

Original Article

The relationship between family planning methods, individual hygiene, and fertility with vaginal infections among the women referring to selected health centers in Isfahan city

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Abstract

BACKGROUND: With regard to the high commonality of vaginal infections among pregnancy-age women, especially gardnerella, candidiasis vaginitis, trichomonal vaginitis and chlamydia and by attending to this fact that these infections have a high cost, including the medical expenses and other services like missing working hours and bear a negative effect on the life quality of women as influential individuals in family and society, we decided to examine the commonality of some of these infections and their related factors among women referring to selected health centers in Isfahan City.

METHODS: This research was of an analytical-descriptive type conducted on 266 samples referred to the midwifery unit of selected health centers in Isfahan City due to one of the common vaginal infections (gardnerella, candidiasis vaginitis, trichomonal vaginitis and chlamydia). The collection of data was carried out via conducting interview with women and filling out the researcher-made questionnaire with close-ended answers (38 questions) and open-ended answers (25 questions). Data analysis was done by descriptive and analytical statistics (variance analysis and chi-square test).

RESULTS: The findings of the study showed a significant relationship ($p = 0.04$) between suffering from different kinds of vaginal infection and fertility factors (the treatment record of the spouse). But, there was no significant statistical relationship between suffering from these infections and delivery type, period regulation, seeing stains and the pregnancy prevention type. Meanwhile, a significant relationship was found between suffering from vaginitis and demographic and individual factors like women's job ($p=0.001$), their educational level ($p = 0.006$), body mass index ($p = 0.01$) and their weight ($p = 0.02$). However, no significant relationship was found between suffering from common vaginal infections and individual health factors.

CONCLUSIONS: With regard to the research findings, knowledge of the factors related to vaginal infection, including the fertility factors, can be instrumental in preventing and reducing the suffering from these infections. Therefore, training related to mothers' educational level and consulting with women for knowing the susceptibility factors like the effect of weight, attending to mothers' professional issues and prevention methods by following individual and sexual health-related issues by men and women can reduce the rate of suffering from these infections and promote the health level of mothers and hence, the society's health status.

KEY WORDS: Vaginal infections, fertility, individual hygiene.

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One of the common diseases among women at the age of fertility is the infections of the reproductive system. There are different kinds of these infections

which are categorized into two major groups: those which are sexually transmitted and those which are brought about by endogen fluoride. Vaginitis is the commonest gynecological prob-

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lem that women seek its treatment.¹ Its symptoms includes an outburst in vaginal secretions, vulvae irritation and stimulation, urinal burn, and malodorant secretions. The women suffering from infectious vaginitis are either inflicted with sexually transmitted diseases (trichomonal vaginitis) or with an increased in the amount of vaginal fluoride thermal bacteria (like gardnerella, candida, anaerobic).²

Identifying the real frequency of vaginitis is a tough task due to the variety of effective factors on it. Gor reported the rate of vaginitis in 2006 as 5 to 15 percent in American women clinics and 32 to 64 percent in STD clinics. They also stated that the universal prevalence of vaginitis is not truly clear but it is probably the same as the that in America.³ There are at least four kinds of infectious vaginitis which include bacterial vaginitis, candidiasis, trichomitis, and gonococcal.²

Bacterial vaginitis is the main cause of vulvovaginitis.⁴ This infection is identified with a bad odor and profuse secretions (fish-like smell or yeast). These secretions are steady, grayish white to yellowish white and stick to the vulvae sides and vagina.¹ It is believed that one of the main reasons for suffering from bacterial vaginitis is the frequent alkalization of vagina resulting from frequent sexual intercourses.⁵

Candidiasis is the second common vaginal infection. The main signs of candidiasis are irritation or stimulation or both. Vaginal secretion is like coagulated cheese, in a strong, white-like and profuse amount.¹ Factors like age, pregnancy condition, sexual relations, diabetes, the weakness of the immune system, using antibiotics, mechanical factors and wearing tight nylon clothes are among the facilitating factors that cause this infection.⁶

Trachomatous vaginalis is a flagella parasite which is sexually transmitted.⁵ The symptoms of the disease are usually maximized immediately after the initiation of periodical bleeding which include profuse fume-like secretions, pain and topical stimulation.¹

Chlamydia has been known as the commonest sexually transmittable infection in the US.⁷ It

is an inner cellular parasite. Among the facilitating factors for this infection are the start of sexual activity under the age of 25, consuming contraceptive pills and low economical situation.⁸

Some pregnancy prevention methods can make the individual susceptible to vaginal infections. In "infectious diseases of the female genital tract" book, it has been said that the likelihood for the presence of fungus in the secretion culture of women who use contraceptive pills (OCP) is high.⁹ Besides, the likelihood for chlamydia infection increases in OCP consumers.¹⁰ In contrast, Holzman et al reported through a study in 2001 that the women who had used hormonal pregnancy prevention methods in the last 6 months showed a 50 percent decrease in suffering from bacterial vaginitis.¹¹ Considering the conducted studies in different countries, the examination of fertility factors related to the appearance of kinds of vaginal infections can be useful in identifying proper strategies to reduce the suffering from these infections.

Following the principles of individual hygiene has a significant effect on the rate of suffering from different infections, especially, vaginitis. As Holzman et al stated in 2001, the prevalence of bacterial vaginitis in women who regularly take a shower (2 times or more) is 28% and among those who seldom take a shower is 53%.¹¹

Demographic and individual factors are also effective in suffering from different kinds of diseases. Increase in age would significantly reduce the risk of chlamydia infection; so that females over 30 years would have the lowest rate of chlamydia infection.¹² Behrouzi stated in his study in Tehran in 1995 that there is a significant relationship between marriage age and suffering from chlamydia infection.¹³ It was reported in a study in 2005 in Darosalam, Tanzania that there is a reverse relationship between occupation and chlamydia vulvovaginitis.¹⁴ Holzman et al stated in 2001 that bacterial vaginitis had a low prevalence among women who have 13 or more years of education.¹¹ Paul et al stated in their study that having a low income has a strong relationship with bacterial vaginitis among African-American women.¹⁵ This study

indicates the necessity to examine the effect of demographic factors on suffering from vaginitis.

Since the rate of women referring to treatment-hygiene centers for diagnosing and treating the vaginal infections is very high, and by virtue of the spending a great deal of time from the side of personnel and a lot of money by the patients and the consequential effects of infections and repeating their treatment, we decided to identify the frequency distribution of different kinds of vaginal infections and effective factors on their appearance, and simultaneously increase mothers' consciousness about the influential factors in causing them and prevent the excessive wastage of money and time. Therefore, this research was conducted with the aim of identifying the frequency distribution of common vaginal infections, the relationship between common vaginal infections with demographic and individual characteristics, the relationship between common vaginal infections and fertility factors, the relationship between common vaginal infections and individual hygiene among women referring to selected health centers in Isfahan City in 2007.

Methods

This research was of a descriptive-analytical type. The population of research in this study consisted of women who were suffering from vaginal infections referred to selected health centers in Isfahan City including Women Clinic at Amin Hospital, Amir Hamzeh Health Center, Shahid Motahari Health Center and Navab Health Center. The participants in this study were 266 women who were examined in this study by considering the inclusion criteria of the study; i.e., being married, suffering from vaginal infections, and Iranian nationality.

The sampling method in this research was easy random sampling. Data collection was carried out by interviewing the women and filling out researcher-made questionnaire with closed-ended questions (38 questions) and open-ended questions (25 questions). After coordinating with the nursing and midwifery department of Isfahan University of Medical Sciences and the authorities at selected health centers, the quali-

fied samples were interviewed. After diagnosing vaginal infections on the basis of diagnostic criteria (type of secretions regarding odor, color, amount, density, related symptoms like irritation, burning, etc), the questionnaires were filled out by questioners. The menopausal women, women who had divorced, women who had a special diet (vegetarian, etc) and women suffering from special diseases like AIDS, diabetics, lupus erythematic, and multiple sclerosis did not enter the study. The researchers embarked on sampling, interviewing and filling out the forms within 24 weeks (totally 672 hours) of referring to the selected centers throughout working weekdays from 8 to 12 in the morning.

In order to establish the scientific validity of the data collection means, the content validity method was employed. Accordingly, by using the published books and papers in the field of genital infections, the intended questionnaire was provided. Afterwards, the questionnaire was assessed by faculty members to establish its content quality and then, the final questionnaire was provided by doing any necessary changes. Also, in order to examine the scientific reliability of the questionnaire in this study, the test-retest was used. In this regard, the researchers completed the questionnaire with 10 patients out of the research population and refilled the same questionnaire after 7 to 10 days with same individuals. Then, the results of both tests were compared and by considering the results ($r= 0.7$), the reliability of the data collection means was established. It must be mentioned that the pilot cases were not estimated with the sample volume.

In this research, different kinds of common vaginal infections (gardnerella vaginitis, candidiasis vaginitis, trichomonal vaginitis, chlamydia infection) were considered as the dependent variables and the individual hygiene factors, midwifery factors and demographic features were considered as the independent variables.

The entering of the data was done via the SPSS software and the statistical analysis was done via descriptive statistics (mean, relative frequency) and analytical statistics (variance analysis, chi-square) by attending to the aims and quantitative and qualitative variables.

Results

In this study, the average age of 266 women referring to hygienic centers was 31.8 ± 7.09 years, with a minimum of 18 and a maximum of 51 years. The minimum marriage age of the women was 12 years and the maximum was 38 years with an average of 20.26 ± 4.43 . The average of marriage duration was 11.8 ± 7.99 years. 88.7 percent of women were housewives, 7.9 percent were employees and 3.4 percent were self-employed. 11.3 percent of women had bachelor education or higher, 50 percent diploma and associate diploma, 36.1 percent less than diploma and 2.3 percent were illiterate. 29.7 percent of the samples' husbands were employees, 57.1 percent were self-employed and 10.9 percent were workers and farmers and 2.3 percent were jobless. The research findings showed that 50.6 percent of the husbands had diploma or associate diploma, 41.7 percent lower than diploma, 6.4 percent bachelor degree or upper and 1.5 percent was illiterate. The minimum monthly income of the household among the samples of the study was 50 dollars and the maximum was 2000 dollars, with an average of 313.8496 dollars. The maximum weight of women was 110 kg and the minimum was 42 kg with an average of 62.3 ± 10.69 kg. Also, the minimum body mass index was 16.8 and the maximum was 47.15 with an average of 14.3 ± 4.49 .

According to the findings of the research, the highest frequency distribution was for gardnerella vaginitis (38.7 percent), the second rank for the candidiasis vaginitis (36.1 percent), while the trichomonal vaginitis (24.4

percent) was at the third rank. Finally, the chlamydia vaginitis allocated 0.8 percent to itself among vaginal infections in individuals participating in this research.

A significant relationship was found in this study between suffering from vaginitis and women's job ($P=0.001$). The research findings showed that the commonest vaginal infection among housewife women was vaginal-bacterial (39%) and the commonest vaginitis among employee women was candidiasis infections (47.6%) and the commonest among self-employed women was trichomonal infection (55.5%). The results of this research showed that there was a significant statistical relationship between suffering from vaginitis and the educational level of the spouse ($P=0.02$). 43.2 percent of individuals with lower-diploma degree or illiterate suffered from trichomonal infection. Nonetheless, by increasing the educational level of the husband to bachelor and higher, the prevalence rate of trichomonal infection was reduced to 11.8 percent.

According to the research findings in Table 1, there was a significant statistical relationship between suffering from different kinds of vaginitis and women's educational level ($p=0.006$).

The analysis of variance showed that there is a significant relationship between the BMI and suffering from common vaginal infections ($P=0.01$). In addition, a significant relationship was found between weight and suffering from common vaginitis ($P=0.02$). The maximum BMI was among the group suffering from candidiasis ($BMI=47.15$). Besides, the average of BMI in

Table 1. The relationship between common vaginal infections and the educational level of women referring to selected health centers in Isfahan City in 2007

Education	Vaginitis		Trichomonal		Gardnerella		Candidiasis		Chlamydia		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Illiterate	3	50	2	33.3	1	16.7	.	.	6	100		
Lower diploma	27	28.1	39	40.6	30	31.3	.	.	96	100		
Diploma and upper	33	24.6	49	36.6	50	37.3	4	1.5	134	100		
Bachelor and upper	2	6.7	13	43.3	15	50	.	.	30	100		
Total	65	24.4	103	38.7	96	36.1	2	0.8	266	100		

Table 2. The relationship between common vaginal infections with the treatment record of the spouse due to vaginal infections among women referring to selected health centers in Isfahan City in 2007

Spouse treatment record	Trichomonal		Gardnerella		Candidiasis		Chlamydia		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Had treatment record	22	31	24	33.8	23	32.4	2	2.8	71	100
Did not have treatment record	43	22.1	79	40.5	73	37.4	.	.	195	100
Total	65	24.4	103	38.7	96	36.1	2	0.8	266	100

the group suffering from candidiasis was higher than that in others (25.41).

No significant relationship was found in this study between the age average, marriage age average, marriage duration average, spouse' job, monthly income average of the family and the frequency of vaginitis.

The results of the study showed that no significant statistical relationship exists between the age average of the first period, the average of the gap between two periods, period regulation, the intensity of periodical pains and seeing stain between two periods with suffering from common vaginal infections. Also, no significant statistical relationship was found between the average age of the first pregnancy, type of the last labor and the record of infertility with suffering from common vaginal infections.

In this study, no statistically significant relationship was found between previous vaginal infection, number of intercourse in a week and the record of seeing stain after intercourse with suffering from common vaginal infections. Besides, no statistically significant relationship was found between methods of pregnancy prevention and suffering from common vaginal infections. The commonest pregnancy prevention method among women in this study was 32 percent IUD, 27.1 percent condom, 13.2 percent interruptive method, and 12 percent blended pills. 3.4 percent of women had been tubectomized and 1.1 percent spoke of their husbands' vasectomy. In addition, 6.8 percent of women in this study

did not use any pregnancy prevention method. In the present study, 50 percent of consumers of pregnancy prevention pills were suffering from candidiasis infection. Meanwhile, the percentage of the individuals suffering from trichomonal and bacterial vaginitis was equally lower among the consumers of the oral pills (25% trichomonal, vaginitis and 25% bacterial vaginitis). 55.6 percent of the individuals who had been tubectomized were suffering from gardnerella vaginitis and 44.7 percent of the individuals who were using IUD, were suffering from bacterial vaginitis. And, 28.2 percent of the IUD suffered from candidiasis infection. 44.4 percent of the individuals who used condoms were also suffering from candidiasis infection.

According to the findings of the study which are shown in Table 2, there was a significant statistical relationship between the treatment record of the spouse and the common vaginal infections ($p = 0.04$)

26.7 percent of the research samples mentioned the treatment record of the spouse due to vaginal infections, while 73.3 percent of them did not have any treatment records.

The results of the study showed that there is no statistically significant relationship between the times of changing the underwear and its fabric with suffering from common vaginal infections. In addition, no statistically significant relationship was found between the bathing situation (bathing before intercourse, bathing after intercourse, bathing during period, and

drying the private parts after going to washroom) and suffering from different kinds of vaginitis.

Discussion

The highest frequency in this study belonged to gardnerella vaginitis (38.7%), candidiasis vaginitis (36.1%) being at the second rank and trichomonal vaginitis (24.4%) in the third rank; finally, the chlamydia vaginitis allocated a rate of 0.8 percent of vaginal infections among the research participants to itself. In "infectious diseases of the female genital tract" book, it has examined 1181 cases of the patients who had vaginitis symptoms or were intensely prone to infection. According to their study results, the commonest type of vaginitis was the bacterial vaginitis which they called non-particular vaginitis. Trichomonal and candidiasis were considered as one fourth of the factors.⁹ In addition to the three previous infections, the chlamydia infection is considered as a vulvovaginitis. Chlamydia and trichomonal are common sexually transmittable organisms in the US.¹⁰ In other studies, the bacterial vaginitis allocated a 40 to 50 percent, the fungus infection a 20 to 25 percent and trichomonal vaginitis a 15 to 20 percent of vaginitis to themselves¹⁶ which indicate that the results of the study are congruent with the pointed-out researches.

In this study, no significant relationship was found between age and suffering from common vaginal infections. The study by El Qouqa et al also showed that there is no significant relationship between the age-range of 18 to 45 and the positive culturing of chlamydia.¹⁷ Agha Mirian et al did not find any significant relationship between age and the result of culturing the vaginal secretions with regard to candidiasis in Qazvin in 2006.⁶ In contrast, Riggs et al stated in their study in 2007 that hormonal disturbances which are common among adolescents can make them prone to bacterial vaginitis.¹⁸ Besides, Klebanoff et al concluded in their study in 2005 that women under the age of 20 suffer less from bacterial vaginitis.¹⁹

In the present study, no significant relationship was found between the marriage age and

suffering from vaginitis. Namkinga et al reported in their study in Tanzania in 2005 that there is no significant relationship between the age of first intercourse and suffering from candidiasis vaginitis.¹⁴

The findings of the study showed that there is a statistically significant relationship between the samples' jobs and suffering from common vaginal infections. However, Namkinga et al reported a negative relationship between job and the risk of suffering from candidiasis vulvovaginitis in their study which was conducted in Tanzania, Daro Salam in 2005.¹⁴

In addition, the research findings showed that there is a statistically significant relationship between the educational level of women and suffering from vaginal infections. Holzman et al reported in 2001 that the prevalence of bacterial vaginitis among women with 13 or more years of education is lower.¹¹ According to a study done by El Qouqa et al in 2009, women who had primary school education showed the highest rate of suffering from chlamydia.¹⁷ Mostafavi announced in his data analysis of population and hygiene in 2006 that it seems that individuals who have a low education suffer more from diseases due to less observance of hygienic principles. Education can promote mothers' capability in using health services (physician, clinic and hospital). The educated mothers have a better access to data about hygienic services and are more willing to use these facilities to prevent or treat their ailments.²⁰

The findings of the study show that there is a statistically significant relationship between men's educational level and suffering from vaginal infections. It seems that men who have a higher education, have better more well-paid jobs compared with less literate individuals. Consequently, they enjoy more social welfare it removes the economical poverty factor in suffering from diseases. Also, these individuals possibly have a better trainability for observing hygienic principles in contrast to men with lower educational levels who observe the hygienic principles less and have a lower awareness about the necessity for treating the sexual partner.

According to the findings of the study, no statistically significant relationship was found between the household's monthly income average level and the frequency of different kinds of vaginitis on the basis of statistical separation. Nonetheless, the minimum monthly income average was 316.100 dollars in the group suffering from bacterial vaginitis. Paul et al reported in their study in the US in 2008 that among the white American women, the low-income ones approximately suffered 2 times more from bacterial vaginitis. Also, among the African-American women, having a low income had a strong relationship with suffering from bacterial vaginitis.¹⁵ Riggs et al reported in 2007 that the psychological stresses are relevant to a higher prevalence of bacterial vaginitis and the appearance of all other risk factors. Individuals who face with chronic stresses often experience a change in their immune system and it seems that this issue justifies the increase of bacterial vaginitis risk among black women. Therefore, poverty and stress may overshadow the effects of hormones on the rate of infections.¹⁸

In addition, the findings of the study showed that there is a statistically significant relationship between the body mass index and suffering from common vaginal infections and also between weight and suffering from common vaginitis. One of the preparing factors of the abnormal growth of candidiasis in the vagina is obesity (increase in the body mass index).¹⁰

With regard to the stipulated fertility factors in this study, the findings of the study showed that there is no statistically significant relationship between the duration of periodical bleeding and the frequency of vaginitis. Although it seems that with an increase in the duration of periodical bleeding and the alkalinity of the vagina in this period, the probability of suffering from vaginal infections increases. Also, no statistically significant relationship was found between the period regulation and the frequency of vaginal infections. El Qouqa et al reported in their study in 2009 that there is no significant relationship between suffering from candidiasis infection and irregular periods.¹⁷

The chlamydia infection is bereft of any symptoms in 80 percent of the cases. But, in some patients it might cause symptoms like seeing stains between two periods. Also, one of the common signs of trichomonal infection is seeing stains between two periods. Nonetheless, no statistically significant relationship was found between seeing stains and suffering from vaginitis in this study.

According to the research findings, there is a statistically significant relationship between suffering from vaginitis and the treatment record of the spouse due to vaginal infections. Treating the spouse is only feasible in case of the sexual transmittance of infection. Chlamydia has been known as the most common sexually transmittable infection in the US. So, simultaneous treating of the sexual partner is recommended. In case of trichomonal infection, treating the sex partner can also prevent its return.⁷ Moreover, in case of having frequent returns of the candidiasis infection, gaining repeated infection from the spouse is one of the purported theories.¹

Although the results of the study did not show a statistically significant relationship between common vaginal infections and the record of previous vaginal infection, it seems that the non-observance of individual hygienic principles, not completing the treatment course, inadequate training with regard to the way of using the medications, the absence of precise diagnosis and the presence of an improper treatment, the sexual partner's avoidance in taking the medications, repeated colonization from the digestive system (trichomonal vaginitis, different kinds of candidiasis), the contribution of all kinds of disease factors or resistance to medicines all increase the repeated appearance of vaginal infections among women.

Zhang et al reported through a study which had been done in one of the rural poverty-stricken areas of China in 2005, that having a previous record of trichomonal vaginitis increases the probability of its occurrence in future.²¹

According to the research findings, no statistically significant relationship was found between the times of intercourse and suffering

form vaginal infections. Chiaffarino et al reported in their study in 2004 that there is no significant relationship between sexual propensity and suffering from bacterial vaginitis.²² In "infectious diseases of the female genital tract" book, it has been reported that having more than 4 times of intercourse in a month is a risk factor for the candidiasis culture to be positive. Also, they reported in their case-witness study that a frequent intercourse (7 times or more in a week) is the strongest risk factor for suffering from candidiasis infection.⁹ Bacterial vaginitis is mainly observed among sexually active women. But it does not seem that it has a close relationship with sexual activity.¹ It has not been clarified what initiates the disturbance in the natural fluoride of vagina. It is believed that the frequent alkalinity of the vagina as a result of frequent intercourses contributes to this problem.⁵

According to the findings of the study, no statistically significant relationship was found between different methods of pregnancy prevention and suffering from common vaginal infections. The commonest pregnancy prevention method among the women in this study was 32 percent; IUD followed by condom; 27.1 percent, the interruptive method; 13.2 percent, and blended pills; 12 percent.^{3,4} 3.4 percent of women had been tubectomized and 1.1 percent of them stated their husbands' vasectomies. In addition, 6.8 percent of the women did not use any pregnancy prevention method.

The hormonal pregnancy prevention pills make the individual more prone to candidiasis vaginitis due to increasing the acidity of vagina and the cellular glycogen.⁹ In the present study, 50 percent of pregnancy prevention pills consumers suffered from candidiasis infection. Sweet and Gibbs found out that the likelihood for the presence of fungus in the vaginal secretions culture of women who used the oral pregnancy prevention pills is higher. Other studies also have reported an increase in suffering from fungal infection among the consumers of these pills. All recent studies admit that consuming a low dosage of these pills does not cause an increase in the amount of candidiasis in the culture.⁹ According to the results of the present

research, the percentage of those suffering from trichomonal and bacterial vaginitis was equally low among the consumers of oral pills (25 percent; trichomonal vaginitis and 25 percent bacterial vaginitis). Holzman et al reported in their study in 2001 that the women who had been using hormonal methods for pregnancy prevention showed a 50 percent decrease in suffering from bacterial vaginitis.¹¹ Also, Riggs et al reported in their study in 2007 that using hormonal methods (oral, injective and implant pills) is associated with a sharp decrease in bacterial vaginitis. Consuming the hormonal methods was relevant to a lower prevalence of bacterial vaginitis and their higher recuperation, but it did not have any relationship with the occurrence of bacterial vaginitis. In addition, the oral, hormonal methods are protective against trichomonal infection. Other studies state that consuming hormonal methods for any purpose during the one year follow-up period was relevant to reducing the returning risk of bacterial vaginitis and paves the way for this hypothesis that the hormonal factors can be effective in this regard. While consuming the injective-hormonal methods increase the risk of sexually transmitted infections (chlamydia, gonorrhea) three times more than those who do not use the hormonal methods,¹⁸ using these pills increases the likelihood of chlamydia infection.⁹ According to the results of the present research, 55.6 percent of individuals who had been tubectomized, were suffering from gardnerella vaginitis. Rigs also indicated that the occurrence of bacterial vaginitis among women who had been tubectomized was way higher and a lower probability of improvement exists for them.¹⁸ According to the results of the present study, 44.7 percent of individuals using IUD were suffering from bacterial vaginitis and 28.2 percent of IUD users were suffering from candidiasis infection. IUD induces the risk of bacterial vaginitis by increasing the number of anaerobic bacteria. It also leads to an increase in the occurrence of PID.³ An article reviewed the association between IUD and susceptibility of suffering from chlamydia infection and indicated that IUD users significantly had more fungal cells in

their vagina than those who did not use IUD (20 percent vs. 6 percent). Besides, this study in 2008 reported that IUD users had more candidiasis infection compared with those who did not use IUD (14 percent vs. 8 percent).²³ According to the results of this study, 44.4 percent of individuals who used condom were suffering from candidiasis infection. In "infectious diseases of the female genital tract" book, it has been reported that one of the risk factors for the candidiasis culture to be positive has been the use of condom.⁹ Meanwhile, Holzman et al reported in 2001 that bacterial vaginitis is less common among women who use condom while having intercourse.¹¹ Besides, the likelihood of suffering from chlamydia vaginitis among women who do not use pregnancy preventive methods increased 4 times.⁹ It seems that the numerous effects of hormonal methods on acquiring and returning of vaginal infections might be due to different characteristics of the population which has caused some population groups to be more prone to risk.

In spite of the fact that observing the individual hygienic principles has a significant effect in preventing infections, especially the vaginal infections, the findings of our research did not indicate a significant relationship between suffering from different types of vaginitis and individual hygienic factors (times of changing the underwear, the fabric of the underwear, bathing before intercourse, bathing after intercourse, bathing during periods, drying the private parts after going to washroom). In "infectious diseases of the female genital tract" book, it has been stated that despite several reports, no significant relationship was found between preparing factors like cleansing and drying the private parts from back to front, the fabric of the underwear, diet and stress or suffering from vulvovaginal candidiasis among the samples. Studies show that wearing thick underwear increases the risk of suffering from fungal infection due to keeping the vagina area warm and damp. Also, wearing underwear which has been made by synthetic cloths can intensify the vulvovaginal symptoms.⁹ Zhang et al stated in their study in 2005 that lack of awareness about

the hygiene of the reproductive area, bathing with polluted water and cleansing the reproductive area with polluted water before sexual intercourse increases the amount of trichomonal infection.²¹ In addition, Klebanoff et al reported in their study in 2005 that the positive culture of bacterial vaginitis among the American black women increases by a reduction in the hygienic condition.¹⁹ Holzman et al reported in their 2001 study the prevalence of bacterial vaginitis among women who regularly take a bath (4 times or more in a week) as 28 percent and among the women who take bath less as 53 percent. But among the women who took bath 4 times or more in a week, it was mentioned as 50 percent compared with 27 percent of the women who took a bath less frequently.¹¹

Conclusion

With regard to the results of the study, knowing the factors related to the vaginal infections can be effective in preventing and reducing the suffering from them. By attending to this fact that a significant relationship was found between women's educational level and suffering from common vaginal infections and the significance of observing the hygienic principles in preventing the occurrence of infectious diseases, it seems that applied trainings in proportion with women's educational level can be greatly conducive. Consulting with women about familiarity with the preparing factors of vaginal infections and the preventive ways of suffering from them alongside observing the individual hygiene and the principles of sexual hygiene from the side of women and operational trainings in this regard must be considered more than before. In addition, raising the attention of men about following the sexual and individual hygienic principles and also accepting the treatment from their side in the sexual transmission of the infection is of paramount significance. All in all, promoting the hygienic behaviors, especially the sexual hygiene of the individuals in society and employing efficient personnel for proper diagnosing and treating of vaginal infections can have a major role in their prevention and treatment. Consequently, conducting stu-

dies about assessing the effect of individuals' lifestyle in suffering from these infections and the effect of men's participation in preventing and faster improving of these diseases can complement the results of this study. Since the launching of midwifery consulting clinics has recently ratified by the concerned ministry and the consequent development of midwives' consulting performance in these clinics, it seems that proper opportunity would be

gained in order to prevent the prevalence of these infections.

With regard to this point that no statistically significant relationship has been gained between some of the examined factors and different kinds of vaginal infections, it seems that the number of samples and the research setting have been effective in this research.

The authors declare no conflict of interest in this study.

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