ORIGINAL ARTICLE

The Effect of Peer-Education on UTI-Related Preventive Behavior According to HBM among First-Grade High School Female Students in Shiraz, 2014

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Received: 3 November 2014
Revised: 16 November 2014
Accepted: 5 December 2014

Abstract

Background: Urinary tract infection (UTI) is one of the most common infections seen in all age and both sex groups which frequently occur among adolescent and young women. UTIs are the second most common cause of emergency department attendance for adolescents. Considering the importance of promoting preventive behaviors of UTI, we aimed to evaluate the effect of peer education based on health belief model (HBM) on preventive behaviors of UTI among first-grade high school female students.

Methods: In this quasi-experimental study, we recruited 168 first-grade high school girl students who were assigned into intervention (n=84) and control (n=84) groups. Data were collected using an HBM questionnaire which was designed by the researcher based on the review of the literature; before, immediately after and one month after the intervention. A total of 12 students in the intervention groups were selected as peer educator and attended two 2-hour training sessions for one week and were trained by the researcher. Afterwards, the trained peers taught the learned materials to their peers in two 1-hour sessions for two weeks through conferences and question-and-answer sessions. Data were analyzed by SPSS18 using t test and RMANOVA. The significance level was set at <0.05.

Results: The results showed that the mean scores of knowledge, HBM constructs and preventive behaviors related to UTI significantly increased in the participants of intervention group immediately after and one month after the intervention.(P<0.001)

Conclusion: Peer education based on HBM seem to promote preventive behaviors related to UTI and reduce the risk of the disease among students.

Trial Registration Number: IRCT201404167531N5

Please cite this article as: Jahanbin I, Heydari N, Ghodsbin F, Sayadi M. The Effect of Peer-Education on UTI-Related Preventive Behavior According to HBM among First-Grade High School Female Students in Shiraz, 2014. J Health Sci Surveillance Sys. 2015;3(1):20-26.

Keywords: Adolescent; Female; Student; Behavior; Urinary Tract Infection

Introduction

Urinary tract infection (UTI) is one of the most common infections seen in all age and both sex groups. UTI is treatable and, to some extent, preventable; however, if left untreated, it can cause serious complications such as bacteremia and pyelonephritis.[1] The incidence of the disease is high . It has high mortality and morbidity rates

as well.[2] Generally, women are 10 to 30 times more likely to develop UTI than men.[3] Approximately, 40 to 50% of women experience at least one episode of UTI during their lifetimes.[4] Moreover, the incidence of the disease significantly increases (up to 20%) in young girls during adolescence.[5]

Acute uncomplicated UTIs frequently occur among adolescent and young girls. After traumatic injuries, UTIs are the most common cause of emergency department attendance for adolescents.[6] Besides, women are at higher risk (≥50%) of disease recurrence. However, the recurrence rate can reach as high as 80 to 90% during lifetime.[7] Annually, 150 million people are diagnosed with UTIs worldwide, Which costing 6 million dollars for health care expenditures.[5, 8, 9] On the other hand, the prevalence of UTIs among women is considered as an important indicator of community health.[10] Hence, the high prevalence of infection, high incidence, morbidity and mortality rates, the risk of disease recurrence, complications caused by the disease and healthcare costs call for special considerations to such health issue.[1, 8, 11]

Research suggests that individuals' adherence to healthy behaviors can affect their susceptibility to the disease.[1, 3, 12-15] UTIs can be prevented by appropriate healthy behaviors.[3, 8] People in all communities also need to acquire proper healthy behaviors in order to learn and practice healthy lifestyles, maintain health and prevent disease.[10] Accordingly, health education provides them an opportunity to modify healthy behaviors.[16] To achieve educational goals, it is important to select an appropriate model. Currently, applying theories has almost become a compulsion in health education as it helps to obtain a better understanding of the factors influencing healthy behaviors. It also helps educators to initiate and guide education in a correct direction.[17]

Health belief model (HBM), which was first developed by social psychologists in the 1950s, has been extensively used by health professionals.[18] This model was proposed as a framework for exploring why some people who are not ill take actions to avoid illness whereas others fail to take preventive actions.[19] HBM is considered as an important behavioral pattern and plays an important role in preventing diseases.[20] It attempts to explain individuals' health-related behaviors and the actions taken to prevent diseases and injuries. Perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy and cues to action are the six constructs of HBM.[18] Likewise, peer education has been widely used in health promotion practice.[21]

Several studies have reported the effectiveness of peer education in healthy behavior promotion.[22] Such method has found to be advantageous in several ways. Not only the trained peers can transfer the obtained information through communication with their peers, but they can also be a good behavioral model for them. The educated peers can serve as a liaison between schools and health care centers as well.[23] Peer education is considered as an appropriate health behavior change model.[24]

Many of the studies about children and adolescents UTI in Iran are exclusively descriptive research related to diagnostic and therapeutic methods. As yet it isn't done any planned intervention related to preventive methods in children and adolescent.[8] Considering the fact that female adolescents constitute a significant part of Iranian population, paying attention to their health is essential for the future of our country. Since health behaviors which are established during adolescence have persistent effect, teaching adolescents proper healthy behaviors to promote health-enhancing knowledge and skills seems necessary. Therefore, we aimed to evaluate the effect of peer education based on HBM on preventive behaviors related to UTIs among first-grade high school girl students in Shiraz in 2014.

Materials and Methods

This study was approved by the Ethics Committee of Shiraz University of Medical Sciences (Ethics Committee Approval Number: CT-92-6926). In this quasi-experimental study, we recruited 168 first-grade high school girl students from Shiraz city in 2014.

The sample size was calculated as 84 in each group based on the data of similar studies[1, 8] using PASS statistical software (power: 80%; α: 0.05; effect size: 40% and loss rate=20%).

The participants were selected using cluster random sampling method with matching based on geographical living area, so that the researcher initially selected 2 out of 4educational districts, then selected 2 high schools from each district randomly and assigned them into intervention and control groups (Figure 1). The control and intervention schools were selected in a manner to be located in similar geographical and socio-economic areas; whereas, there was no possibility of exchanging information between the groups. Finally, 42 students were selected from each school using simple purposive sampling method.

Inclusion criteria were willingness to participate in the study and educational sessions and studying in the first-grade of high school. However, exclusion criteria were history of participation in any educational program on UTIs, absence of more than one session in the training program and unwillingness to participate in the study.

Data were collected using HBM questionnaire which was designed by the researcher based on the literature review. Face and content validity of the

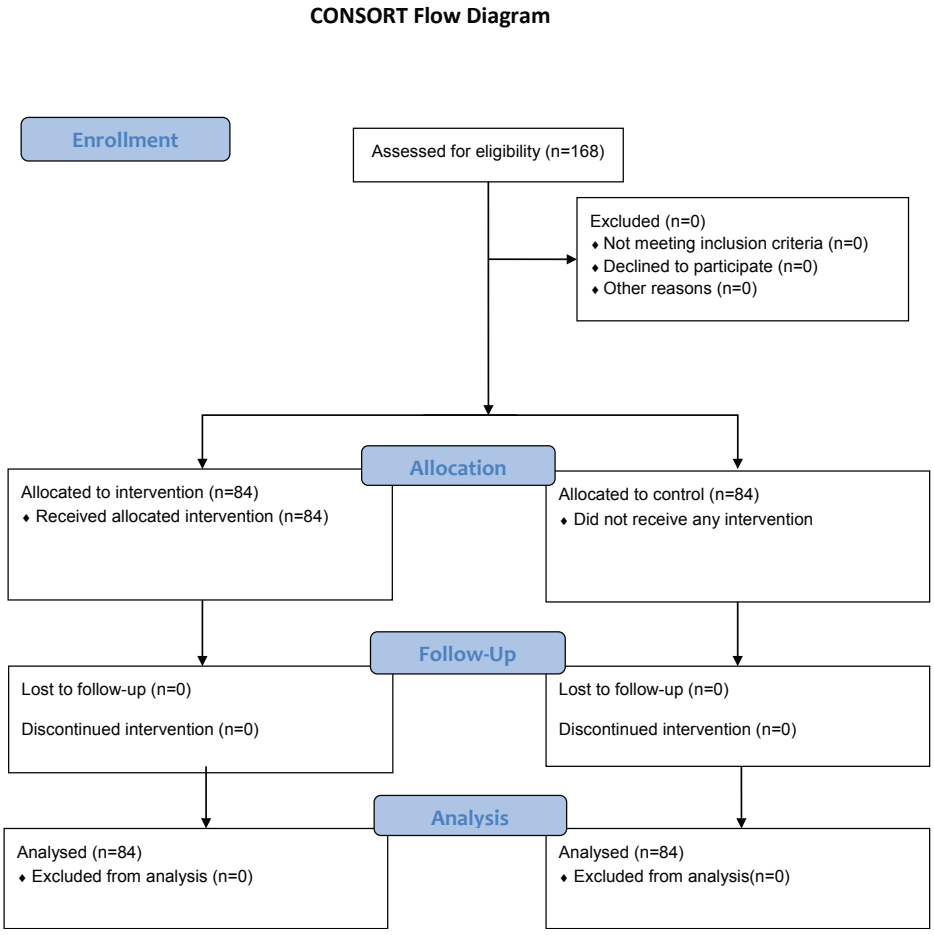

Figure 1: Flow diagram of the participants during the study is shown.

questionnaire was confirmed by 5 experts. Reliability was determined by Cronbach's alpha after the filling out the questionnaires by 45 students, at the same educational level, who were not enrolled in the study. Cronbach's alpha coefficients were calculated as 0.79, 0.81 and 0.73 for knowledge, attitude based on HBM and behavior sections respectively.

The HBM questionnaire is consisted of 4 sections. Part I comprises 6 items inquiring about demographic characteristics of the respondents including age, parents' job, parents' educational level and history of UTI. Part II consists of 15 items assessing the respondents' knowledge about UTI. The items are scored as either correct (1) or incorrect (0) and the total knowledge score in this section ranges from 0 to 15.

Part III consists of 31items assessing the respondents' health beliefs/perceptions based on HBM constructs. The items are presented on a 5 point Likert scale anchored at 1=completely disagree and 5=completely agree except for 7 items which are reversely scored. In this section, respondents are asked about their perceived susceptibility (5 items), perceived severity (5 items), perceived benefits (5 items) and perceived barriers (5 items); total scores for this subscale ranged from 5 to 25.The subscales of self-efficacy (6 items) and cues to actions (6 items) contains 12 items and the possible scores range from 6 to 36 for this subscales. Finally, 18 items were summed to assess preventive behaviors of UTI on a 5-point Likert scale; total scores for this subscale ranged from 18 to 90.

After obtaining ethical approval, the participants were selected and assigned into intervention and control groups. The aims and methods of the study were explained to the students in an orientation session which was held for each group separately. After obtaining written informed consent from all participants, they were asked to complete the questionnaires.

From every 14 participants in the intervention groups, 2 volunteer participants (total 12 participants out of 84) were selected as peer educator based on the following criteria; obtaining higher pre-test scores than their peers, having sense of responsibility according to the declaration of their school's officials, having good expression and communication ability. The recruited peer educators attended two 2-hour training sessions for one week and were trained by the researcher. The researcher applied educational methods such as lectures, question-and-answer sessions and distribution of educational booklets summarizing information about UTI and its preventive

methods based on HBM.

After adequate preparation, the trained peers taught the learned materials to their peers in two 1-hour sessions for two weeks through conferences and questions and answers. The same booklets were also distributed to the students. The questionnaires were completed again once immediately after and once one month after the intervention by the participants of both intervention and control groups to ensure the durability of learning. To observe ethical considerations, the educational contents were also taught to the students of the control group.

The collected data were analyzed using SPSS software, version 18. Independent t-test, repeated measures analysis of variance and Post-Hoc Bonferroni were used. The significance level was set at <0.05.

Result

We enrolled 168 girl students whose mean age (±SD) was 15.7(0.6) years.48.7% of the students' fathers were self-employed and almost 76.4 % of their mothers were housewives. Majority of the students in both groups (38% intervention, 26% control group) had fathers with high school diploma. Most of the students in the intervention group had mothers with high school diploma (36%) and most of them in the control group had mothers with lower secondary education (23%). 12 students in the intervention group and 22 in the control group, whose mean age (±SD) of incidence was 11.4 (3.9) years, had a history of UTIs. No difference was found between the two groups in terms of demographic variables except for parental level of education (Table 1).

Independent t-test was used to compare the mean scores (±SD) of knowledge, HBM constructs and preventive behaviors of UTI in the participants of intervention and control groups. Moreover, repeated measures analysis of variance and Bonferroni post hoc tests were used to compare the mean scores at three measurement time points; before, immediately after and one month after the intervention. Accordingly, we observed a significant difference between the knowledge mean scores before and after the intervention in the intervention group (P<0.001) (Table3).

Before the intervention, there were significant

Table 1: Age and history of UTIs in the participants of intervention and control groups

Variable	Group		P value
	Intervention (n=86)	Control (n=86)	
Age mean ± SD	14.9±0.6	15.1±0.7	0.122
History of previous infection (yes/no) n (%)	12 (14.3)	22 (26.2)	0.055
Number of infection episodes mean±SD	1.6±0.9	1.8±1.6	0.701
Age of incidence mean±SD	11.1±3.6	11.6±4.1	0.757

Independent t-test was used

Table 2: Comparison of the mean scores (±SD) of HBM constructs in the participants of intervention and control groups; before, immediately after and one month after the intervention

Group		Intervention Group (mean ±SD)		P * value		Control Group (mean ±SD)		P* value	P value** between the groups		
Time / Variable	Before the intervention	Immediately after the intervention	One month after the intervention	Between three time points	Before the intervention	Immediately after the intervention	One month after the intervention	Between three time points	Before the intervention	Immediately after the intervention	One month after the intervention
Perceived Susceptibility	16.6±2.8	20.0±2.1	19.9±2.1	<0.001	18.8±3.1	17.6±3.3	17.9±3.1	0.010	<0.001	<0.001	<0.001
Change	3.4±2.1				-1.2±3.6				<0.001		
Perceived severity	15.9±3.2	19.3±2.5	18.6±2.6	<0.001	18.2±2.8	17.3±2.9	17.9±2.8	0.065	<0.001	<0.001	0.077
Change	3.3±2.4				-0.8±3.8				<0.001		
Perceived Barriers	16.5±3.4	20.2±2.7	19.7±2.4	<0.001	16.9±3.5	17.0±3.4	16.8±3.9	0.907	0.510	<0.001	<0.001
Perceived Benefits	18.4±3.5	21.8±2.7	21.8±2.6	<0.001	19.5±2.8	19.1±2.9	19.4±2.5	0.479	0.034	<0.001	<0.001
Change	3.4±3.0				-0.3±3.2				<0.001		
Cues of actions	13.9±4.3	21.3±3.2	21.3±2.9	<0.001	17.3±4.9	17.5±4.9	17.3±4.2	0.894	<0.001	<0.001	<0.001
Change	7.3±4.5				0.1±4.4				<0.001		
Self-efficacy	18.0±4.4	23.5±3.5	22.5±3.5	<0.001	19.0±4.4	19.1±4.5	19.5±3.4	0.381	0.174	<0.001	<0.001
Total beliefs score	99.6±12.7	126.3±9.8	124.2±10.1	<0.001	109.9±12.8	107.9±12.4	109.1±12.4	0.250	<0.001	<0.001	<0.001
Change	26.7±11.1				-2.0±12.9				<0.001		

*By using Repeated Measures ANOVA,**By using independent t-test

Table 3: Comparison of the mean scores (±SD) of knowledge and preventive behaviors of UTI in the participants of intervention and control groups; before, immediately after and one month after the intervention

Group		Intervention Group (mean ±SD)		P * value		Control Group (mean ±SD)		P* value	P value** between the groups		
Time / Variable	Before the intervention	Immediately after the intervention	One month after the intervention	Between three time points	Before the intervention	Immediately after the intervention	One month after the intervention	Between three time points	Before the intervention	Immediately after the intervention	One month after the intervention
Knowledge	7.0±1.8	11.9±1.4	9.9±1.7	<0.001	6.7±2.1	6.2±2.2	6±2.1	0.055	0.305	<0.001	<0.001
Behavior	64.9±9.1	73.3±7.9	73.1±7.6	<0.001	65.8±11.1	66.5±11.3	66.1±10.5	0.834	0.571	<0.001	<0.001

*By using Repeated Measures ANOVA,**By using independent t-test

differences between the two groups with respect to the mean scores of perceived susceptibility, perceived severity, perceived benefits, cues of action and total beliefs score. Therefore, the change of the mentioned components were also estimated and analyzed. The results showed that the mean scores of all HBM constructs significantly increased in the intervention group as compared with the control group (P<0.001) (Table2).

The mean scores of preventive behaviors increased in both groups after the intervention; however, such increase was only significant in the intervention group (P<0.001) (Table 3). On the contrary, we observed a decrease in the mean scores of knowledge, preventive behaviors and HMB constructs after one month; however based on Bonferroni post hoc test such decrease was only significant in the construct of perceived severity (P=0.022) and self-efficacy (P=0.003) and The mean score of all HBM constructs significantly decreased one month after the intervention (P=0.017).

Discussion

The results of present study confirmed the positive effect of peer education intervention, based on HBM, on increasing students' knowledge about UTIs. However, the results showed that the durability of their knowledge had decreased over time**.** To increase the durability, the educational contents should be repeated for the students regularly.

Several studies have supported our findings. Our result was consistent with another study which reported a significant increase in the mean knowledge scores of the participants in the intervention group after an educational intervention.[10] Similarly, in another study on the effect of education by peers and health personnel on the osteoporosis knowledge and health beliefs in adolescents with nephrotic syndrome, the mean knowledge scores significantly increased in both intervention and control groups immediately after the intervention but significantly decreased one month after the intervention.[25] Zahedian nejadi also demonstrated the positive effect of peer education on the knowledge of female high school students about stress management.[26]

Likewise, in some other studies on the effect of peer education on HIV prevention, the mean knowledge scores significantly increased in the participants of intervention group in comparison with their peers in the control group.[27, 28]The findings of the current study also showed a significant increase in the mean scores of HBM constructs and preventive behaviours immediately after and one month after the intervention in the partcticipants of the intervention group than those in the control group.A similar study assessed self-efficacy, perceived susceptibility and perceived severity in the patients with type 2 diabetes mellitus after an educational program. In contrast with our findings, the results of the aforementioned study indicated that the mean scores of perceived severity of UTIs and perceived susceptibility to related health risks increased in the patients of both groups; however, the increase was significantly higher in the intervention group than in the control group .Similar to our findings, the participants of both groups reported an increase in self-efficacy scores; while, the scores were significantly higher in the patients who attended the educational program than their counterparts in the control group.[29]

Another study, by Gozum and colleagues , on the effect of peer education on breast cancer screening and health beliefs in Turkish women showed that the mean scores of HBM constructs (except perceived susceptibility) significantly increased after the intervention. Furthermore, the mean scores of perceived barriers significantly decreased among their participants.[22] Our findings were in contrast with that of the mentioned study with respect to two constructs of perceived barriers and susceptibility. Gozum believes that lack of significant increases in these two dimensions may be due to the differences in the educational levels and skills of peer educator; while, in the present study all of our participants were at the same educational level.

Sharifi-rad and colleagues conducted a study to evaluate the effect of health education, based on HBM, on preventive actions of smoking in first-grade middle school students. Their findings were similar to ours in that the mean scores of all HBM constructs and behaviors increased in the students who attended the educational program; but different from ours in terms

of changes in perceived barriers.[30] Our findings also supported the results of another study which evaluated the effect of education based on HBM on promoting preventive behavior of cutaneous leishmaniasis and reported significant differences between the scores of all HBM constructs before and two months after the intervention.[31]

Hashemiparast and colleagues conducted a study on design and evaluation of educational interventions based on HBM to promote preventive behaviors of UTI in mothers with children less than 6 years. Their findings were in contrast with ours in that their educational intervention could significantly increase the scores of perceived severity, perceived benefits and self-efficacy in mothers one month after the intervention; while no statistically significant changes were observed in the constructs of perceived susceptibility, perceived benefits and cues of action.[8]

Another similar study on behavioral promotion of UTI prevention in pregnant women, reported a significant difference between the mean scores of all HBM constructs before and one month after the intervention.[10] Similar to our findings, Javaheri Tehrani and Nikpour observed a significant difference between the mean total scores of healthy behaviors in the women of the intervention groups and their peers in the control group.[1]The findings of another study which investigated the effect of peer education based on HBM on nutrition behaviors in primary school boys were consistent with ours in that they concluded this type of education could significantly increases the mean scores of HBM constructs and students' behaviors.[20]

Hence, the results of majority of studies conducted in the related field, either based on HBM or peer education approach or by incorporating peer education into the HBM, can promote individuals' healthy beliefs and preventive behaviors. Also in our study despite of limitations such as lack of intervention for the control group, finding suitable peer educator (accountable with good communication skills) and confined time for working with students(because of school programs and exams), Peer education seems to promote individuals' healthy beliefs and preventive behaviors, but more research is necessary in this field.

Conclusion

Peer education based on HBM can promote preventive behaviors of UTI and reduce the risk of the disease among first-grade high school female students. Our findings also emphasis the necessity of prolonged follow-ups to maintain positive behavioral changes in individuals. Peer education appear to be an appropriate approach for education and preventing health risk behaviors.

Acknowledgments

This manuscript has been derived from the thesis of Ms. Naval Heydari for Master's degree in community health nursing. The authors hereby thank Vice Chancellor for Research Affairs, Shiraz Department of Education, the officials and the students of the schools who took part in this investigation.

Conflict of Interest: None declared.

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