (95%) were housewife.

The results of the present study agreed also with Samah, et al., (2019) who found that there was great improvement in women's knowledge and health habits after educational intervention.

The current study reflect a statistical significant difference in women's habits after implementing of educational intervention, but there is no change in their health habits as regard to use of ovulation induction and use of family planning methods for more than 3 years, this related to that induction drugs and uses of family planning methods depends on medical indication rather than individual health habits.

The current study reflects that there is an improvement in women's knowledge among causes of vulvovaginal infection with statistically significant differences, but it is observed that no change in women's knowledge among role of poor cleaning and use of warm water in vaginal infection. While Improvement in the women' knowledge regarding all items related to vulvovaginitis after the educational intervention as compared to before the intervention was noticed. This finding may be due to level of women's education, more than half of them were educated with different level of education.

The present study findings showed an improvement in vulvovaginal symptoms with statistical significant differences, but itching remain the most common symptom of infection still present after application of health education which represent more than half of women, the greatest improvement in symptoms observed in disappear of offensive vaginal odor it is present in only 5% of women. This may be reflect that itching related to skin inflammation which present for long time rather than other symptoms related directly to the presence of the candida virus.

On the other hand, in her follow-up study about VVC symptoms Eman (2018) reported that 4% only of the sample had least vaginal itching, 2% of the sample had dyspareunia, no cheesy white vaginal discharge, and no offensive odor also,

Also in the study of Hasnaa et al., (2020) which conducted at Assiut city, the study results showed that there was no statistically significant difference between both groups regarding improving symptoms of vulvar pruritus and white cheesy cottage vaginal discharge in follow-up. This different in current study

finding and other studies result may be due to difference in the study sample and nature of the study. As regard to the total level of women's knowledge about vulvovaginal candidiasis before and after education, it is observed that an improvement in women's knowledge after implementing of educational program with statistically significant differences. This finding supported the research hypotheses and accepted through the findings of the previous results.

This finding is agreed with **Safaa et al., (2018)**, who conducted their study at Faculty of Nursing, El-Minia University to assess the effect of Self-Care Guidelines on Quality of Life, Knowledge and practices among Faculty of Nursing Students with vaginal Infection. they reported a significant improvement in total knowledge about vaginal infection among student sample in post-test as compared to pretest assessment.

These finding matched also with **Eman (2018)**, who conducted her study to evaluate the impact of supportive nursing guidelines on recurrence of vulvovaginal candidiasis infection during pregnancy in Cairo, Egypt, she reported that women's knowledge about vulvovaginal candidiasis was 40% raised to 94% after implementation of nursing guideline.

The current study finding reflect that the infection recurrent with high frequency after four weeks of implementing guideline which represents 18.3% of women while about three quarter (73.3%) of them still free from any signs of infection, this result explained by that some alternative therapies, such as probiotics or homeopathy, are of poor quality and have mixed results and vaginal infection mainly caused by *Candida albicans* (causes 90% of vulvovaginal candidiasis), followed by *Candida glabrata*, which isazole resistant, which cause recurrence of infection symptom. **Eman (2018)** research finding in the same line with the current study results her results revealed that most of cases did not develop recurrent episode of VVC attack during pregnancy through follow-up till term.

The present study reflects an improvement in women's knowledge level about vulvovaginal symptoms, majority of women have good level of knowledge (91.7%), while 1.7% of them still have a poor level of knowledge.

The present study showed that most of women (83.3%) have satisfactory level of practice health habits but still 16.7% of them have unsatisfactory level of practicing this habits with statistically significant differences between women's health habits before and after implementation of nursing education intervention.

The results of the present study agreed with **Safaa et al., (2018)**, who revealed that, the scores of the total practice regarding vaginal infection was significantly improved among the studied sample in post-test if compared to pretest assessment. This results supported by finding of different study which reported that an improvement in level of knowledge followed by improving in health practice.

In the current study it is observed a positive relation between women's health habits and knowledge about Vulvovaginal candidiasis before and after education, this finding support that an improvement in knowledge usually followed by improvement in performance of self-care.

The findings of the current study agreed with **Safaa et al., (2018)**. They illustrated the relation between total knowledge of the students and their total practices. The results showed that there was highly statistically significant relation between total knowledge of the students with their total practices.

Results of the present study demonstrated positive relation between health habits and women's demographic data before and after applying the guideline, it was demonstrated a positive relation between women's educational level, family income and their health habits after implementation of program, and also a positive correlation between this health habits and women's age was observed, residence before program implementation, these findings reflect the important role played by education regarding personal health habits. Residence and family income help women to seek health care which is available in urban than rural area.

Results also demonstrated the relation between level of knowledge and women's demographic data before and after education it was demonstrated a positive correlation between women's educational level, family income and their knowledge after program implementation, and also observed a positive correlation between this knowledge and women's age, residence before program implementation, Finally, from the researcher's point of view, improvement of total knowledge and total practices rendered to nursing education intervention and health education provided.

Conclusion:

It's clear that the researcher mention Findings of the present study concluded that there was a statistically significant improvement in the women's knowledge regarding all items related to vulvovaginitis after the educational intervention as compared to before intervention. The present study also reflects statistically significant improvement in the women's health habits that reflected on decreased infection recurrence rate.

Recommendations:

1. Planning and implementing necessary educational program about the proper genital hygienic practices to improve women's knowledge and health habits about vulvovaginitis reduce and prevent recurrence of vaginal infections.
2. Training programs and workshops should be conducted for training nurses about counseling women regarding the proper genital hygienic practices to improve their health and avoid recurrence of genital tract infection.
3. More studies applied on large sample size and longer period are needed to confirm the effect of nursing intervention on recurrence of VVC.

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