

Research Article

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## Evaluation of Knowledge, Attitude, and Practice of Mothers Presenting to Pediatric Clinic Regarding Urinary Tract Infection Prevention in Children

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**Introduction:** Urinary tract infection is one of the most common bacterial infections in children. It is preventable in many cases and appropriate health behaviors can protect a child from the disease or minimize its risk. Considering the relatively high prevalence of urinary tract infections in children and with regard to the important role of healthy behaviors in preventing this infection, we decided to evaluate the knowledge, attitude and practice of mothers regarding the prevention of urinary tract infections.

**Materials and Methods:** This cross-sectional descriptive-analytic study was performed in the Pediatric Clinic of Imam Khomeini Hospital to determine the knowledge, attitude, and practice of mothers about UTI in children and to evaluate its relationships with some demographic features. The data collection tool was a researcher-made questionnaire based on the literature review. The collected data were analyzed using SPSS 22 software and P-values less than 5% were considered significant.

**Results:** One hundred and fifteen mothers who presented to the Pediatric Clinic of Imam Khomeini Hospital participated in this study. The average knowledge, attitude, and practice score in the first part and the practice score in the second part was 6.21, 47.85, 13.86, and 10.66, respectively.

A statistically significant relationship was found between the score of knowledge and attitude. The knowledge score had a significant relationship between maternal employment status, household income, and household location. There was also a significant relationship between access to information and both the knowledge and attitude scores.

**Conclusions:** The significant relationship between access to information resources and the maternal knowledge and attitude scores confirms the importance of awareness in improving the knowledge of mothers in preventing urinary tract infection.

**Keywords:** Knowledge; Attitudes; Practice; Urinary Tract Infections; Pediatrics.

**Running Title:** A KAP Study of Children with UTI

### Introduction

Urinary tract infection is one of the most common bacterial infections in children. It is estimated that about 150 million patients are diagnosed with urinary tract infections annually [1]. After respiratory tract infections, UTIs are the second cause of infectious diseases in children [2]. Moreover, UTI is a relatively common disease in Iranian children.

Although, mortality from this disease is approximately zero with advances in modern diagnostic and therapeutic methods, untreated urinary tract infections are associated with severe and irreversible complications such as renal failure, high blood pressure, and inadequate childhood growth [3,4].

Many cases of UTI in children are preventable and appropriate health behaviors can protect a child from the disease or minimize its risk [5]. Many factors contribute to the development of this disease, which can be related to the low level of family health information about child care, such as using suitable underwear, washing methods, gastrointestinal tract infections, etc. [6,7].

Since mothers are more involved in child care than fathers are in Iranian society, their knowledge, attitude and practice about prevention of UTI are of great importance [7]. Considering the relatively high prevalence of urinary tract infections in children and the associated acute and chronic complications, and with regard to the important role of healthy behaviors in preventing this infection, we decided to evaluate the knowledge, attitude, and practice of mothers about prevention of urinary tract infections.

### Materials and Methods

This cross-sectional descriptive-analytic study was performed in the Pediatric Clinic of Imam Khomeini Hospital to determine the knowledge, attitude, and practice of mothers about UTI in children and to evaluate its relationship with some demographic features.

Our samples were selected from mothers that presented to the Pediatric Clinic of Imam Khomeini Hospital during 2017-2018.

The Tehran University of Medical Sciences Sample Size Calculator was used to calculate the sample size [8]. With an error of  $\alpha=5\%$ , a study power of 80%, and the prevalence calculated by conducting a pilot study, the sample size was estimated at about 115 subjects.

According to the pilot study, the knowledge of 50% of the mothers was in an acceptable level.

The pilot study was conducted in 30 mothers using a test re-test approach with two purposes: to estimate the prevalence and to evaluate the reliability of the questionnaire.

The inclusion criteria were informed consent to participation in the study and lack of referral to the nephrology clinic. Trained personnel were considered to assist mothers who were not able to read and write.

The objectives of the study were explained to the participants and the mothers entered the study voluntarily. This study did not impair or interfere with health services. Moreover, the protocol of the study was reviewed and approved by the Vice-Chancellor of the Ethics Committee of Tehran University of Medical Sciences (IR.TUMS.VCR.REC.1396.2623, registration number: 22786).

The data collection tool was a four-part researcher-made questionnaire based on a review of the literature [7,9]. Part one had 12 questions about maternal demographic information. Part two contained 10 multiple choice questions about maternal knowledge. Part three included 12 phrases about maternal attitudes based on a Likert scale, and part four contained 14 phrases about maternal practice regarding UTI prevention in children based on a Likert scale. The practice section comprised two parts: the first part was for all participants and the second part was related to mothers with a positive history of UTI in their children. One of the goals of these two parts was to differentiate individuals with a history of UTIs from other mothers and to increase the accuracy of the study. The main objective of dividing the questions of the practice part to two parts was that measurement of practice through a questionnaire might not be very accurate. The validity of the questionnaire was reviewed by pediatric nephrology professors who were experts in the subject. The reliability of the questionnaire was also assessed through a pilot questionnaire in a study of 30 people with a test re-test approach using the Cronbach's alpha coefficient and Kuder-Richardson index. Alpha cronbach was 0.45 (since this questionnaire consisted of multiple choice questions, we used Kuder-Richardson index to confirm the reliability of this part of the questionnaire) and the Cronbach's alpha coefficient was 0.71 for the attitude part and 0.76 for the practice part.

In the knowledge part, the minimum score was zero and the maximum score was 10. The scores ranged from 0 to 60 in the attitude part. The

minimum score was 0 and the maximum was 16 in the first part and the minimum was 0 and the maximum was 12 in the second part of the practice questions.

The collected data were analyzed with the SPSS 22 using chi-square and t-test tests. P-values less than 5% were considered significant.

### Results

The demographic characteristics of the participants are shown in Table 1. The mean age of the subjects was  $33.6 \pm 6.44$  years. The average number of children was  $1.62 \pm 0.7$ .

**Table 1.** Demographic Status

<b>Education</b>	Illiterate	2 (17%)
	Elementary	6 (5.2 %)
	Secondary	50 (43.5%)
	Academic	57 (49.6 %)
<b>Employment status</b>	Housekeeper	71 (61.7%)
	Employed	44 (38.3 %)
<b>Family income</b>	<500	6 (5.2 %)
	500-1	33 (28.7 %)
	>1	74 (64.3 %)
<b>Household location</b>	City	92 (80%)
	City margin	14 (12.2%)
	Country	8 (7%)
<b>Child care</b>	House	98 (85.2%)
	Kindergarten	8 (7%)
	Relatives	9 (7.8%)
<b>Past history of UTI</b>	Yes	18 (15.7%)
	No	97 (84.3%)
<b>Access to healthcare</b>	Yes	114 (99.1%)
	No	1 (0.9%)
<b>Access to information</b>	Yes	97(84.3%)
	No	18 (15.7%)

The average knowledge score was  $6.21 \pm 2.033$  (range= 2-10). The mean score of attitude was  $47.85 \pm 5.791$ , ranging from 31 to 59. The mean score of the mothers' practice in the first part of the questionnaire was  $13.86 \pm 2.52$ ; the lowest score in this part was 5 and most of the participants scored 16. Mothers with a history of UTI in their children had an average practice score of  $10.66 \pm 1.54$ . Most of the participants scored 12 in this part (Table 2).

A cut-off point of 75% or higher was defined as the level of acceptance in knowledge, attitude and practice scores. Forty-seven (40.9%) and 18 (15.7%) participants had acceptable scores in the knowledge and attitude sections, respectively. As for practice, 81.7% of all participants and 86.8%

of the mothers with a history of UTI in their children were in an acceptable range (Table 3).

**Table 2.** KAP Scores

	K	A	P 1	P 2
<b>Mean</b>	6.21	47.85	13.86	10.66
<b>Median</b>	6.00	48.50	15.00	11.00
<b>Mode</b>	6	49	16	12
<b>St. dev.</b>	2.033	5.791	2.526	1.547
<b>Min</b>	2	31	5	6
<b>Max</b>	10	59	16	12

KAP=Knowledge, Attitude, Practice

K=knowledge, A=attitude, P1=first part of practice,

P2=second part of practice

**Table 3.** KAP Scores after grouping\*

	K	A	P1	P2
<b>Acceptable</b>	47 40.9%	18 15.7%	94 81.7%	<b>33</b> <b>86.8%</b>
<b>Non Acceptable</b>	68 59.1%	88 76.5%	17 14.8%	<b>5</b> <b>13.2%</b>
* cut off of 75% or higher as the level of acceptance				

A statistically significant relationship was found between the knowledge score of the mothers and their attitude toward urinary tract infection. (P-value=0.035) The knowledge score had a statistically significant correlation with maternal employment status, household income, and household location. (P-values=0.002, 0.004, 0.030, respectively) There was also a significant relationship between access to information from different sources and both knowledge and attitude scores. (P-value=0.035, 0.02, respectively) (Table 4,5). Practice did not have any significant correlations with education, employment status, family income, household location, child care place, healthcare access, and access to information.

### Discussion

The results showed that a better higher employment status, household income, household location, and access to information had a positive effect on the mothers' knowledge of UTI. Moreover, a significant relationship was found between the mean score of knowledge and attitude towards UTI.

**Table 4.** Relation between KAP and demographic status

		Knowledge			Attitude			Practice 1		
		Acceptable	Non Acceptable	P-Value	Acceptable	Non Acceptable	P-Value	Acceptable	Non Acceptable	P-Value
Employment status	Housekeeper	21 (29.6%)	50 (70.4%)	0.002	11 (15.9%)	58 (84.1%)	0.446	58 (82.9%)	12 (17.1%)	0.341
	Employed	26 (59.1%)	18 (40.9%)		7 (18.9%)	30 (81.1%)		36 (87.8%)	5 (12.2%)	
Family income	<500	1 (16.7%)	5 (83.3%)	0.004	1 (16.7%)	5 (83.3%)	0.761	3 (50%)	3 (50%)	0.807
	500-1	6 (18.2%)	27 (81.8%)		4 (12.1%)	29 (87.9%)		29 (90.6%)	3 (9.4%)	
	>1	38 (51.4%)	36 (48.6%)		13 (20%)	52 (80%)		60 (84.5%)	11 (15.5%)	
Household location	City	42 (45.7%)	50 (54.3%)	0.030	17 (20%)	68 (80%)	0.387	76 (84.5%)	13 (14.6%)	0.891
	City margins	1 (7.1%)	13 (92.9%)		1 (8.3%)	11 (91.7%)		11 (78.6%)	3 (21.4%)	
	Country	3 (37.5%)	5 (62.5%)		0	8 (100%)		6 (85.7%)	1 (14.3%)	
Information access	Yes	44 (45.4%)	53 (54.6%)	0.035	18 (20.5%)	70 (79.5%)	0.025	80 (86%)	13 (14%)	0.284
	No	3 (16.7%)	15 (83.8%)		0	18 (100%)		14 (77.8%)	4 (22.2%)	
Education	Illiterate	0	2 (100%)	0.094	0	2 (100%)	0.110	2 (100%)	0	0.908
	Elementary	3 (50%)	3 (50%)		1 (20%)	4 (80%)		5 (83.3%)	1 (16.7%)	
	Secondary	15 (30%)	35 (70%)		4 (8.2%)	45 (91.8%)		43 (86%)	7 (14%)	
	Academic	29 (50.9%)	28 (49.1%)		13 (26%)	37 (74%)		44 (83%)	9 (17%)	
Child care	House	37 (37.8%)	61 (62.2%)	0.064	15 (16.1%)	78 (83.9%)	0.699	82 (85.4%)	14 (14.6%)	0.595
	Kindergarten	3 (37.5%)	5 (62.5%)		2 (28.6%)	5 (71.4%)		7 (87.5%)	1 (12.5%)	
	Relatives	7 (77.8%)	2 (22.2%)		1 (16.7%)	5 (83.3%)		5 (71.4%)	2 (28.6%)	
Access to health care	Yes	46 (40.4%)	68 (59.6%)	0.409	18 (17.12%)	87 (82.9%)	0.830	93 (84.5%)	17 (15.5%)	0.847
	No	1 (100%)	0		0	1 (100%)		1 (100%)	0	
Past history of UTI	Yes	9 (50%)	9 (50%)	0.273	3 (17.6%)	14 (82.4%)	0.586	15 (83.3%)	3 (16.7%)	0.550
	No	38 (39.2%)	59 (60.8%)		15 (16.9%)	74 (83.1%)		79 (84.9%)	14 (15.1%)	

However, the mothers' knowledge and attitude had no significant relationship with their practice. A study of the effect of the mothers' preventive behaviors on prevention of UTI in their young girls by Baghiani et al showed that using the Health Belief Model as a tool to increase maternal knowledge about UTI could improve their preventive behaviors [9]. This was supported by

another study conducted by HashemiParast et al. in mothers with children younger than 6 years old. In this study, designing an educational intervention based on the Health Belief Model increased the mothers' self-efficacy in taking preventive measures against development of UTI in their children [7].

**Table 5.** Relationship between KAP components

		K		A		P1	
		a	na	a	na	a	Na
K	a			12(26.7%)	33(73.3%)	35(81.4%)	<b>8(18.6%)</b>
	na			0(9.8%)	55(90.2%)	59(86.6%)	<b>9(13.2%)</b>
P-V				0.02		<b>0.307</b>	
A	a	12(66.7%)	6(33.3%)			16(88.9%)	<b>2(11.1%)</b>
	na	33(37.5%)	55(62.5%)			71(83.5%)	<b>14(16.5%)</b>
P-V		0.02				<b>0.438</b>	
P1	a	35(37.2%)	59(62.8%)	16(18.4%)	71(81.6%)		
	na	8(47.1%)	9(52.9%)	2(12.5%)	14(87.5%)		
		0.307		0.438			

**a= acceptable, na= non acceptable, P-V= p value, K= knowledge, A= attitude, P=practice**

Despite these findings, we failed to show any significant relationship between the mothers’ knowledge, attitude, and demographic status and their practice regarding UTI prevention in their children. This could partly be explained by the fact in the Iranian society, the level of one’s performance in child care is directly influenced by the experiences of their close relatives regardless of their level of information. However, this point needs to be more thoroughly explored by larger studies in larger sample sizes. In addition, in future studies, instead of using a questionnaire (used in this study) to evaluate the practice level of mothers, a practical exam can be performed to evaluate their performance more accurately. Another explanation for the lack of relationship between knowledge and practice in this study could be the fact that higher knowledge does not necessarily mean better performance, and other factors play significant roles in the process of transforming knowledge into performance. The results of this study showed a strong correlation between the mothers’ level of knowledge and their attitude towards UTI. Moreover, most of the 20 parents with a history of prior UTI in their children interviewed in Harmsen et al. study complained of the lack of awareness about UTI severity. They believed this was due to the fact that health practitioners usually failed to mention the consequences of UTI [6]. These findings suggest that increasing mothers’ awareness using different methods and sources could change their attitude towards UTI and its severity as well as their preventive measures against its development. Studies have shown that any improve in the socio-economic level of the family can be effective in improving maternal awareness about UTI and reduce its incidence [6, 10-12]. The positive effect of the

better employment status of the mothers, higher family income, living in the city, and better access to information on their knowledge about UTI found in this study supports this finding of the previous studies.

This study found no significant relationship between the history of urinary tract infection and the knowledge, attitude and practice of mothers, which could be partly explained by the fact that mothers with a prior history of UTI in their children do not receive adequate information regarding the importance of this infection [13]. Therefore, planning proper educational programs for mothers with a history of urinary tract infections in their children could be effective in improving their KAP score regarding UTI and in preventing UTI recurrences in their family.

**Conclusion**

In conclusion, enhancing the mothers’ access to medical information and their socioeconomic status could improve their knowledge and attitude towards UTIs. However, neither a higher level of information nor a better attitude had significant effects on the mothers’ practice regarding UTI prevention in their children, which could partly be due to the weakness of a questionnaire as a tool for measuring practice. Studies of other factors affecting practice regarding UTI prevention using more accurate measurement tools for practice could shed more light on what can be done to improve prevention strategies for this common childhood infection.

**Conflict of Interest**

The authors have no conflict of interest to declare.

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