The effect of education based on empowerment model on knowledge, self-efficacy and practice of mothers with young girls for preventing of urinary tract infection

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Abstract

Urinary tract infectionis the most common bacterial infection among children. Girls after the age of one are exposed to the urinary tract infection on the average four times more than boys. The aim of this study was to determine the effect of training based on individual empowerment model on mothers' knowledge, self-efficacy and practice in prevention and early detect of the urinary tract infection in young kids. 104 mothers by means of random samples, participated in a quasi-experimental research in two groups consisting of test and control groups. the ways of gathering data consisted; demographic data, knowledge rate evaluation, self-efficacy and a check list of practice evaluation. The information was gathered from both groups after one month. The meetings were based importance, signs and prevention of the infection and recognition of infection that was made by mothers, themselves. Data was evaluated using SPSS-16, krukal wallis test, chi-square and t-test. There was a significant difference among self-efficacy scores in test group (regarding using urine strips and methods of prevention), practice scores (about the correct method of collecting urine samples, using urine test strips for detection of infection and methods of prevention) and knowledge scores (on function of kidney, importance of urinary tract infection, symptoms of infection and prevention methods) had significant difference before and after the intervention. This study showed that the use of individual empowerment model could improve mother's self-efficacy, practice and knowledge regarding primary and secondary prevention of their children urinary tract infection.

Keywords: Children, Knowledge, Mothers, Self-efficacy, Urinary Tract Infection

Introduction

Urinary Tract Infection (UTI) is applied in detection of various clinical conditions including: asymptomatic bacteruria to severe renal involvement and even sepsis [1]. UTI after respiratory and middle ear infections is the most common bacterial infection among children [2]. Based on global estimates, 150 million people suffer from UTIs annually [3]. The prevalence of UTI is 5% in developed countries and 20% in developing countries [4]. What is certain is that the incidence rate of UTI is significantly associated with gender and age in a way that after becoming one year

old, girls are four times more at risk of infection than boys. One of the most common causes of UTI in females is short urethra and the short distance between the anus and the urethra, which facilitates infection [5]. Complicated UTI is more common in children than in adults [6] and since there is no obvious clinical symptom, it causes an increase in complications such as recurrence and renal involvement, kidney stone formation, high blood pressure during pregnancy, financial problems, mental disorders, dialysis, kidney transplantation, and in some cases can be fatal in children [5,7].

In addition to the clinical symptoms of patient, UTI is diagnosed by microscopic and macroscopic methods. Nowadays a series of certain chemicals are put on a strip and used for rapid test as indicators [8]. Using urine test strip (Urine Dipstick) can have many applications for early diagnosis of UTI as an easy and economical tool [9,10]. Macroscopic examination of urine with urine dipstick is a fast and cost effective way to run a complete urine test and includes chemical pH test, nitrite, glucose, ketones, bilirubin, blood urobilinogen and protein. Enzymes of various bacteria in urine can break down urine molecules, release ammonia and increase natural pH [4,8] in urine which can be the sign of urinary infection [7]. Moreover, the gram-negative bacteria convert nutrient nitrate to nitrite. Positive nitrite is one of the symptoms of UTI [11]. UTIs in girls are mostly due to intestinal bacteria (gram-negative enterobacteria) [12].

Unawareness and failure to observe proper hygiene behaviors are inevitable in any society. Individuals and communities need training for proper health behaviors to learn and practice the right lifestyle, maintain health and prevent diseases [13]. In this regard, Mehrsay et al. investigated the underlying causes of delay in referral of children suffering from UTI to Sina and Bahrami hospitals from 2001 to 2007 and showed that the main reason for the delay in referral of children with UTI to hospital is parental education level and parental training is an important factor in the prevention of delayed referral of children [4].

Among the effective behaviors in prevention of UTI based on previous studies, are dressing ways, food habits, urination and defecation habits and cleaning method [14] Trainings on prevention of UTI in addition to the mentioned items, could include diagnosis of UTI using urine test strip, taking action after being suspected to UTI and cases of using test strips. Parent's consideration, especially mothers, to the mentioned points and knowledge of the symptoms and the disease diagnosis can play a significant role in the prevention of this disease in childhood. Women and mothers are considered as active members and beneficiaries in health promotion programs. Mothers are the first recipients of health care services among family members and tend to put their children and family in a higher status than their needs. The purpose of psychological and personal empowerment is to increase critical knowledge, self-efficacy, knowledge of the problem source, solutions and qualifications to do voluntary activities to fix the problems that have affected the quality of life. The basis of personal empowerment model is self-efficacy. Self-efficacy refers to believing in the ability to perform the behavior successfully in order to achieve the result [15]. Ultimately, applying the empowerment programs aiming to increase knowledge and self-efficacy would result in self-control and preventive behaviors that are essential for health and quality of life improvements [16,17]. Therefore, the present study was held with the aim to determine the effects of education based on personal empowerment model on knowledge, practice and self-efficacy of mothers in prevention and early detection of UTI in young girls in Fardis region of Karaj in 2011.

Method

The present study was quasi-experimental with a control group. Statistical population was mothers with daughters between 1 to 6 years old that were extracted from active records of two health centers in Fardis region of Karaj. Using the sample size formula,

finally 120 participants (60 in the control group and 60 in the experimental group) were selected to take part in the study. Please add the formula here. Random sampling was used to choose the samples. Active records of health centers were randomly selected, telephone contact with the parents were established and enrollment information was recorded in a separate file.

Inclusion criteria were as follows: mothers who were not a member of healthcare staffs and did not have any education in these fields (such as medical sciences, nursing, midwifery and family health), having 1- to 6-year-old daughters (the number of daughters in the family was considered to be at least one to two daughters) and their daughters did not have a history of UTI. The mothers whose daughters were diagnosed with UTI during the study or were unwilling to continue the cooperation were also excluded from the study.

Ethical considerations in this study were achieved by anonymity of the questionnaires, obtaining consent from participants and holding educational program for the control group after the second test. Experimental and control groups were selected so that the demographic variables are almost homogeneous.

Data collection tool was a researcher made questionnaire and included demographic information, knowledge, self-efficacy and practice checklist. The scientific validity of the questionnaires was approved by sending the questionnaire to 10 related professors and their corrective comments on the questionnaire were applied. Its reliability was confirmed through equivalent parallel test on 30 women (out of the area under study and equivalent to the target group) by Cronbach's alpha method (r=0.83). Demographic specifications of mothers were measured by 9 questions and mothers' knowledge was measured by 13 questions including: 4 tables having true or false options and 9 questions with four options. Question's score was determined to be (0 to 1). Self-efficacy was evaluated by 6 questions having always, sometimes, rarely and never and the scores (3 to 0) were given to the responses respectively. Questions regarding the mothers' practice included 20 questions which comprised 3 yes-no questions having (0 to 1) score and 5 tables with terms of always, sometimes, rarely and never which got (3 to 0) scores respectively. Scores were classified as follows: knowledge scores were graded as three levels such as good (17-25), fair (9-16.99) and weak (0-8.99) (score levels were classified based on the lowest and the highest scores of individuals for each variable separately at three levels of good, fair and poor).

Self-efficacy scores were classified based on 3 levels such as good (14-18), fair (7-13) and weak scores (0-6) and practice scores were classified based on 3 levels of good (34-48), fair (16.99-9) and weak (0-16).

Firstly, pretest was administered for the two groups and based on the acquired scores, educational content for the experimental group was provided.

Experimental group was divided into 3 groups of 20 individuals. Each group's session was held in three sessions each lasting for an hour and 30 minutes in clinic's health unit.

Group meetings	
Session one	Mothers role in prevention of UTI, importance and complications of UTI, an overview of the function and structure of kidney and urine tracts, definition of UTI
Session two	Classification of urinary tract infections, UTI symptoms in children, factors affecting UTI incidence, prevention of UTI in children at primary and secondary levels
Session three	UTI diagnosis using urine test strip (dipstick) and the necessary actions after suspecting to UTI (urine samples were collected from children who were present at the educational sessions. Urine test was firstly carried out by the researcher and then by mothers.)

Educational methods used were presentation, group discussion and question and answer at the end of the sessions. The video projector was used as an educational tool. At the end of the training sessions, educational pamphlets were given to the target group members. Clinical setting was also equipped by posters after running the initial test for experimental

group. After a month, the questionnaire was given to and completed by the experimental and control groups again. Data results were evaluated and analyzed in SPSS-16 software using Chi-square, paired t-test and Kruskal-Wallis test.

Results

Based on the data in Table 1, 61.5% of the experimental group and 51% of the control group had high school education, 96.2 % of the experimental group and 92.3 % of the control group were housewife, and 55.8% of the experimental group and 46.2 % of the control group had only one daughter. The paired t-test showed that the mean scores before and after intervention in knowledge, practice and self-efficacy domain were significant in both experimental and control groups (P<0.001, Table 2). Based on the findings in Table 3, no significant difference was observed between self-efficacy and practice scores of the experimental and control groups before the intervention (P>0.05), but the chi-square test indicated a significant difference between self-efficacy in experimental and control groups

Table 1 *Comparison of demographic variables between the two groups under study (number of participants in each group is 52 people)*

Variable		Experimental group	Control group	P-value*
		N(%)	N(%)	
Mother's education level	Elementary school	1 (1.9)	4 (7.8)	0.47
	Middle school	8 (15.4)	9 (17.6)	
	High school	32 (61.5)	27 (51)	
	university	11 (21.2)	12 (23.5)	
Mother's job	housewife	50 (96.2)	48 (92.3)	0.40
	employed	2 (3.8)	4 (7.7)	
Mother's age	≤29 years old	16 (30.8)	20 (39.2)	0.66
	3040- years old	34 (65.4)	30 (56.9)	
	>40 years old	2 (3.8)	2 (3.9)	
Marital status	married	52 (100)	51 (98)	0.31
	widowed	0 (0)	1 (2)	
	divorced	0 (0)	0 (0)	
Number of children	1	29 (55.8)	24 (46.2)	0.24
	2	15 (28.8)	23 (44.2)	
	3	8 (15.4)	5 (9.6)	
Daughter's age	≤2 years old	5 (9.6)	10 (19.2)	0.16
	36- years old	47 (90.4)	42 (80.8)	
Number of daughters between 1 to 6 years age in the family	1	46 (88.5)	48 (92.3)	0.50
	2	6 (11.5)	4 (7.7)	

*Chi-square

Table 2 *Comparison of Mean (±SD) of personal empowerment constructs score before and after the intervention separately in experimental and control groups*

	Self-efficacy			Practice			Knowledge		
	before	after	P-value*	before	after	P-value*	before	after	P-value*
experimental	12.39 ±2.06	16.07 ±91.64	0.001	35.73 ±5.32	43.07 ±3.44	0.001	17.21 ±3.84	21.31 ±2.68	0.001
control	11.85 ±1.64	12.30 ±2.17	0.18	34.03 ±7.07	34.50 ±7.35	0.62	14.57 ±4.21	14.79 ±4.17	0.12

*Paired t-test

after intervention (P<0.001).

Results in Table 3 showed that in knowledge scores, a significant difference was observed between the pre and post-intervention scores of the experimental group (P<0.001) and the Wilcoxon test for paired comparisons (due to abnormal distribution of experimental and control groups), showed a significant difference between the pre and post-intervention scores of the control group (P = 0.01).

Table 3 *Distribution of scores level (%) of questionnaire constructs for experimental and control group separately*

		Before intervention			After intervention		
	Scores level	Experimental	Control	P	Experimental	Control	P
Self-efficacy	weak	2	1.9	0.06	0	2	0.001
	fair	62.7	82.7		11.5	73.5	
	good	35.3	15.4		88.5	24.5	
Practice	weak	0	3.8	0.36	0	3.8	0.001
	fair	34.6	32.7		1.9	30.8	
	good	65.4	36.5		98.1	65.4	
Knowledge	weak	1.9	9.6	0.11	0	5.8	0.001
	fair	52.7	51.9		9.6	38.5	
	good	45.4	38.5		90.4	55.8	

Discussion

This study showed that educational intervention has been effective on the knowledge, practice and self-efficacy based on personal empowerment model's structures in the experimental group (P<0.05). Basically, education is the first practical strategy for teaching, designing and implementing the empowerment programs. In educating process, information and messages are transmitted and knowing that in the present age information is the source of power and in fact it is the exact power, hence widespread public access to information is accounted as a key step in the empowerment process. Based on this model, achieving personal empowerment includes acceptance and power recognition that an individual could obtain [18]. Results of the investigations show that health behaviors and habits have a very important role in UTI incidence. Hence by being aware of the urinary risk factors and making changes in health behaviors, an effective step could be taken in reducing UTI in girls [14]. The findings of this study demonstrate the effectiveness of educational programs to promote the knowledge of experimental group regarding the prevention of UTI which is in line with the findings of Taghdisi, Karimi and Masoudi's study [14,18,19]. The significant increase in practice score of the experimental group reveals the impact of the educational program on maternal effective behaviors in preventing UTI. Similarly, mothers' practice in proper use of the urine test strips (steps of use and paying attention to nitrite indicator on test strip) and the proper urine sampling way has a significant increase which is in line with Kopra Takol and Masoodi's studies.

Moreover, results of the present study showed that the educational program based on personal empowerment model has resulted in the increase of mothers' self-efficacy scores in the experimental group from 17.21 to 21.31 which are consistent with Barber (2009) studies [21]. Self-efficacy is the main purpose in behavior change interventions in the health issue. High self-esteem and self-efficacy cause the increase of ability, capability, competence and the adequacy and one feels that he has a useful and effective life [22].

Conclusion

Personal empowerment program is an applicable tool that causes increase and promotion of knowledge and skill in individuals and implementing its strategies is an apparent goal to improve communities' health. Results of this study showed that the use of personal empowerment educational model can lead to self-efficacy, mothers'

knowledge and practice improvements in prevention and early detection of UTI in children. Except infancy, females are 10-30 times more than males at risk of UTI and the recurrence possibility of infection in females is 50% or more. UTI is an important factor in kidney damage, high blood pressure, kidney stone formation in childhood and causes many problems in older ages [23]. According to the present study, empowerment mothers would be able to have more control to eliminate this disease through the given information regarding the kidney functions, the importance of UTI in children and symptoms of urinary infection and ways of preventing the UTI such as paying attention to nutrition, cloth type and following hygiene tips. Since most of females' UTI are caused by Enterobacteriaceae and the presence of these bacteria causes color changes of nitrite indicator in urine test strip, mothers could be helped in early diagnosis of UTI by proper education. Therefore, self-medication as well as delay in referral of children to the physician and ultimately the occurrence of serious complications in children can be prevented. Similarly, using group discussion method of teaching in this study could be the other strength point of this study. This is because mothers can make use of each other' experiences during the sessions and the trained mothers could be considered as a source for teaching to their peers. The importance of primary prevention of diseases is obvious to everyone, but the secondary prevention that consists of rapid detection and treatment of disease, can have a very effective role especially in rural and disadvantaged areas such as Fardis of Karaj region. Mothers' participation in diagnosis of the disease and following the necessary tips in prevention of UTI in practice and self-efficacy field, could distinguish this model from other educational programs which merely emphasize on audience knowledge. In order to assess more effectiveness from this educational model, it is suggested that:

Educational programs get examined based on personal empowerment model in women's different groups and the long term effect of the educational program based on personal empowerment model in the mentioned target group be followed and evaluated as well so that the effectiveness of this study would be observed. Limitations of the present study can be mentioned as the lack of similar study regarding individuals training to use urine test strip for the diagnosis of UTI. Furthermore, problems related to the implementation and follow-up intervention programs in informal groups such as housewife mothers regarding the timing can be pinpointed. Therefore, the implementation of these types of programs in formal groups can be done with a greater ease.

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Contributions

Study design: FBS, RB, MHT, DSH
Data collection and analysis: AFH, FBS
Manuscript preparation: FBS

Conflict of interest

"The authors declare that they have no competing interests."

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