Effect of integrated health promotion intervention and follow up on health issues (clothing way, food habits, urinary habits, sexual behavior habits) related to urinary tract infection among pregnant women. A randomized, clinical trial

S. YAZDI[1], K. ALIDOUSTI[1], B. TIRGARI[2], Y. JAHANI[3]

[1] Midwifery Department, School of Nursing and Midwifery, Kerman University of Medical Sciences, Kerman, Iran;
[2] Nursing Research Center, Medical Surgical Department, School of Nursing and Midwifery, Kerman University of Medical Sciences, Kerman, Iran; [3] Institute for Futures Studies in Health, Kerman University of Medical Sciences, Kerman, Iran

Summary

Introduction. *Urinary tract infection, as an important element is associated with the risk of many problems in pregnancy and support consulting is effective factor in reducing the problem. Aim of this study is to evaluate the impacts of integrated intervention on life style (clothing way, food habits, urinary habits, sexual behavior habits) Related to Urinary Tract Infection Among Pregnant women.*

Method. *This interventional used pretest- posttest design with the control group study was performed on 130 healthy pregnant women. The samples were divided randomly into two groups of 65 people. The first group received two sessions of 45 to 60 minutes Psychoeducational counseling, four telephone follow-up support and training pamphlets and the control group received routine education. The relevant questionnaires were completed by both groups before the intervention and a month later. The data were analyzed with Spss V.22 software.*

Results. *Comparing within the groups it was shown that the variables were increased in the experimental group after consulting compared to the conditions before consulting (P < 0.001), however, no increasing was found in the average variables before consulting and after it. Moreover, comparing the variables in two experimental and control groups significant statistical difference was found in different studied areas after consulting (P < 0.0001).*

Conclusions. *Psychological counseling and phone follow-up are effective in improving the knowledge, attitude, and performance of pregnant women in preventing the urinary infection Therefor it is recommended these trends to be considered as training programs in order to increase capacity and primary prevention of pregnant women.*

Introduction

Urinary tract infection is a common clinical problem, including urinary tract infections, bladder and kidney infections that asymptomatic bacteriuria is among other common cases [1, 2]. The prevalence of urinary tract infection in women is considered as an important element of public health [3]. Prevalence of urinary tract infections in pregnant women is 1-3% which is 5-10% in pregnancy and 20-40% leads to symptomatic infection if untreated, moreover, 25% of women are affected by urinary tract infection annually and each year 7 million people refer to physicians to evaluate the infection or its symptoms. More than 40-50% of women experience the symptomatic urinary tract infection at least once during their life, and its prevalence is 4 times in girls than boys [4].

According to the global estimations, 150 million people suffer from urinary tract infection annually [5, 6]. The prevalence of urinary tract infections in developing countries is 20% [7]. The prevalence is 12.4% in Iran and it is different in different cities [8-10]. Asymptomatic bacteriuria is a continuous and active proliferation of bacteria in the urinary tract without causing symptoms which is significantly important since it has no clinical symptoms. Particularly in pregnant women, physiological and anatomical changes in the urinary tract, as well as immune system changes during pregnancy increase the prevalence of asymptomatic bacteriuria and in some cases, it leads to symptomatic urinary tract infection resulting in serious danger to the mother and fetus [1, 2]. In addition to these changes, some parameters such as age, sex, socioeconomic status, parity, pregnancy, sickle cell anemia, manipulation of the urinary tract, pregnancy age, and frequency of sexual intercourse in the week are effective in increasing the prevalence of asymptomatic bacteriuria [11]. The disease can cause high blood pressure, pre-eclampsia, anemia, amnionitis, maternal mortality, preterm delivery, stillbirth, sepsis, and B streptococcal infection and low birth weight that

the mortality rate of these infants is 11% higher than that of babies with normal weights [8, 12-15].

Children born from mothers infected with pyelonephritis are affected by impaired psychomotor development. Studies show that in children who are born preterm with low birth weight, IQ scores are lower and nervous disorders are higher [14] Some studies have shown that antimicrobial therapy of urinary tract infection does not reduce maternal and fetal complications rather it imposes a heavy cost on society [16-18]. It is estimated that the annual cost of 7 million infections in young women is over a billion dollars in the United States [4].

Urinary tract infection screening at the beginning of pregnancy is considered as the standard care actions in prenatal care that is possible through counseling and testing [19]. In consultation with pregnant women special attention should have been paid to their age as an important factor in increasing incidence of kidney infection and by increasing each age decade 1% is added to the rate of bacteriuria [20].

According to the studies, the effective practices in preventing the urinary tract infection include clothing way, food habits, urinary habits, cleaning way and habits related to sexual behavior [21]. Hence, applying empowerment programs aimed to increase the knowledge and self-efficacy is essential for the health and life quality improvement [7]. The researchers believe that education is an essential component of all preventive behaviors [22]. Awareness and observance of hygienic behavior in any society are inevitable, therefore, individuals and communities need training the proper health behaviors to understand and to practice the appropriate points in life, to maintain the health and to avoid the diseases [15]. Healthcare and pregnancy educational counseling are resources for various issues. One of the most appropriate midwifery interventions to increase the women's awareness is counseling since its assistance the client to decide consciously and voluntarily taking into account all aspects. In other words, counseling is to study the problems deeply, that the person is encountered [23]. Considering the prevalence of urinary tract infection in pregnancy and its negative impact on the mother and fetus, educational counseling can contribute to increasing the women's awareness. Hence, this study aimed to evaluate the impacts of educational intervention on life style (clothing way, food habits, urinary habits, sexual behavior habits) related to urinary tract infections. It is hoped that the results would be an effective step to reduce the rate of urinary tract infection and thereby have a primary prevention step.

Methods

This Randomized Clinical Trial intervention used pretest-posttest design with the control group. The studied population were the first-trimester pregnant women who referred to health care centers in the southeast of Iran.

Inclusion criteria including: first trimester of pregnancy, lack of urinary tract infection experience, non-infected by diseases causing the urinary tract infection such as kidney disease, diabetes, immune deficiency, and exclusion criteria included acquiring information regarding urinary tract infections from other sources by the end of sampling in the field of urinary tract infection, infecting by urinary tract infection during the study.

The sample size was calculated as 130 people considering the confidence level of 95% and loss of 10% that were divided into two groups of 65 people.

$$\frac{\left(z_{1-\frac{\alpha}{2}} + z_{1-\beta}\right)^2 (\sigma_1^2 + \sigma_2^2)}{d^2} \qquad n = 60$$

In this study, classified random sampling method was used. First, the samples were selected from the list of pregnant women who referred for primary care. Then, based on a classified randomizing, 10 people were determined for each group (intervention and control) through sortation from a list of pregnant women in the first trimester of pregnancy from each health center. Each group received a pre-test and it was completed by patients. Then the intervention group received education program.

The participants were informed about the procedure and were reminded that participation is voluntary. The questionnaires were completed by the participants followed by obtaining written informed consent, and after reviewing the completed questionnaires, the eligible individuals were placed in groups based on the allocation sequence. The considered individuals were divided into two groups of 65 people based on classified randomizing.

INTERVENTION

The interventional group received 2 psychoeducational counseling sessions of 45 to 60 minutes with the interval of a week, regarding the anatomy of the urinary tract and reproductive health, nutrition and its effect on urinary tract infections, sex and its relationship with urinary tract infections and the complications of urinary tract infections during pregnancy. At the end of each session, free asking question was conducted, and at the end of the second consulting session, a pamphlet containing a summary of the expressed subjects were given to them. Then four supportive counseling sessions in frequent telephone follow-up were conducted for a month focusing on observing the trained issues. All the counselling carried out by one researcher who was expert in counselling due to her university major. Telephone follow-up was just for emphasis to review pamphlet and not any excessive information other than in-person counselling sessions. The relevant questionnaire was completed by both groups before the intervention and one month later. However, the control group received just the routine cares in health care centers.

The questionnaire was developed by the researcher. It was designed based on the use of various articles, books and experts' opinions. Then its validity and reliability

were measured. The questionnaires contain three sections.

Each questionnaire contains 64 questions consisting of three parts: part I: demographic questions, 11 questions; part II: questions regarding awareness of urinary tract infections with 8 questions; part III: attitude with 11 questions, 13 questions regarding the mental performance and 20 questions for actual performance. Scoring was based on the Likert scale.

Fourth Likert scale was used in scoring. The score was from 0 to 100, and the closer the score was to 100, a better state of attitude and performance's awareness will be shown.

Content validity was evaluated through both qualitative and quantitative methods with assisting 10 the midwifery and nursing professors.

In the qualitative study of the content, the professors were asked to provide their feedback after fulfilling the qualitative examination of the tool according to the observation of the grammatical criteria, use of the proper words, the placement of the items in their proper place and the appropriate rating. Based on those points, the corrections were made. In total, in the content validity stage, 3 questions were removed and some of the changes occurred in this section regarding the suggestion of the professors included the modifications in the structure and the wordings of the questions, the simplification of the questions, the subtraction and integration of similar questions.

Cronbach's alpha coefficient was used to determine the reliability of the questionnaire, which was performed on the people whose demographic characteristics were similar. According to the researchers, alpha values are less than 5. It is unacceptable that in this study, this value was 75%.

The data were analyzed by spss V.22 software. The significance level was 0.05.

The distribution of data in these two groups was not related to age, gestational age and the times of pregnancy. Therefore, Mann-Whitney test was used for comparison. Parametric t-test and paired one [t-test] were used to compare the other data because of their normal distribution.

Results

Both intervention and data collecting lasted for 4 months. There was no significant difference in terms of socio-demographic characteristics between the groups, and both groups were similar in terms of demographic characteristics (Tab. I).

Intra-group comparison of both intervention and control groups in terms of knowledge, attitude, performance, actual and mental health performance and actual and mental nutrition performance showed that the variables in the intervention group after consultation had a mean increase compared to the previous consultation (P < 0.001), however, in the control group the increase in the average variable was not shown (Tab. II). By comparing between two groups after consultation, significant statistical difference was seen in the different areas of the study (p < 0.0001) (Tab. III).

Discussion

Results of this present study showed that supportive and psychoeducational counseling plays quite important role in informing the people regarding urinary tract infection. Hence, by awareness of risk factors for urinary tract infections and changes in health behaviors, effective steps can be taken toward reducing the urinary tract infections, particularly in women [24]. According to Gheiasi (2017) Patient education could improve self-care behaviors in patients with heart failure [25]. The results of Moor et al. study (2008), showed not respecting some health tips regarding sexual behaviors is associated with urinary tract infection. Leydon et al (2010) also stated that the most important risk factor for recurrent urinary infection in women is the risk factor associated with health behaviors [26-28].

The readiness of community members to understand and to practice the right way of life to maintain health and to prevent the diseases require shaping behavior [29].

Understanding the seriousness of the complications and costs of urinary tract infection and its treatment plays an important role in promoting the individuals' attitude in this regard. According to researchers to adopt preventive behaviors the knowledge regarding a disease is not enough, rather the mindset and attitude play an important role in preventive action [30].

Emiru (2013), concluded that the women believe that urinary tract infection causes maternal and fetal complications in addition to the imposed costs, and they request for counseling programs for preventing UTI. Regarding the attitude of women toward the infection, Shih et al. (2006) stated in their study that theories of health education in the field of health promotion, knowledge and attitude of people toward the health risk factors, changes in behavior during various stages of planning, implementing and evaluating a program are effective for women with urinary tract infection [30, 31].

Mazor-Dray (2009), in his research, achieved an increased knowledge and practice of pregnant women after training consultation. Recommendations on the detailed plan for training consultation was the framework of this study. In this study, it is recommended to focus on the increased awareness and performance of the pregnant women regarding the urinary tract infection. Moreover, this study also showed the ability of pregnant women in their care [8, 31, 32].

Health mental function associated with urinary tract infection of women in this study, showed significant statistical difference in the intervention group compared the control group, that it is consistent with the study of Jalali et al. (2014), they found that training based on the planned behavior, result in improved performance in

Tab. I. Comparison of demographic variables in the intervention and control groups.

Variable		Control	Intervention	Statistical test results
Age		27/07 ± 5/17	26/8 ± 5/28	Mann-Whitney p = 0.62
Pregnancy age		10.09 ± 2.2	10.44 ± 2.37	Mann-Whitney p = 0.29
Parity		1.68 ± 0.91	2.35 ± 1.38	Mann-Whitney p = 0.07
Education of wife	High school	17 (26.2)	25 (38.5)	X^2 = 2.25 P = 0.32
	Diploma	36 (55.4)	30 (46.2)	
	Academic	12 (18.5)	10 (15.4)	
Education of husband	High school	31 (47.7)	20 (30.8)	X^2 = 3.39 P = 0.11
	Diploma	28 (31.1)	38 (58.5)	
	Academic	6 (9.3)	7 (10.8)	
Occupation of wife	Housewife	59 (90.8)	53 (81.5)	Chi^2 = 2.25 P = 0.12
	Employee	6 (9.3)	12 (18.5)	
Occupation of husband	Employee	6(9.2)	6 (9.2)	X^2 = 0.17 P = 0.98
	Working	20 (30.86)	22 (33.8)	
	Free	27 (41.5)	25 (38.5)	
	Etc.	12 (18.5)	12 (18.5)	

Tab. II. Comparison the difference between the variables of awareness, attitude, mental and actual health performance, mental and actual nutrition performance before and after the consultation in intervention and control groups (in group).

Group	Time	Variables	Awareness	Attitude	Mental health performance	Actual health performance	Mental nutrition performance	Actual nutrition performance
Intervention	Before	Mean	48.6	52.2	60.7	62.83	57.9	49.23
		SD	12.2	16.6	12.63	10	20.92	14.61
	After	Mean	78.9	80.2	80.15	81.53	85.12	77.23
		SD	8.4	10.3	10.67	9.62	14.6	12.68
	Statistical test results		t = 23.7 P < 0/001	Z = -6.9 P < 0.0001	Z = -6.9 P < 0.0001	Z = -6.7 P < 0.0001	Z = -6.7 P < 0.00001	t = -12.6 P < 0.0001
	Before	Mean	41.7	45.8	41.48	48.37	48.37	49.8
		SD	12.3	12.48	19.12	24.32	24.32	14.8
	After	Mean	42.1	47.9	49.28	51.96	51.9	50.25
		SD	13.5	13.56	13.1	25.91	25.91	15.32
	Statistical test results		Z = -1.3 P = 0.1	Zv-3.2 P = 0.1	Z = -3.2 P = 0.1	Z = -1.34 P = 0.17	Z = -1.34 P = 0.17	Z = -1.06 P = 0.28

Tab. III. Comparison the difference between the scores of awareness, attitude, mental and actual health performance, mental and actual nutrition performance variables after the consultation in intervention and control groups (out-group).

Variable	Mean ± standard deviation		Z	P-value
	Intervention group	Control group		
Awareness	30.36 ± 10.27	0.38 ± 1.36	-10.25	< 0/0001
Attitude	28.18 ± 15.6	2.09 ± 5.14	-9.25	< 0/0001
Mental health performance	19.43 ± 14.36	0.87 ± 3.64	-7.53	< 0/0001
Mental nutrition performance	27.17 ± 20.1	3.5 ± 12.5	-7.8	< 0/0001
Actual health performance	18.7 ± 10.3	0.5 ± 3.03	-9.2	< 0/0001
Actual nutrition performance	28 ± 18.7	0.4 ± 3	-8.3	< 0/0001

preventing the urinary tract infections, it is likely that training-supportive consultation could have resulted in improved performance in increasing the awareness and the impact on people's attitude [4].

In general, a person's behavior and performance occur followed by the intention or function in the mind and without the intention, no behavior will happen. In present study, significant differences were found in mean maternal mental function compared to healthy habits associated with urinary tract infection before and after the intervention that this finding likely reflects the impact of the designed counseling program. Korb, in his study, in 2018 concluded that intervention on pregnant women regarding the urinary tract infection increases their knowledge, attitude, and self-care of that is consistent with the result of this present study

in regard with awareness, attitude and performance. Hashemi Parast in his study, in 2013 concluded that causes of Urinary Tract Infections are a low level of knowledge, attitudes, self-efficacy, and performance in this regard, which refers to the need for interventional programs that confirm the results of this present study in all three areas [33, 34]. The limitations of the study were telephone interviews and due to time and space constraints, it was not possible to have classes for the spouse or other influencer on pregnant women behavior.

Conclusions

The results of present study showed the improvement in knowledge, attitude and mental and real performance of the pregnant women followed by psychoeducational counselling and telephone follow-up. It is being suggested that holding training classes on the preventive behaviors of the urinary tract infection in the premarital counseling classes, health centers, universities, clinics and even schools will be effective as well; counseling should be used in order to change the attitudes and the behavior of women to the prevention of the urinary tract infections during pregnancy.

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Conflict of interest statement

The authors declare no conflict of interest.

Authors' contributions

SY and KA designed the work and drafted the manuscript. SY and KA had prepared counselling package. BT and SY had full access to all of the data and take responsibility for the integrity of the data. YJ take responsibility for accuracy of the data analysis. All authors read and approved the final manuscript.

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Correspondence: Katayoun Alidousti, Kerman-Haft Bagh Alavi-Pardizeh oloompezeshki, School of Nursing and Midwifery, Midwifery Department, Kerman, Iran - Tel.: 09132421749 03431325219 - Fax: 03431325218 - E-mail: alidoosti@kmu.ac.ir - kalidousti@gmail.com