

# LEVEL OF KNOWLEDGE AND DETERMINANTS AMONG MINISTRY OF HEALTH PRIMARY HEALTH CARE PHYSICIANS REGARDING URINARY TRACT INFECTION MANAGEMENT IN CHILDREN AGED 1-36 MONTHS IN MAKKAH AL-MUKARRAMAH CITY SAUDI ARABIA, 2018.

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## Abstract

**Background:** despite multiple specialties dealing with UTI management in pediatric age group, level of knowledge is found to be varied among them in western surveys.

**Purpose:** to evaluate the knowledge regarding management of urinary tract infection in children among primary health care physicians and to improve quality of our primary health care.

**Methodology:** The study was conducted in the city of Makkah Al-Mukarramah included all primary health care physicians working in PHCCs in Ministry of Health. The sample size was 129 candidates. A self-administered questionnaire that has been validated in previously published study and admitted in the study. Permission by e-mail was taken to use the questionnaire. It includes three main sections; demographic questions, level of knowledge about diagnosis and finally the level of knowledge about treatment. The researcher visited the selected PHC centers after getting approval from MOH.

**Results:** weak knowledge about UTI diagnosis and management was recorded in 70% of participants. The score of knowledge was ranging from 4-21 with mean and SD 11.519+3.765. Total knowledge were markedly and statistically significant different in the area of experience, training, courses obtained about UTI and qualification (p values were 0.004, 0.048, 0.002 and 0.003) respectively.

**Conclusion:** level of knowledge is extremely weak and minute despite variety of specialties and board certified. Whatever the size of pediatric group diseased with UTI, family physician should be aware of the NICE guidelines of treatment.

## 1. Introduction

### 1.1 Background and Retreat Review

Urinary tract infection (UTI) is defined as a common bacterial infection involving the lower urinary tract (cystitis), the upper urinary tract (pyelonephritis), or both, causing illness in children. Recognizing and treating these infections promptly and accurately is important. UTI is associated with pyelonephritis, which has potential sequelae, including renal scarring. Untreated UTI can also lead to hypertension and end stage renal disease (1). Asymptomatic bacteriuria is the presence of bacteria in urine obtained in asymptomatic children (usually girls) on routine screening or incidentally during other investigations. Antibiotic treatment does not seem to help eliminate the bacteria, reduce recurrence, or prevent kidney damage (1).

UTI are Causes: > 95% of cases due to gram-negative bacilli such as Escherichia coli (E. coli), Klebsiella, Proteus, Enterobacter urinary tract infection (UTI) is a common disease in primary health care and may cause serious complications if misdiagnosed or inappropriate management(2). In our primary health care urine culture not available. The incidence of UTI depends on diagnosis and investigation. At least 8% of girls and 2% of boys will have had a UTI by the age of 7 years (3). The prevalence of UTI in children less than two years of age with an undifferentiated febrile illness is approximately 5% (4). Prevalence is higher in white than among black infants(5).

Girls have a two to a four-fold higher incidence of UTI than circumcised boys(6). according to American Academy of Pediatrics the age group of pediatrics from birth and continue to 21 years of age(7). The researcher considered age group 1 - 36 months because it may lead to critical complication (sepsis, end-stage renal diseases and hypertension) if misdiagnose. And this age group is mainly considered by the NICE guideline. A study conducted in Saudi Arabia (Jeddah) in 2015 to an assessment of Knowledge and Practices among Ministry of Health primary health care physicians regarding Urinary Tract Infections in Children. Revealed that high level of knowledge regarding the diagnosis of UTI and low of the level of knowledge regarding investigation and treatment. Also, the proper practice was relatively low among primary health care physicians. Older physicians were more knowledgeable and reported higher rate of appropriate practice than younger physicians (8). A large survey conducted in Europe to describe current practice among European pediatricians regarding diagnosis and management of UTI in children aged 1-36 months and to compare these practices with recently published guidelines. The survey involved 1292 pediatrician and Revealed that management of urinary tract infections is controversial and heterogeneous. Also, the study

concluded that it is important to develop easy to remember guidelines and to improve the educational strategies regarding UTIs in children (9).

A study conducted in Sweden in 2013 to determine the level of Awareness of antibiotic resistance in UTI treatment: A study among primary care physicians in Primary care in Kornberg, Sweden. Revealed that there was a hierarchical scale of how general practitioner viewed resistance as an issue in UTI treatment (10).

Another study found in the West of Ireland (County Mayo; total population 123,839 in 2006 Census). Published in January 2010 to determine a level of knowledge regarding the management of urinary tract infection in children among general practitioners in primary care and comparison with the NICE guidelines. Which revealed that a high level of clinical knowledge amongst general practitioners treating children with UTI in primary care. However, it also demonstrates high variation in practice about the detailed investigation and specialist referral (11).

A study conducted in South Wales Published on 16 Feb 2011 to estimate the Prevalence of urinary tract infection in sequential acutely unwell children presenting in primary care. Revealed that can be obtained urine samples from young children in primary care. However, urine sampling should be based on strong evidence, applicable guidance for clinicians (12). Prospective observational cohort (2015) conducted study in primary care sites in urban and rural areas in England and Wales to determine Childhood urinary tract infection in primary care: a prospective observational study of prevalence, diagnosis, treatment, and recovery revealed that more than 50 % of children with UTI on culture were not prescribed prophylactic antibiotics at first presentation (13).

A study conducted in England and Wales in 2016 to evaluate Improving the Diagnosis and Treatment of UTI in Children in Primary Care: Results from the DUTY Prospective Diagnostic Cohort Study. Revealed that a clinical rule depending on symptoms and signs is superior to clinician diagnosis and investigation for noninvasive urine sampling (14).

## 1.2 Rationale

- According to NICE guideline in children aged 1 - 36 months regarding diagnosis and management of UTI, mismanagement of UTI may lead to serious complication like sepsis, hypertension and ESRD.
- The researcher was a pediatrician in Saudi board of pediatric. He was facing difficulty regarding management of multiple cases of UTI among patients in same age group that raised his concern to conduct the study.
  - Up to the researcher knowledge, no similar studies were conducted in Makkah.

## 1.3 AIM OF THE STUDY:

To evaluate the knowledge regarding management of urinary tract infection in children among primary health care physicians.

## 1.4 OBJECTIVES:

1-To estimate the Level of Knowledge Among Ministry of Health Primary Health Care Physicians Regarding Urinary Tract Infection management in Children Aged 1-36 Months in Makkah Al-Mukarramah City Saudi Arabia

2- To identify Determinants among Ministry of Health Care

Physicians Regarding Urinary Tract Infection management in the same population in Makkah Al-Mukarramah City Saudi Arabia.

## 2. Methodology (Materials and Methods)

### 2.1 Study Design:

Cross-sectional study.

### 2.2 Study Area:

The study was conducted in the city of Makkah Al-Mukarramah (the holy capital).Makkah Al-Mukarramah is the holy city for all Muslims and is located in the western region as Makkah region. All health facilities under the control of General health affairs directorate in Makkah region. There are three major sectors of PHCCs inside makkah city limit which are (Al-zaher, Al-Adal and Al-Kakiah).

### 2.3 Study Population:

All primary health care physicians working in PHCCs in Ministry of Health at three major sectors inside Makkah city limit.

### 2.4 Inclusion criteria:

- All PHC physicians who are work in PHCCs inside the three sectors in Makkah Al-Mukarramah during the period of study.
- Both males and females.
- All nationalities.
- All job descriptions (residents, specialist, and consultant).

### 2.5 Exclusion criteria:

- PHC physicians on leave during the study period.
- PHC physicians who are assigned to work outside the three sectors in Makkah Al-Mukarramah during the study period.

**2.6 Sample size:**

The sample size was calculated by using RAOSOFT sample size calculator assuming a 95% confidence level, 5% sampling error and 50% probability of prevalence. The minimum calculated sample was 129.

**2.7 Sampling technique:**

The total number of the three sectors is 208 as provided by administration of PHCCs .Al-Kakiah contains 75 physicians, Al-Adel contains 61 physicians, Al-Zaher contain 72 physicians. Based on that Al-Kakiah sector resemble 36 % of total physicians, while Al- Adel resemble 29 %, AL – Zaher resemble 35 %. Afterword the sample size (129 physicians) was distributed over three sectors according to this percentage as such using random sampling technique was applied to select the desired number of the physician from each sectors.

**2.8 Data collection tool:**

A self-administered questionnaire that has been validated in previously published study (8). Permission by e-mail was taken to use the questionnaire. It includes three main sections.

Demographics of the participants (age, gender, nationality, years of experience in PHC, work in the training center, courses, qualification and number of children seen in an average week during the last year as outpatients; questions to assess knowledge and practice regarding diagnosis, treatment and investigation of children UTI .Responses of the participants were assigned scores where right answers were assigned a score of “1” whereas wrong answers were assigned a score of “0”. Total scores of knowledge and practice were computed for every participant and the percentage of right knowledge and correct practice were estimated and utilized for comparison between them.

**2.9 Data Collection Technique:**

The researcher visited the selected PHC centers after getting approval from MOH. He got permission from directors of PHC centers and explained the purpose of the study to all physicians.

-The questionnaires was distributed to the physician by the researcher himself hand to hand for all physicians by the assistance of managers of PHC centers during their break of free time according to each physician in her or his clinic. After that, questionnaires were collected in the same way either immediately or after a period of time. With follow up through phone or e-mail to those who did not respond immediately.

**2.10 Study variables:****2.10 a .Dependent variable:**

Level of knowledge and determinants of the diagnosis and management of urinary tract infection

**2.10 b .Independent variables:**

These include socio-demographic variables such as age, gender, nationality, education, experience, work in the training center, courses, qualification

**2.11 Data entry and analysis:**

Computer programs with versions: (SPSS) statistical program for social sciences with a version should be specified (version 24)

**2.12 Pilots study/pretesting:**

A pilot study was conducted on 10% of target population one PHC center (Al-Eskan) to test the questionnaire's validity and timing required to answering and they were excluded from the main study.

**2.13 Ethical approval**

Permission from the joint program of family medicine in Makkah was obtained.

-Permission from the research committee in Makkah was obtained.

-Permission from the Directorate of Health Affairs of Makkah was obtained.

-All information were kept confidential, and results was submitted to the department as feedback.

**2.14 Relevance and expectation**

Level of knowledge about UTI management in pediatric age group is expected to be more than 80% in our sample

**2.15 Limitations:** No limitations**2.16 Budget:** Self-funded**RESULTS**

In our study, those below age of 30, from 30-40, from 40-50 and above 50 yes were found to be 29.5%, 51.9%, 10.9% and 7.8% respectively. The male gender constitutes 46.5%. Below 5 years' experience was found to be 43.4%. Training was established in 41.1% of study participants. About 40% of them have board in family medicine certificate and less than 50 children per week was 46.5%. Further information are illustrated in table 1 and figures 1-6

<b>Table 1: Descriptive statistics of our study variables.</b>		
<30		
30-40		
40-50		
>50		
<b>Gender</b>		
Male		
Female		
<b>Experiences</b>		
<5 years		
5-10 years		
10-15years		
>15years		
<b>Smoking</b>		
Yes		
No		
<b>Answers regarding UTI in children</b>		
Yes		
No		
<b>Qualification</b>		
Bachelor of medicine ,bachelor of surgery		
Graduate Diploma in Family Medicine (GDFM )		
Board in family medicine		
<b>How many children have you seen in an average week during the last year as patients?</b>		
<50		
50-100		
>100		

**Knowledge about treatment**

It has been found that 62% of participants correctly answer the proposed age of UTI in children. Fever, hematuria and abdominal pain were chosen by 88.4%, 48.1% and 55.8% of participants respectively. About 40% of participants mentioned constipation as the right answer for predisposing factor for UTI. Agreement with circumcision as a protective measure to UTI was found in 72% of participants. Further details in table 2.

<b>2: Knowledge about treatment questions.</b>		
<b>Important to consider the diagnosis of UTI in the following group of children (1 month to 36 months of age) with unexplained fever</b>		
All children (correct answer)		
Children <1 year old		
Children <2 year old		
Children with daytime enuresis		
<b>Which symptoms and signs suggest urinary tract infection to you in a child (1 month to 36 months of age)</b>		
Fever (correct answer)		
Hematuria (correct answer)		
Frequency (correct answer)		
Dysuria (correct answer)		
Abdominal pain (correct answer)		
Urgency (correct answer)		
Cloudy urine (correct answer)		
Vomiting (correct answer)		
<b>Which predisposing factors for UTI in children (1 month to 36 months of age) include</b>		
Constipation (correct answer)		
Family history of vesicoureteric reflux or renal disease (correct answer)		
Bath		
Wiping (Cleaning/washing) from back to front		
<b>Uncircumcised boys (1 month to 36 months of age) have a threefold decreased risk of UTI</b>		
I agree (correct answer)		
I do not agree		
I do not know		

### Knowledge about Investigation

As regard investigations, table 3 showed that 21.7% of participants choose infants as eligible age group to do US of bladder. Renal and bladder US was recommended as “do not mind with” in 24.8% of participants. Cystography was recommended by 10.1% of participants in infant age group only. Antibiotics were recommended for vesicoureteral reflux by 11.6%.

<b>Table 3: Knowledge and awareness of UTI proper investigations in our study.</b>		
<b>When performing a febrile UTI of a child (1 month to 36 months of age), renal and bladder ultrasound should be performed in</b>		
Children <12 months		
Children <2 years ( <b>correct answer</b> )		
Children 1-36 months		
<b>When ultrasound is recommended for a child (1 month to 36 months of age) with confirmed diagnosis of UTI, you will order</b>		
Ultrasound during the first 2 days of treatment		
Ultrasound at completion of treatment		
Ultrasound at any point in mind when ( <b>correct answer</b> )		
<b>When ultrasound is recommended for the following age group of children with confirmed diagnosis of UTI.</b>		
Children <12 months (Children <12 months) with febrile UTI		
Children <2 years with febrile UTI		
Children with UTI (febrile or not)		
Children with abnormalities revealed in the ultrasound ( <b>correct answer</b> )		
<b>When should you recommend antibiotic prophylaxis in the following children (1 month to 36 months of age) with Vesicoureteral reflux (VUR)?</b>		
Children with any grade of VUR		
Children with grade IV and V of VUR		
Children with grade III to V of VUR( <b>correct answer</b> )		
Do not prescribe antibiotic prophylaxis for any grade of VUR		
Do not know		

In table 4, catheter was the right answer for collecting samples and was chosen by 11.6% of participants. Suprapubic catheterization was done by participants rarely (17.8%). Urine dipstick was performed by 58.1% of our participants and chose either WBC or nitrates as markers of inflammation (55.8%, 47.3%) respectively.

<b>Table 4: Survey about method of collecting samples in suspected case of UTI.</b>		
	<b>N</b>	<b>%</b>
<b>Which is the method that you routinely use to collect urine from an infant &lt;3 months old.</b>		
Catheter ( <b>correct answer</b> )	15	11.6
Suprapubic aspiration	32	24.8
Clean catch	24	18.6
Bag	52	40.3
Other	5	3.9
<b>How often do you perform suprapubic aspiration in an infant &lt; 3 months with suspected UTI</b>		
Always	7	5.4
Sometimes	21	16.3
Rarely ( <b>correct answer</b> )	23	17.8
Never	78	60.5
<b>When there is a need to collect urine sample from a child 4 -36 months of age (who does not yet control his/her urine), what will be your preferred diagnostic step?</b>		
Advise the parent to collect urine by bag	46	35.7
Advise the parent to collect urine by clean catch	20	15.5
Ask a nurse / assistant at your practice to collect urine by bag or you do it yourself	35	27.1
Collect urine by catheterization ( <b>correct answer</b> )	22	17.8

Less than 25% of participants choose the right antibiotics to start with. Equality of oral and parenteral route efficacy was chosen by 52.7% of candidates. Antibiotic course (3-5) days was the correct answer as regard antibiotics course with or without fever and was chosen by 36.4% and 25.6% of participants for 10 days respectively as shown in table 5.

<b>Table 5: Knowledge of treatment survey.</b>		
<b>What is your first choice antibiotic when treating a child (1 month to 36 months of age) for UTI when culture and sensitivity results are available?</b>		
Cefixime ( <b>correct answer</b> )		
Cephalexin		
Second generation cephalosporin		
Amoxicillin		
Amoxicillin - clavulanic acid		
Ciprofloxacin		
Cotrimoxazole		
Other		
<b>Do you agree that parenteral antibiotic treatment is equally efficacious for children 2 months to 36 months of age?</b>		
I agree ( <b>correct answer</b> )		
I do not agree		
I do not know		
<b>How many days do you treat a child (1 month to 36 months of age) with afebrile UTI?</b>		
1-3 days		
3-5 days ( <b>correct answer</b> )		
7 days		
10 days		
14 days		
<b>How many days do you treat a child (1 month to 36 months of age) with febrile UTI?</b>		
1-3 days		
3-5 days		
7 days		
10 days ( <b>correct answer</b> )		
14 days		

The correct answer of starting antibiotics without waiting urinalysis and cultures was chosen by 7% of participants. However, only 11.6% of them chose the right answer of prescribing an imaging test for febrile UTI for a child as shown in table 6.

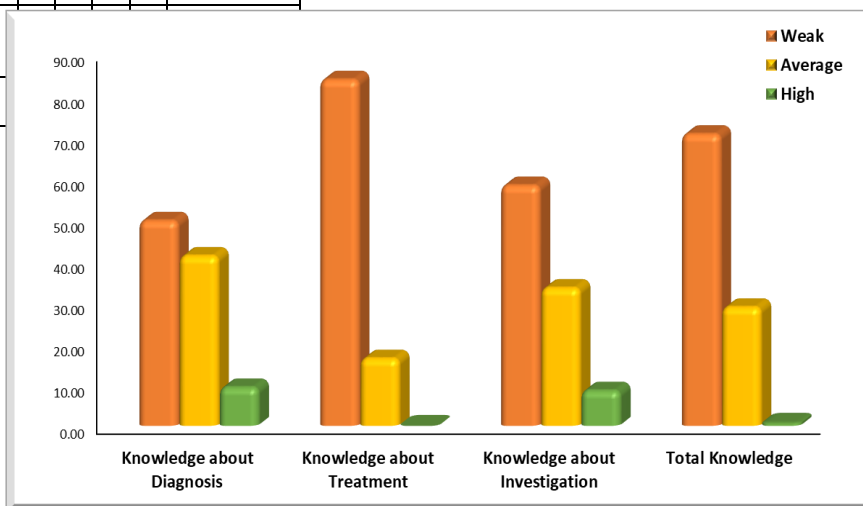
Table 6: Survey about role of urinalysis and imaging test in suspected cases of UTI.		
weekend (no way to ask for urine culture) and you have a child (1 month to 36 months of age) with suspected UTI and , what would you do?		
antibiotics immediately with no urine culture		
antibiotics after collecting urine to be stored in the fridge and sent on Monday for culture		
till Monday to ask for urine culture and then start antibiotics (correct answer)		
What is your practice concerning the imaging tests for a child (1 month to 36 months of age) following a febrile UTI?		
usually prescribe the investigation		
usually do an ultrasound and prescribe further investigations if needed (correct answer)		
for the child		

Interestingly, weak knowledge about UTI diagnosis and management was recorded in 70.5% of participants. The score of knowledge was ranging from 4-21 with mean and SD 3.765 as shown in table 7 and figure 7.

Table 7: Knowledge partitions in diagnosis, investigations and treatment.						
Knowledge	n	%	Mean	SD	Min	Max
Knowledge about Diagnosis				+3.276		
Knowledge about Treatment				+0.982		
Knowledge about Investigation						
Total Knowledge						

Weak (the score less than

50%), average (between 50% and 75%) and High (more than 75%).



**Statistical relationship between knowledge and study variables**

In table 8, multiple variables were tested against total knowledge and score plotted. Student t-test or ANOVA tests were used appropriately. It has been found that total knowledge were markedly and statistically significant different in the area of experience, training, courses obtained about UTI and qualification (p values were 0.004, 0.048, 0.002 and 0.003) respectively as highlighted in figure 8. All other variables were found to be not significant (Age, Gender, Nationality and How many children have you seen in an average week during the last year as outpatients?) where P-values equal (0.213, 0.858, 0.086 and 0.094) respectively.

Figure 1: Bar chart of knowledge partitions in diagnosis, investigations and

Table 8: Statistical relationship between total knowledge and study variables					
Variable	n	%	Mean	SD	ANOVA or T
					test
Gender					
Nationality					



	Non- $\chi^2$	10			
Experi	<5	10			0
	5-10	10			
	10-15	10			
	>15	10			
Tra		10			0
		10			
Courses regard UTI in chi		10			0
		10			
Qualific	Bachelor of med ,bachelor of su	10			0
	Graduate Diplo Family Med (GD	10			
	Board in fa med	10			
How many chil have you seen average week d the last ye outpati		10			
	50	10			
		10			

t: test value for T-test, f: test value for ANOVA

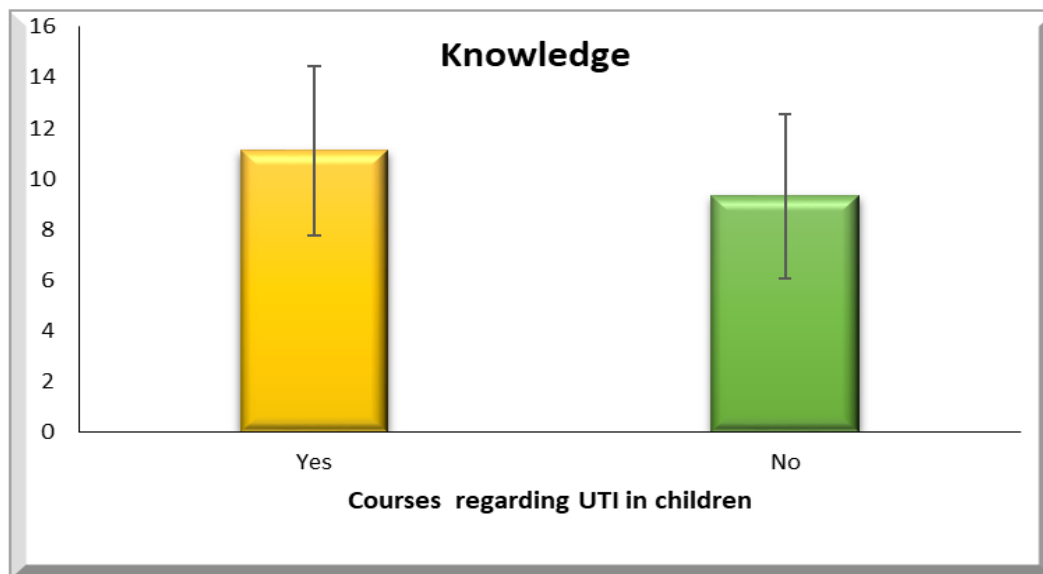


Figure 2: Bar chart of courses in children with UTI.

**4.DISCUSSION**

The most striking phenomena in our study is that there was heavy weakness in knowledge in guidelines of UTI management among responsible participants. Even consultation of less than 50 children per week is ominous finding. This study showed clear deviation from guidelines and practicing UTI management depending on no or less knowledge about international guidelines. It has been shown that childhood UTI's are often not recognized by general practitioners (15). Under-diagnosis of UTI in children is thought to be responsible for a significant number of patients developing end-stage renal failure as a consequence of acquired renal scarring (1, 3, 14). In the past, children with a confirmed UTI were thoroughly investigated so that any underlying predisposing cause was established. The new NICE guidelines place much less emphasis on advanced investigation. Their main thrust is to ensure that all children with UTI are correctly diagnosed and appropriately treated. The guidelines suggest this approach may be more effective in preventing acquired renal scarring.

As regard diagnosis of UTI. Participants failed to answer correct questions about epidemiology, symptomatology and risk factors of UTI. Several studies have reported on symptoms and signs in children

presenting with UTI to a hospital setting (13-15). Two studies have looked specifically at children presenting to a general practice (11, 12). In Al-Gabasani study at 2015 (8), there was discrepancy between knowledge of the primary health care physicians regarding diagnosis of UTI in children from one side and their knowledge regarding treatment as well as their practice from the other side. In a preverbal child, fever is consistently the most common symptom. Verbal children, like adults, most commonly present with dysuria and frequency. Other common symptoms include abdominal pain, loin tenderness, vomiting and poor feeding. The majority of doctors in this study misidentified the appropriate common symptoms and signs. The NICE guideline places an emphasis on recording the presence of risk factors for UTI and serious underlying pathology. In this study, when doctors were given a list of potential risk factors, they were not able to accurately identify the relevant risk factors for UTI. This demonstrates a high level of mal-diagnosis amongst doctors of the relevant risk factors for UTI and underlying pathology. When compared with existing similar literature, doctors in this study demonstrated an inferior knowledge of predisposing factors for UTI (16). Similar findings were obtained from Al-Gabasani study (8) as it has been reported that UTI in children is often not well recognized by general practitioners and this leads to under-diagnosis which thought to be responsible for a significant number of children developing end-stage renal failure.

As regard investigations necessary to diagnose UTI, participants failed to appoint the proper investigation tools. Correct answers were not passing 50% of them. This was disappointing greatly and should be reflected in recommendations. Collection of an appropriate urine sample is an important component of the accurate diagnosis of urinary tract infection in children. It remains a challenging process, especially in children who are not toilet trained.

Jadresic et al showed that the more general practitioners send urine samples from children, the higher the diagnostic rate in that practice and this was deviated from our finding (17). The NICE guideline suggests that general practitioners advise parents to collect a clean catch sample where possible. This recommendation is mainly based on a systematic review which identified five studies that compared the diagnostic accuracy of clean catch urine samples with that of urine samples obtained by supra-pubic aspirate (SPA) (18). In general, the diagnostic accuracy of the clean catch samples was comparable to that of the SPA samples. The NICE guideline reports insufficient evidence to recommend a preference for the use of pads or bags. It is noted, however, that pads are considerably less expensive, and, based on cost considerations, their use is recommended in the guideline. It has been shown also that parents find pads easier to use and more convenient than urine collection bags (19).

Less than 60% of participants chose urine dipstick as marker for diagnosis in patients with UTI. In Al-Gabasani study (8), the majority of the physicians reported that they use a urinary dipstick, if they suspect urinary tract infection in children aged less than 36 months. There is a considerable risk of missing a proportion of cases of acute UTI in infants and children younger than three years when using dipstick testing, as frequent bladder emptying leads to a lack of urinary nitrite (20). The NICE guidelines recommend the use of dipstick testing only in the case of children over the age of three years. The diagnostic accuracy of leukocyte esterase and nitrite dipsticks is much lower in younger children (19).

It is most interesting that 81% of doctors in this study indicated that they would use a urinary dipstick to help diagnose a UTI in two-year-old children. This may represent a situation where it is not feasible to give practical effect to evidence based guidelines, because there is no other test for UTI that provides immediate results unless doctors can carry out or access microscopy. This is acknowledged in the guidelines, with a suggestion that a urinary dipstick could be used for a relatively well child under the age of three years, with non-specific symptoms, provided the test is backed up by non-urgent microscopy (13, 19).

This study demonstrates a clear variation in practice, amongst doctors working in primary care, with regard to investigation and specialist referral of children with UTI. In general the NICE guidelines recommend against detailed investigation and specialist referral of children with their first diagnosis of UTI, who respond well to treatment within 48 hours and have no atypical features. According to NICE, gender is no longer a major factor

in influencing the decision to refer or investigate children with UTI. (14)

Suprapubic catheterization was done 'always' and 'sometimes' by 20% of participants While in Al-Gabasani study (8), 40% of the physicians reported that they perform supra-pubic aspiration in an infant < 3 months with suspected UTI rarely whereas 71% routinely used catheter to collect urine from an infant <3 months old. Its choice was more than 'rarely' choice. Suprapubic catheterization should be reserved for selected cases only.

Despite the high percentage of participants who responded correctly to the type of antibiotics, about 48% of them chose the wrong route to administer them. In this study, co-amoxiclav was the antibiotic not commonly prescribed, by our participants for the 'blind' treatment of UTI in children. This is consistent with the results of a large Dutch family practice cohort study (21). In our study, Amoxicillin - clavulanic acid was the most common antibiotic recorded (30%), while in Al-Gabasani (2015), Cefixime was the first choice antibiotic mentioned by almost one-quarter of the physicians. Three randomized control trials which

compared the effectiveness of different oral antibiotics in lower UTI in children reported no significant difference between treatments (22-24). NICE do not recommend a specific antibiotic for 'blind' treatment, but instead suggest that the choice should be based upon locally developed multidisciplinary guidance. It is suggested that an antibiotic with low resistance patterns, such as a cephalosporin or co-amoxiclav, should be used when treating an upper urinary tract infection with oral antibiotics. It is also suggested that trimethoprim, nitrofurantoin, cephalosporin or amoxicillin may be suitable for the treatment of lower urinary tract infection (cystitis) (14, 21).

Even the period of time was variable among participants for a lower UTI in a six-year-old child as shown above. In Al-Gabasani study (8), about two-thirds of the physicians reported that they treated a child aged between one and 36 months with febrile UTI with antibiotics for 10 days whereas only 12% treated those with afebrile UTI for 3-5 days. A Cochrane review which included 10 randomized control trials comparing short (2-4 days) with standard (7-14 days) duration of oral antibiotic is quoted in the NICE guideline. There was no significant difference between the two groups to justify the longer duration of therapy (25). NICE clearly recommends treatment with oral antibiotics for three days for children aged over three months with lower UTI. It also recommends that parents and carers should be advised to bring the child back to the general practitioner for reassessment if the child is still unwell after 24-48 hours (25). The clear explanation of this phenomena is that absent of courses about UTI management is strongly associated with level of knowledge gained. The wide variation in the practice of general practitioners reported in this study is in keeping with the findings of similar studies in other countries (21, 26).

## 5 CONCLUSION

Level of knowledge is between weak and average despite variety of specialities and board certified. Whatever the size of pediatric group diseased with UTI, family physician should be aware of the NICE last updated guideline of treatment.

## 6 RECOMMENDATIONS

1. Establishment of courses for treatment of UTI in pediatric age group for Primary Health Care's physicians.
2. Annual audit about level of knowledge in pediatric specific diseases

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