

Effect of Self-Perineal Care and Sider Honey on reduction of Vulvo-Vaginal Candidiasis among Adult Women.

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Abstract: Vulvo-vaginal candidiasis (VVC) is the most common gynecologic problems affecting 75% of sexually active women at least once in their life. It causes genital discomfort, loss of productivity, reduced sexual pleasure, and psychological distress. Self-Perineal care is the first line of nursing intervention to reduce vaginal infection as well honey functions as an antibacterial and effective broad-spectrum antimicrobial agent.

Aim of the study was to evaluate the effect of self-perineal care and sider honey on reduction of vulvo-vaginal candidiasis among adult women.

Method: A quasi-experimental design was adopted.

Subjects: A total of 60 women were randomly assigned to the study; two groups were constituted 30 participants for each group.

Setting: The study was conducted in the gynecologic clinic at Ain Shams university maternity hospital, Egypt.

Tools: Two tools were developed, and used by researchers to collect the data; a structured interviewing questionnaire and self-reported symptoms assessment questionnaire. In addition to, a supportive material of self-perineal care instruction and technique of Sider honey (5ml) with a concentration of 80% was applied vaginally twice/day for 7 days.

Results: revealed that the mean age in women who applied self-perineal care and Sider honey was 25.3 ± 5.02 years old. Eighty six point six percent (86.6%) of clinical cure rate was observed in self-perineal care and Sider honey group compared to standard routine care group. In addition, self-reported symptoms were minimized in honey group than standard routine care group with statistically significant difference.

Conclusion: Self-perineal care and applying Sider honey was effective on reduction of vulvovaginal Candidiasis among adult women with highly statistical significance difference between pre and post-treatment in relation to; vaginal discharge, external vaginitis, non-menstrual bleeding, rash, and vulvovaginal redness.

Recommendations: Replication of the study on large sample to generalize the findings. Further research is needed to assess the efficacy of honey as an inhibitor of candida growth in clinical trials.

Key words: Vulvo-vaginal candidiasis (VVC), Sider honey, Self-Perineal Care, Standard routine Care.

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I. Introduction

Vaginal infection is a common cause of genital discomfort for reproductive aged women, and is the second reason for women to seek medical help after menstrual disorder⁽¹⁾. About seventy five percent (75%) of all women develop vaginal infection at least once during their life; ninety percent (90%) of this infection is caused by *Candida albicans*. Vulvovaginal candidiasis (VVC) is a common gynaecologic problem affect reproductive aged women throughout the world particularly in hot, subtropical climates. Annually in the United States there are approximately 13 million cases of vulvovaginal candidiasis (VVC), resulting in 10 million gynaecologic offices visits per year.⁽²⁾

Every year, this infection that caused by *Candida* kinds, affects millions of women worldwide. VVC has a broad manifestations ranging from asymptomatic to severe acute symptomatic infection. About 10 to 20% of the affected women are asymptomatic vaginal carriers; this infection may be increased to 40% during pregnancy.^(2,3) The risk of developing Vulvovaginal candidiasis increases with higher glycogen content and higher estrogen levels in vagina. Pregnancy, uncontrolled diabetes, glucocorticoids use, hormone replacement, antibiotics, immunosuppression increase the risk of VVC. Behavioral risk factors include some habits of clothing, hygiene, and sexual practices and contraceptives practices^(4,5).

Vaginitis with *Candida* is manifested by vulvar burning and pruritus accompanied by irritation and vaginal soreness leading to dysuria and dyspareunia. Vulvovaginal oedema, erythema, and fissures are also commonly found in women with VVC. Women also complain of thick white caseous (curd-like) vaginal discharge and itching, great genital discomfort, mental distress, anxiety, altered self-esteem, , impairing work performance and interfering with sexual and affective relations. ⁽⁶⁾ Honey according to Quran has great curing power against diseases. So using of honey is a real glory treatment in Islam. According to **Beretta, Caneva, Facino** ⁽⁷⁾, evidence indicate that some kinds of honey contain kynurenic acid (a tryptophan metabolite with neuroactive activity) which may contribute to its antimicrobial properties. Honey includes enzymes such as glucose oxidase, invertase, diastase, catalase, phosphatase, and peroxidase that contribute to inhibiting growth of candidiasis ⁽⁸⁾. Many studies report that honey is very effective in the dressing of wounds, skin ulcers, burns, and inflammations; the anti-bacterial properties of honey speed up the growth of new tissues that help in wound-heal and it has variable broad-spectrum activities against different kinds of gram-positive and enteric bacteria. ^(9,10) Furthermore, clinical trials and laboratory studies have shown that honey is an effective broad-spectrum antimicrobial agent ⁽¹¹⁾.

Since the ancient times, honey has been used as part of a traditional medicine. It functions as an antioxidant, anti-inflammatory, antibacterial, antiviral, and antitumor. ⁽¹²⁾ In addition to Honey's valuable nutrient contents, it is a drug and it was valued highly in the Middle East. ⁽¹³⁾ It contains numerous compounds such as proteins, organic acids, minerals, amino acids, vitamins, polyphenols, and aroma compounds. Furthermore, it contains significant antioxidant activity including glucose oxidase, ascorbic acid, flavonoids, catalase, phenolic acids, carotenoid derivatives and other. ^(14,15) The diluted Honey generates hydrogen peroxide which is the major contributor to the antimicrobial activity of honey. ^(16,17) Sider honey is deemed the finest and the best quality in the world because the bee builds its hives without human interference, thus it maintained its specification and vital enzymatic constituents. Otherwise, it has a potent analgesic, antipyretic, and anti-inflammatory properties, which may be related to the presence of phytochemicals. In addition to the continuous elaboration of hydrogen peroxide from the honey through the glucose oxidase action. ^(18, 19) Although several studies have demonstrated the antibacterial activity of honey, there was a limited number of research studies that studied the activity of honey against fungi. ^(20,21)

In a study by Al-Wailli, ⁽²²⁾ a mixture of honey, beeswax, and olive oil was effective in reducing the symptoms of dermatitis, and eradicated *C. albicans* from 50% of the culture-positive patients, during the seven-day trial. Furthermore, in a study by Mercan et al., ⁽²³⁾ honey exhibited high anti-candidal activity on *C. albicans*, *P. aeruginosa*, *E. coli*, and *S. aureus*.

Nurses play an active role as health educators and counselors. They have to deliver paramount health educational instructions and guidance to women such as personal hygiene, eating a healthy diet, which increase their immunity, and how to apply effective perineal care and sider honey vaginally. The Health professionals should perform the careful assessment for women with vaginal infection as observing signs and symptoms of vaginal Candidiasis, and presence of risk factors as improper personal hygiene, pregnancy, usage of antibiotics, passive smoking, diabetes mellitus, and immunosuppressive condition. The health professionals who are caring for women during their reproductive age in healthcare settings should give them knowledge and increase their awareness, which consequently helps women in improving their health by adopting preventive measures that help in reducing the incidence and avoid the complications of VVC ⁽²⁴⁾.

Significance of the study

Recently, treatment of vaginal infection with the use of metronidazole or clindamycin administered orally or intravaginally is associated with poor initial cure rates in 10% to 15% of patients and recurrence rates of up to 80% in those who show initial response. ⁽⁸⁾ The extensive use of azoles may effectively suppress *Candida albicans* but facilitate the overgrowth of non-*albicans* *Candida* ^(1,4). Furthermore, it can cause several adverse effects as vomiting, diarrhea, abdominal pain, urination, pelvic cramps, dysmenorrhea, paresthesia, rhinorrhea, headache and dizziness, fever, chills, vaginal burning, stinging, itching and irritation. ^(25,26)

In Kingdom of Saudi Arabia, primary health care center is still lacking and there is gap in knowledge regarding incidence, causes and line of management of vaginal discharge. In addition, through the clinical experience it was observed that vaginal Candidiasis is a common type of vaginal infection, and is the most common reason for seeking medical care at the later stages of illness when the symptoms are aggravating. VVC is rarely life threatening, and therefore, it is vastly under studied and poorly understood. VVC causes genital discomfort, loss of productivity, reduced sexual pleasure, and psychological distress. Also in Egypt, the VVC is a very sensitive problem among females because they had the belief that vaginal thrush may cause great misery and embarrassment. Honey is one of the new antifungal strategies for treating VVC. In addition, there is a

scattered research and low evidence based research that assess the effect of applying Sider honey in treating vaginal infection more specifically VVC. Therefore, the present study will add to the body of knowledge and evidence based regarding the use of honey as an alternative medicine strategy with self-perineal care in treating vaginal infection compared to the standard routine care in the treatment of VVC.

Aim of the study: to evaluate the effect of self-perineal care and sider honey on reduction of vulvo-vaginal candidiasis among adult women.

Research Hypotheses:

To fulfill the aims of the current study the following research hypotheses are formulated

H1. Application of Self-perineal care and Sider honey will have a positive effect on reduction of vulvo-vaginal candidiasis among women than standard routine care.

H2. Women with VVC who will apply self-perineal care and Sider honey, will report less vaginal infection symptoms than those who do not.

II. Subjects and Method

Research Design:

A quasi-experimental design, pretest-posttest was used to achieve the aim of the study. In this design, data were collected from the participants both before and after treatment.

Setting:

The study was conducted at gynecological clinic at Ain Shams university maternity hospital, Egypt. It is a university-affiliated Hospital, which provides free health care to maternity as well as gynecological clients. Gynecological outpatient department clients are from all over Egypt including upper and lower areas.

Sample:

A total of 60 women were randomly assigned to the study. The rule of sum and sample equation based on information from relevant studies and the last year hospital admission statistics were used to determine the sample size of the study. The sample size was calculated according to the following statistical formula;

$$n = \frac{t^2 \times p(1-p)}{m^2}$$

n = required sample size

t = confidence level at 95% (standard value of 1.96).

p = estimated prevalence of vulvo-vaginal candidiasis.

m = margin of error at 5% (standard value of 0.05)

The inclusion criteria were women suffering from vaginal discharge associated with the following symptoms; itching, burning vaginal feeling, dyspareunia and dysuria, and vaginal sample were positive for *Candida* spp. Pregnant women with bacterial vaginosis or trichomoniasis, use of intravaginal antibiotics or antifungal agent were **excluded**. The sample was randomly assigned to two groups 30 for each. Group (A) is composed of the women who received self-perineal care and Sider honey as the treatment of vulvo-vaginal candidiasis and group (B) is consisted of 30 women who will receive standard routine care.

Tools and measurements:

To collect data pertinent to the study, two tools were constructed and used by the researcher after reviewing related literature. These are (1) A structured Interviewing questionnaire, (2) Self-reported symptoms assessment questionnaire, and follow-up.

(1) A Structured Interviewing Questionnaire, included data related to personal background, medical history; and obstetric history. It was written in Arabic and simple language to be easy understood for all the participants.

(2) Self- Reported Symptoms Assessment Questionnaire, which, include data related to symptoms of vaginal infection as, vaginal discharge, external vaginitis, non-menstrual bleeding, rash, vulvo-vaginal redness, follow up before and after applying Sider honey and vaginal swab result. Women response to the question regarding symptoms and risk factors of VVC **were scored** as (1) for answer with (yes) and (0) for answer with (no).

Supportive material

A pamphlet was designed by the researchers in a simple Arabic language contains brief knowledge on vaginal infection with vulvovaginal candidiasis, symptoms, and how to apply sider honey. The pamphlet was disseminated to each woman after data collection and before applying the self-perineal care and sider honey. The aim of this Pamphlet was to help the women to remember what the researchers said and raise their awareness regarding applying perineal care and sider honey to reduce the vulvovaginal infection. It was supplemented by photos and illustration to help the women understand the content. Also, it was tested for its content validity by a jury of three experts in nursing and medical fields to ensure the content comprehensiveness, clarity and applicability.

Tool validity and reliability:

Tools were submitted to a panel of five experts in the field of Maternity Nursing and Obstetric Medicine to test the content validity. Modifications were carried out according to the panel judgment on clarity of the sentences and appropriateness of the content. The questionnaire items of the present study were proven reliable where $\alpha = 0.7$.

Pilot Study:

A total of 10% of the study sample was included in the pilot study in order to assess the feasibility, clarity of the tool and determine time needed to answer the questions. It was excluded from the total sample.

Ethical consideration

Each woman was informed about the purpose of the study and its importance. Researchers emphasized that participation in the study was entirely voluntary. Anonymity and confidentiality were also assured through coding the data. An informed written consent was obtained from the women who met the criteria of inclusion and accepted to be included in the study. All women were informed that they can withdraw any time from the study without affecting their care and their data will be anonymous and be used only for the purpose of this study.

Procedures:

Before conducting the study, permission was obtained from the obstetric department in the previously mentioned settings followed by obtaining acceptance from the women to participate in the study. Ethical committee provided approval of the study and a written consent was obtained from all participants in advance.

Data collection carried out through three phases: assessment, implementation, and evaluation phase.

1)-Assessment phase:

In This phase, a base line data was obtained from the women in both groups. Women were asked about their personal background data as age, educational level, marital status, residence and occupation. All of them were assessed for vaginal discharge. Medical history, physical examination, and laboratory investigations were performed for women who were diagnosed as having vaginal infection. A cotton swabs was obtained from the women vaginal discharge, the collected swabs were examined microscopically for detection of *Candida albicans*. All cultures were examined at least weekly for detection of the fungal growth and were kept for 6 weeks before being considered as negative was done by microbiology investigator specialist.

Preparation of honey solutions by microbiology investigator specialist

Honey solution was prepared in the laboratory by diluting honey in Physiological saline (pH 7.2) to obtain the suitable concentration (70 % or above) for application. According to the method described by ⁽²⁷⁾.

2)-Implementing phase:

In this phase, the selected women were randomly assigned into two groups (30for each).The first group comprised of 30 women who were encouraged to apply self-perineal care and using sider honey. The Sider honey was prepared by pouring the honey into a container having heated distilled water to 40°C for mixing to make the honey 80% diluted, which was done by microbiology investigator specialist. The mixture contained (80%) honey and (20%) distilled water, this mixture was kept in sterile bottles then was given to the participants to be used at home. Women were instructed to use the mixture vaginally 5ml twice daily for 7 days. **Written, and oral instructions** on women's self-care, and the proper technique for the prepared solution were provided; as the following; **1)** Instruct women to wash her hands before and after each Perineal care, **2)** Squeeze peri bottle (fill the bottle with cleaning warm water) or pour warm water or cleansing solution over perineum without separating the labia, **3)** Instruct the woman how to pour the antiseptic solution over her Perineal area and ensuring that the solution flow from the front to the back, **4)** Dry the Perineal area with dry tissue from front to

back, and then discard it (disposal tissue preferable to prevent infection). Finally, **5**)—Apply the diluted solution of 5 ml Sider honey directly into vagina by using probe twice daily for one week. Women were followed-up to comply the instructions via telephone call and the next visit to take the swab.

After completion of this group, the next group comprised of 30 women who were using standard routine care (**control group**). The researchers dealt with each woman in control group during attending gynecological clinic and receiving the routine hospital care for vaginal infection. Answering any question and the same baselines and following up assessments were conducted as those of the Sider honey.

3)-Evaluation phase:

In this phase, all women recruited in the study, were evaluated for the presence of itching, and/or discharge after treatment by one week. Vaginal examination was done and swabs from the vaginal discharge were obtained and evaluated as well as culture on to determine effectiveness of self-perineal care and sider honey compared to standard routine care. The researchers kept on a continuous telephone contact with the women to follow up them.

Statistical Analysis

Statistical Package for Social Science (SPSS), version 20 was used for the analysis of the data. Collected data were coded and entered into computer. Data were examined for coding and entering error. Data were analyzed through inferential statistics which used to answer research questions. In this study, chi-square was used to compare between the categorical variables and differences between groups. Statistical significance was considered at p-value <0.05.

III. Results

Findings of the current study was presented in three main parts: 1) Socio-Demographic Characteristics of women; 2) women's reported predisposing factors for the occurrence of vaginal infection; and 3) Self-reported symptoms of vaginal infection before and after applying self-perineal care and Sider honey versus standard routine care.

1) Socio-Demographic Characteristics of women

women age ranged from 19-48years old with mean age 25.30 ± 5.02 years in the study group (A) who apply self-perineal care and Sider honey compared to 27.37 ± 7.33 in standard routine care group (B). Most of women in both groups were married. **Regarding to educational level**, about two third of the women at group (A) had high education compared to about one third of the women at group (B). All women in group (A) were resident in urban area compared to two third in group (B). As regard women body mass index, two third of group (A) had normal weight compared to almost one third of group (B), while, low percentages in both groups were overweight (**Table, 1**).

2) Women's reported predisposing factors for the occurrence of vaginal infection:

Concerning predisposing factors for developing vaginal infection; it was found that, (40%) of women in group (A) compared to (43.3%) in group (B) were passive smokers. While, (30%) of women in group (A) compared to (36.67%) in group (B) were using Contraceptive Practices. Moreover, (16.67%) of women in both groups were anemic (**Table, 2**).

3) Self-reported symptoms of vaginal infection before and after using sider honey.

As regard, women self-reported symptoms among the both group. **Table (3)** revealed that there is a highly statistical significance difference between the two groups in relation to the self-reported symptoms of rash and itching at (P= 0.000), while there is no statistical significance difference between the two groups in relation to vaginal discharge, external vaginitis, burning sensation and non-menstrual bleeding.

Regarding to women self-reported symptoms after applying self-perineal care and sider honey treatment in (Group A); **Table (4)** illustrated that there is a highly statistical significance difference was found before and after applying self-perineal care and diluted solution of Sider honey treatment in relation to ; vaginal discharge , external Vaginitis, non- menstrual bleeding, rash , and vulvo-vaginal redness at (p= 0.000). In addition, figure (1) illustrated that vaginal discharge, burning sensation and itching were reduced more effectively in (Group A) than (Group B).

Table (1): Socio-Demographic Characteristics of the Studied Sample.

Items	Group (A) (n=30) Self-perineal care and Sider Honey		Group (B) (n=30) Standard routine Care	
	N	%	N	%
Age (M±SD)yrs. Old	25.30 ± 5.02		27.37 ± 7.33	
Educational level				
Low education	6	(20.0)	9	(30.0)
Moderate education	0	(0.0)	10	(33.33)
High education	24	(80)	11	(36.67)
Residence				
Urban	30	(100)	19	(63.3)
Rural	0	(0.0)	11	(36.6)
Marital status				
Single	0	(0.0)	1	(3.33)
Married	25	(83.34)	24	(80)
Widow	4	(13.33)	4	(13.34)
Divorce	1	(3.33)	1	(3.33)
BMI category				
Under weight	0	(0.0)	1	(3.33)
Normal weight	20	(66.67)	12	(40)
Over weight	6	(20)	9	(30)
Obese	4	(13.33)	8	(26.67)
B M I (M±SD)	24.11±4.90		25.45±4.46	

Table (2): Distribution of the studied group according to risk factors.

Variable	Group (A) (n=30) Self-perineal care and Sider Honey		Group (B) (n=30) Standard routine care	
	N	%	N	%
Passive smoker	12	(40)	13	(43.33)
Being pregnant	2	(6.67)	7	(23.33)
Contraceptive Practices	9	(30)	11	(36.67)
Diabetes Mellitus	1	(3.33)	2	(6.67)
Anemia	5	(16.67)	5	(16.67)

Women reported more than one risk factors.

Table (3): Distribution of Self- reportedsymptoms of Vulvovaginalcandidiasis among studied groups.

Variable	Group (A)(n=30) Self-perineal care and Sider Honey		Group (B)(n=30) Standard routine care		X ²	p-value
	N	%	N	%		
Vaginal discharge	25	(83.3)	19	(63.33)	3.06	0.08
External vaginitis	20	(60)	18	(60)	1.20	0.27
Burning sensation	11	(36.67)	13	(43.33)	0.27	0.59
Non-menstrual bleeding	11	(36.67)	6	(20)	2.05	0.15
Rash	27	(90)	7	(23.33)	27.14	0.000*
Itching	19	(63.33)	5	(16.66)	13.61	0.000*

Women reported more than one symptom.

*Highly statistically significant differences at (p ≤ 0.001).

Table (4): Distribution of women Self- reported symptoms of vaginal infection before and after application of self-perineal care and sider Honey.

Variable	Self-perineal care with Sider Honey (Group) (n=30)		X ²	p-value
	before application N %	After -Application N %		
Vaginal discharge	25 (83.3)	3 (10%)	13.33	0.000*
External Vaginitis	20 (60)	(0) 0.0	6.53	0.001*
Burning sensation	11(36.7)	(0) 0.0	2.13	0.14
Non-menstrual bleeding	11(36.7)	(0) 0.0	2.13	0.000*
Rash	27 (90)	1 (6.7)	19.2	0.000*
Itching	19(63.33)	0 (0.0)	2.13	0.14
Vulvo-vaginal redness	20 (66.7)	2 (6.7)	3.33	0.000*

*Highly statistically significant differences at (p ≤ 0.001)

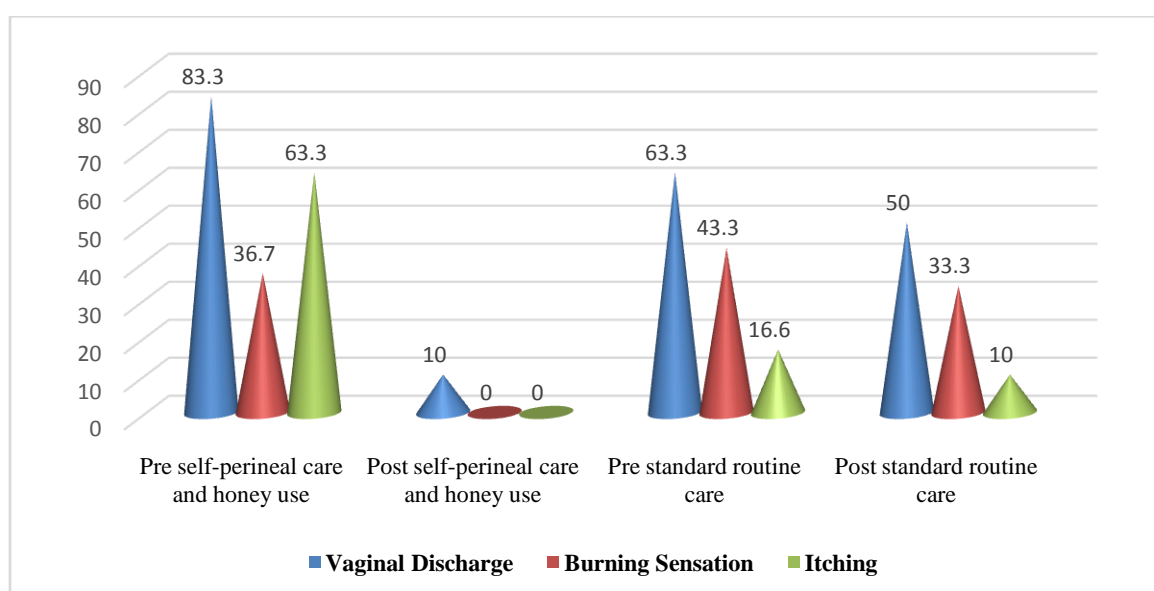


Fig. (1). Self-reported symptoms among both groups before and after treatment

IV. Discussion

Vulvovaginal infection (VVC) affects an approximation of (70) to (75%) of adult women, at least one episode occurs during their life. It is considered that Sider honey is the finest and best quality in the world for treating vaginal infection. Therefore, the present study was conducted to evaluate the effect of self-perineal care and sider honey on reduction of vulvovaginal candidiasis among adult women. The present study findings was discussed within the following frame of references:1) Socio-Demographic Characteristics of women; 2) Women’s reported predisposing factors forthe occurrence of vaginal infection; and 3) Self-reported symptoms of vaginal infection before and after applying self-perineal care and sider honey versus standard routine care.

Regarding socio-demographic characteristics, the women age ranged from (19-48) years in self-perineal care and sider honey group and the standard routine care group with a mean of 25.30 ± 5.02 and 27.37 ± 7.33 respectively. This finding was similar to a study conducted by **Pirotta et al**⁽²⁸⁾ who reported that (73%) of women diagnosed with VVC from 1117 women their age ranged from 18-70 years. In addition to another study conducted by **Foxman and his college**⁽²⁹⁾ mentioned that, (6.5% to 8%) of women who older than 18 years associated with More than or equal one occurrence VVC. In a contrary, **Reid et al**⁽³⁰⁾ had shown that an age of 33 years old is common for recurrent cystitis and VVC. This difference may be due to women cultural differences as most of them were from a rural area with different socioeconomic status. In addition, it may be related to the difference in sample size.

Also, in the current study, two third of the women received high education in the group of self-perineal care and sider honey group compared to less than one-third of the women received secondary school in standard routine care group. Regarding women body mass index, a two-thirds and almost one-third of them in the self-perineal care and sider honey group, and the standard routine care group respectively, had a normal body weight. Moreover, a low percentage in both groups had overweight.

Concerning the reported predisposing factors for the occurrence of vaginal infection, in the present study, the Potential risk factors for vulvovaginal candidiasis included; being a passive smoker, using contraceptive methods, pregnancy, anemia and diabetes mellitus. This finding was inconsistent with **De Leonan et al.**⁽³¹⁾ who illustrated that VVC risk factors were previous history of VVC, oral contraceptive pills, a vaginal douche or use of commercially available solutions for genitalia cleansing, contraception devices (intrauterine device, diaphragm, and vaginal contraceptive sponge), a frequent sexual intercourse, sexual behavior, and antibiotics. Moreover, women with a history of bacterial vaginosis and younger women were at increased risk of vulvovaginal candidiasis episodes. In contradictory with **Another study found that** the behavioral factors that were associated significantly with increasing vulvovaginal candidiasis recurrence of More than or equal two fold encompass wearing pantyhose or panty liners and consuming acidophilus-containing products or cranberry juice⁽³²⁾.

Furthermore, **Vallianou and his college**⁽³³⁾ concluded that antibiotic use and sexual activities contributed to the development of candidiasis in the women. As well as, CDC reported that⁽³⁴⁾ in the USA Candidiasis is one of the most familiar forms of vaginitis associated with discharge. The high prevalence among women may be attributed to self-report douching (28.6%), sexual activeness (32.1%) and antibiotic use (50.0%) which was the main risk factors reported in the study. These findings may be related to low levels of personal hygiene among the participants and insanitary conditions in the boarding house could have contributed to the high incidence of candidiasis.

The differences between the current study findings and the other studies findings may be due to Arab women are ashamed to report that the cause of their vaginal infections is due to lack of personal hygiene or sexual activity without preparation.

Concerning Self-reported symptoms of vaginal infection before and after applying Self-perineal care and Sider honey versus standard routine care. The results revealed that self-report vaginal infection as; external vaginitis, vaginal discharge, non-menstrual bleeding, burning sensation, and itching were improved after applying self-perineal care and sider honey compared with standard routine care. With high percentages of clinical cure rate after applying self-perineal care and 80% diluted sider honey for ten days. This finding was supported by **Irish et al.**⁽³⁵⁾ who reported the antifungal efficacy of various honey against clinical isolates of *C. albicans*, *Candida dubliniensis* and *C. glabrata*. Also, **Khosravi et al.**⁽³⁶⁾ reported that honey has antifungal activity against *Candida* species such as *Candida albicans*, *C. tropicalis*, *C. parapsilosis*, *C. glabrata*, *C. Candida kefir*, and *dubliniensis*.

Our finding is consistent with that of **Grigoriou et al.**⁽³⁷⁾ who reported pruritus or itching (85.5%) is the most common symptom followed by vaginal discharge (66.1%). In the contradictory line, women complained of vaginal infection symptoms such as; vaginal discharge, burning sensation, and itching, who were on antibiotic treatment, were tested positive for *Candida*.^(37,38)

In the current study finding, an applying of self-perineal care and 80% diluted sider honey was more effective on reduction vulvovaginal candidiasis among women than women who receive standard routine care. This finding is inconsistent with **Banaeian-Borujeni et al.**⁽³⁹⁾ who mentioned that a concentration of 80% of honey had the greatest inhibitory effect against VVC. According to **Banaeian-Borujeni et al**; **Koc et al.**^(39,17) showed that Sider honey had antifungal activity at a concentration of 80% as compared to fluconazole. A study was **done by Al-Waili et al.**⁽²²⁾ mentioned that honey inhibited the growth of *Candida* at 30-100% concentration in nutrient agar media. This may be related to sider honey at 80% generates hydrogen peroxide when diluted because of the activation of the enzyme glucose oxidase, which oxidizes glucose to gluconic acid. As well, hydrogen peroxide has a major contributor to the antimicrobial activity against VVC.

This result is contradictory with **Al-Waili**⁽²²⁾ who found that honey concentration ranging from 30% to 50% is effective to inhibit the growth of *C. albicans*. **Irish et al.**⁽³⁵⁾ reported that Sider honeys worked as antifungal efficacy against clinical isolates of *C. albicans*, *Candida glabrata*, and *Candida dubliniensis*. In the same line, **Khosravi et al.**⁽³⁶⁾ mentioned that honey has antifungal activity against *Candida* species such as *C. albicans*, *Candida parapsilosis*, *Candida tropicalis*, *Candida kefir*, *Candida glabrata*, and *Candida dubliniensis*.

V. Conclusion and recommendation

The current study results revealed that self-perineal care and sider honey (80%) was effective on reduction of vulvovaginal candidiasis among adult women. There is a highly statistical significance difference between the women who applying self-perineal care and sider honey as compared to standard routine care in relation to the self-reported symptoms of vaginal infection. Moreover, there is a highly statistical significance difference between before and after treatment by applying self-perineal care and diluted solution of Sider honey in relation to ; vaginal discharge , external Vaginitis, non- menstrual bleeding, rash , and vulvovaginal redness. Applying self-perineal care and sider honey appears to be the useful and safe management of candidates, not only because of their effectiveness but also because of their safety with no adverse effects.

Based on the study findings the following recommendations are suggested:

- (1)- Replicate the study with large sample size and different settings.
- (2)- Nurses in gynecological clinic should provide personal self-care instructions as routine care to minimize vaginal infection.
- (3) Further extensive and intensive studies are needed in this area.

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