

# A Symptomatic Urinary Tract Infection Among Kirkuk Technical Institute Students Attending Primary Health Center

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## Abstract

**Background:** Urinary tract infection is regarded as one of the most common health problem affecting female in all age groups.

**Objective:** To study the presences of a symptomatic urinary tract infection among female students attending primary health center belongs to Kirkuk Technical Institute.

**Patients and Methods:** Across- sectional study was done and a randomly selected sample (80 female students) from different scientific depts. in Kirkuk Technical Institute after receiving their agreements to participate in the study which was started from 1<sup>st</sup> December 2015 till 1<sup>st</sup> April 2016. A special questionnaire sheet prepared for this purpose. A general urine exam was done for each student and for the infected females, urine culture and sensitivity was performed.

**Results:** The results show that 80 female students were included in the study, 86.6 % of them aged (18- 20) years and there was a highly significant relationship between the age group < 18 years and the presence of infection with a p value = 0.000. More than half of infected female students (65.4%) having bacteria(bacteriuria) while 15.4% having pus cell (pyuria) and 80.8% of them having positive urine culture which was related to the presence of *Escherichia coli* (71.5%) .

**Conclusion:** *Escherichia coli* was the frequent bacteria among positive growth in infected females.

**Key words:** Female students, urinary tract infection, Kirkuk, Primary center.

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## Introduction

Urinary tract infection (UTI) is a medical term used commonly to describe a large number of clinical conditions including a symptomatic urinary tract infection which mean the presences of bacteria in the urine without any apparent signs and symptoms [1].

A symptomatic urinary tract infection (AUTI) is defined as serious health problem affecting large numbers of people each year [2].

Urinary tract is mainly infected by bacterial, fungal and sometimes viral infection [3]. The bacteria that causing urinary tract infection were entered to the bladder via the urethra or through blood stream or by lymphatic way. It is reported that bacteria are transmitted from the bowel to the urethra and in females due to their anatomical structure; the risk of infection is greater than men. After the bacterial entrance to the bladder *E coli* and other bacteria are detached to the bladder wall and forming a

biofilm that resisting immune response mechanism in the body [4].

Symptoms of urinary tract infection including fever and renal pain with dysurea in some cases [5]. Most women have recurrent infection within one year [3] and bacterial are the commonest in them [6] occurring between the age (16- 36) years and 40- 60% of them having infection at some points in their lives [4][7].

It is estimated that *Escherichia coli* is the most frequently microorganism causing uncomplicated urinary tract infection (75- 90%) [8], while (5-15%) of infection due to *Staphylococcus saprophyticus* which is mainly occurs in young women [9]. Other bacteria and gram negative rods like *Proteus mirabilis* and *klebsiella pneumonia* can be determined in some cases of urinary tract infection [10].

Women are more prone for urinary tract infection than men; these are due to short and close urethra to the anus [11]. A symptomatic bacteriuria increased with advancing ages from 2-7% in child bearing age women to 50% in elderly women working in care homes [11].

Women who have bacteria in their urine examination but without detectable signs and symptoms should not be treated with antibiotics [12]. Unless in these following cases, old women, spinal cord injury and women with urinary catheterization [13][14].

This study aims to determine the frequency of a symptomatic urinary tract infection among female students attending primary health center belongs to Kirkuk Technical Institute due to the presence of wide range of infection among those groups of age.

## Materials and Methods

This study was a descriptive cross-section carried out in primary health center which belongs to Kirkuk technical institute during the period from 1<sup>st</sup> December 2015 till the 1<sup>st</sup> of April 2016 .

A special questionnaire has been prepared by the investigator utilizing available related literature to the questionnaire item included the main demographic characteristics like (age, scientific dept., stage, residence, marital status).

The questionnaire form was distributed to female students after receiving the written consent from them and the data was collected by interviewing with the study students after complete explanation of the study aim .

The study was done among (80 female students) from different departments attending primary health center for many reasons like (seeking a medicine, laboratory investigation and for referral to hospital) . Urine analysis was done by microscopically and general urine examination as well as urine culture and sensitivity.

The microscopically and general urine examination a specimen of 5 ml clean catch mid- stream urine (MSU) was collected in a sterile bottle from each participant female students . The samples were labeled and then transferred to the laboratory within one hour to prevent infection and general urine examination (GUE) was done to them by centrifuging the urine at 2500 revolution / minute for 5 minutes and the supernatant was gently poured off by adding a drop of urine sediment on a clean slide which is covered with cover slip, then the slide was examined under the power of X10, X40objectives in order to detect any pus and red blood cells. In order to detect the presences of protein, nitrites, red blood cells and leukocytes esterase, and urine dipstick was done using COMB19 test strips.

The infected female students were referred to Kirkuk general hospital and plates of blood agar and MacConcky agar were aseptically inoculated because of the currently and widely used method in the hospital, then about 2-3 drops of precipitating urine and lastly incubated for

24- 48 hours. Pathogens like *Escherichia coli*, *Staphylococcus aureus*, *Proteus mirabilis* and *Pseudomonas aeruginosa* were identified by using Cowan and Steel method [15]. Which was done by inoculated 0.001 ml of aliquot urine into chocolate agar and cysteine lactose electrolyte deficient agar (CLED) which is incubated under aerobic conditions for 35C / 24 hours. Sample with more than  $10^5$  CFU / ml of the urine colony forming unit/ml was regarded a significant result [16].

### Statistical analysis

The data was analyzed by using: the questions with yes and no answer, number and percent will be calculated. The statistical test for this study was Chi- square in order to detect the relation among the studied variables and ( $P < 0.05$ ) was the level of significance.

### Result

Table 1 show that 86.6 % of study female students aging between (18-20) years, 66.3% from second stage, 90.0% of them not married, 50.0 % from administrative department, and 76.2% were living inside Kirkuk city.

**Table (1):** Socio demographic characteristics of the study female students.

Socio- demographic parameter		Study students N=80	
		No,	%
Age (years )	<18	2	2.2
	18-20	69	86.6
	>20	9	11.2
Educational stage	First stage	27	33.7
	Second stage	53	66.3
Marital status	Not married	72	90.0
	Married	8	10.0
Scientific department	Administrative	40	50.0
	Technical	28	35.0
	Health	12	15.0
Residence	Inside Kirkuk city	61	76.2
	Outside Kirkuk city	19	23.8

There was a highly significant relationship between the age group < 18 years and the presence of infection with a p value = 0.000. On the other hand there was

no significant relation between the infection and the age group 18- 20 years and > 20 years with a p value = 0.018 and 0.020 respectively as shown in table 2.

**Table (2):** Frequency distribution of study female students according to their age groups.

Age groups (years )	Non-infected female students N=54		Infected female students N=26		Total students N=80		*P value
	Number	%	Number	%	Number	%	
<18	1	1.1	1	3.8	2	2.5	0.000 HS
18-20	50	92.4	19	73.1	69	86.2	0.018 NS
>20	3	5.5	6	23.1	9	11.3	0.020 NS

Prevalence rate = 32.5,  $\chi^2$  - test was used , HS- highly significant , NS-not significant

The study presents that more than half of infected female students (65.4%)

having bacteria(bacteriuria) while 15.4% having pus cell (pyuria) as in table 3.

**Table (3):** Frequency distribution of study students according to items of urinalysis.

Items of urinalysis	Infected female students N=26	
	Number	%
<b>Bacteria</b>	17	65.4
<b>Pus cells</b>	4	15.4
<b>Crystals</b>	2	7.7
<b>Protein</b>	2	7.7
<b>Red blood cells</b>	1	3.8
<b>Total</b>	26	100.0

The results of the current study revealed that out of the total [ 26] infected female students, 80.8% of them having positive

urine culture while 19.2 % having negative culture as in table 4.

**Table (4):** Frequency distribution of study students according to the results of urine culture and sensitivity.

Results of urine culture and sensitivity	Number	%
<b>+ ve culture</b>	21	80.8
<b>-ve culture</b>	5	19.2
<b>Total</b>	26	100.0

Majority of the positive growth were related to were related to Escherichia coli , [71.5%] while Staphylococcus aureus, Proteus mirabilis and

Pseudomonas aeruginosa shared by less percent as follow ( 14.3%, 9.5%, and 4.7%) respectively as in table 5.

**Table (5):** Frequency distribution of study students according to the type of bacteria.

Type of bacteria	Number	%
<i>Escherichia coli</i>	15	71.5
<i>Staphylococcus aureus</i>	3	14.3
<i>Proteus mirabilis</i>	2	9.5
<i>Pseudomonas aeruginosa</i>	1	4.7
<b>Total</b>	21	100.0

## Discussion

Regarding table 1 which presents the demographic distribution of the study sample, it show that most of female students between the age group of 18- 20 years and this result was not go with a study done by Ojo and Anibijuwon in 2010[17]. They conducted a study at University of Ado-Ekiti among female students and they reported that regarding the demographic distribution, there

was a high percent of urinary tract infection among the age group between 21-25 years and 26-30 years.

They explained that the main causes may be due to indiscriminate antibiotic taken by the students because some of them refused non- prescribed antibiotics usage whatever the difficulty in urination is noticed. They also mentioned that most of urinary tract infection cases were asymptomatic except

some of them and the majority of students don't complain of lower abdominal pain or any burning sensation but they have a significant bacteria in their urine due to fecal contamination and the predilection of the bacteria from the toilet.

Table 2 revealed that most of female students who show a high percent of bacteria in their urine were among the age group (18-20) years and this because of in proper use of the bath room and unclean state of sanitary environment in the Institute, in addition to careless and dirty habits among female students. This result was disagree with a similar study conducted by Chijioke *et al* in 2016 who found of asymptomatic bacteriuria among female students in a tertiary institution/ south Imo Nigeria Imo State University Owerri (IMSU) and they found that the high percent of bacteria present among the age group (20-22) years and the overall prevalence rate of was (13.8%) [18]. they further mentioned that a symptomatic urinary tract infection more commonly occurs and it is regarded the important cause for infection because of under certain conditions, the bacteria which colonize and grow in the urinary system ascending to the bladder causing (Cystitis) and this clinical condition is associated with a classical signs and symptoms like renal pain, difficult urination and urgency.

The current study show the presences of bacteria in the urine of the study female students without any obvious signs or symptoms and this is due to that urinary tract infection can be present in different forms depending on the age of the infected person and the part of urinary tract infected, but generally most female students are usually untreated these infection because of absences of any detectable symptoms. This result is agreed with a study done by Frank *et al* [19]. In Port Harcourt demonstration secondary

school in Nigra to detect the presences of asymptomatic bacteriuria among University students. They found that there was a high rate of urinary tract infection among them and they related these results due to damaged toilet and bathrooms and inappropriate usage of these toilet could result to infection. They reported that the urine of the female is ejected with strong force that creates a great splashes which further reintroduce the pathogenic organisms from the outside into their urinary systems.

The existing study show that majority of infected female students presents a positive urine culture and this finding go with a study done by Amali *et al* [20]. Among female students in the university of Agriculture – Makurdi- Nigeria in order to examined the presence of pathogenic organisms in their urine and they found that 204 (95.7%) of them show a positive urine culture and they explained these results due to proximity of the vagina near the anus from where the microorganisms can be readily entered to their urethra during urination.

Concerning the microorganism present in the infected urine, the study revealed that *Escherichia coli* was the prevalent type of bacteria among female students because of a short urethra leading to easily reaching of *Escherichia coli* to the bladder and this result was agree with a similar study conducted by Mwaka [21]. In Uganda to assess the presences of urinary tract infection among non- pregnant women attending Mulago hospital. He found that majority of infected women show a positive urine culture due to presence of *Escherichia coli* in their urine and he explained this finding by the haematogenous ascending infection.

*Staphylococcus aureus* was the second causative organism in this study.

Dembry *et al* [22]. stated in his book that *Staphylococcus aureus* is the 2nd common

cause of urinary tract infection in young women while *Pseudomonas aeruginosa* are present but in little amount. They mentioned that urinary tract infection are the most widely spread infection which is usually seen in hospitals and it is regarded the second commonest infection which is seen in highest population.

*Proteus mirabilis* and *Pseudomonas aeruginosa* bacteria constitute a little percent in the current study and this finding is not go with a study done by Kothari *et al* [23]. in India to assess the prevalence of urinary tract infection and they mentioned that *proteus sp.* has a significant association with urinary tract infection because of its active motility and swarming ability in comparison with the other types of bacteria.

In conclusions, the study concluded that half of infected female students having bacteria(bacteriuria), about two third of female students having positive urine culture, and the most common organism for urinary tract infection is related to *Escherichia coli*.

The study recommended that regular health surveillance is an important measure for the maintenance of good health to all community and advanced expanded studies on a large population like university female student with essential antibiotics treatment which must be provided for every infected students to prevent further spread of infection and a symptomatic bacteriuria can be assessed by continuous checking of the urine through general urine test as a part of medical examination to all university students.

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