

# Evaluation of Nurses' Practices Towards Caring of Children with Urinary Tract Infection

<sup>1 a)</sup> Hajar Haider Sadoon, <sup>2 a)</sup> Assis Prof.Dr. Zaid Waheed Ajil

<sup>1</sup>Academic Nurse working at University of Al-Qadisiyah /College of Nursing

<sup>2</sup>Working at University of Baghdad/College of Nursing, pediatric Nursing Department

<sup>a)</sup> hajar. haider@qu.edu.iq, <sup>b)</sup> zaid\_ahjil@conursing.uobaghdad.edu.iq

## Abstract

**Background:** Urinary tract infection (UTI) is among the most common bacterial illnesses seen by pediatricians". "Diagnosis and management of acute and recurrent urinary tract infections in children remain contentious. The classification of urinary tract infections (UTIs) into three groups, febrile upper UTI acute pyelonephritis, lower UTI cystitis, and asymptomatic bacteriuria. A urinary tract infection is clinically diagnosed based on< symptoms and verified bacterial <growth in the urine. The nurse plays a critical role in halting the transmission of infection. She can achieve this by applying suitable infection control methods to limit the transmission of germs and by breaking or blocking the transfer of infection from one chain link to the next.

**Objectives:** To "evaluate the level of nurses ' practices about care of children with urinary tract infection, to reduce urinary tract infection and to determine the relationship between nurses' practices and their demographic data characteristic.

**Methodology:** A quasi-experimental design (control and study group) has been carried out at al-Diwaniyah Pediatric and Maternity Teaching Hospital in al-Diwaniyah City from 14th September 2022 to 23th April 2023and a probability (Random) sample of (50) nurses who have been actually working in the Diwaniyah Pediatric and Maternity Teaching Hospital .those nurses are divided into two groups, study and control groups, each group consisted of (25) nurses.

To evaluate nursing staffs' practice about Care of Children with urinary tract Infections through the use of practice checklist includes (11) nursing roles to prevent UTIs among Children. Reliability of instrument was determined through the use of Cronbach's alpha approach and the instrument validity was determined through a panel of (14) experts.

**Results:** the results showed a positive effectiveness of educational program. It also shows that there are highly significant differences in the study group between pre and post-tests at significance level  $P \leq 0.05$ .

**Conclusion:** the study concluded that the nurses working at Diwaniyah Pediatric and Maternity Teaching Hospital have the minimum level of experience in urinary tract Infections control and need educational program and sessions.

**Recommendations:** the study recommended that training and teaching all the nursing team regardless of their work place to minimize or control on urinary tract infection and using pictures and educational booklets concerning UTI control in different sections..

**Key words:** nursing; evaluation, urinary tract infection, practices, children

## Introduction

Urinary tract infections are a common health problem among children (UTIs). The early diagnosis and treatment of this illness are absolutely necessary in order to bring down the overall mortality rate (Simoes e Silva & Oliveira, 2015).

Urinary tract infection (also known as UTI) is the bacterial disease that affects children more than any

other type in the globe, and it can have particularly catastrophic consequences on younger children. The most recent information on the diagnosis> and treatment of community-acquired UTI >in babies and children older than 90 days but less than 14 years may be found in this guideline ( Albarak et al.,2021).

After middle ear infections, "urinary tract infections (UTIs) >are the second most prevalent kind of

bacterial infection that affects children". "It is estimated that 3–7% of girls and 1–2% of boys in the United States will be diagnosed with a urinary tract infection (UTI) by the age of 6, and 12–30% of these children will experience recurrent UTI". These estimates are [based on the cumulative incidence of urinary tract infections (UTIs) in children (Teshager et al., 2022)].

UTIs are [equally common in boys and girls during the first year of life, but they become more common in girls after that]. "The classification of urinary tract infections (UTIs) into three groups, febrile upper UTI acute pyelonephritis, lower UTI cystitis, and asymptomatic bacteriuria, is beneficial for a number of reasons, the most important of which is that it facilitates an understanding of the disease's pathophysiology". "A virulent strain of *E. coli* is the most common cause of a single episode of febrile UTI, but urinary tract anomalies or bladder failure are the most common causes of recurrent infections and asymptomatic bacteriuria (Boon et al., 2022).

A urinary tract infection is clinically diagnosed based on symptoms and verified bacterial growth in the urine. Often, further urine abnormalities, such as leucocyturia and a positive nitrite test, are used to confirm the diagnosis. "In the acute context, the absence of leukocytes in the urine can be used to rule out a urinary tract infection (UTI) if there are no other significant signs of a UTI; nonetheless, it is sensible to get a urine culture, as some children without leucocyturia may still have a UTI". To localise the infection, blood tests, especially for inflammatory markers, and nuclear imaging were conducted. Thus, more specific pyelonephritis indicators are required (Tullus & Shaikh, 2020).

## Methodology

A quasi-experimental design (control and study group) has been carried out at al-Diwaniyah Pediatric and Maternity Teaching Hospital in al-Diwaniyah City from 14th September 2022 to 23th April 2023 and a probability (Random) sample of (50) nurses who have been actually working in the Diwaniyah Pediatric and Maternity Teaching Hospital. Those nurses are divided into two groups, study and control groups, each group consisted of (25) nurses. One group did not expose to the program was considered as the "control group". The other twenty five nurses who were participated to the program, considered as the "study group".

To accomplish the study, a skills checklist is used the content of the format based on the review of related literature and subjective experiences of the skills

checklist of the researcher. The checklist is consisting of (2) parts: part 1 includes self-administrated sheet related to the demographic characteristics of the nurses (age, gender, educational level, marital status, and years of experiences.). Part 2 includes a 11 nursing roles to prevent UTIs among Children to evaluate nursing staffs' practice about Care of Children with urinary tract Infections. Items are rated according to the Likers' scale; always (2); sometimes (1); never (0), the level of scale which is scored as a total of three episodes of events is observed for each respondent [Three correct practices out of three episodes are rated as always; 2-1 correct practices out of (3) episodes are rated as sometimes and uncorrected practices are rated as never]. Data were collected through direct observation and each observation take 20-25 minute.

The educational program about UTI among children is designed and presented in (five) lectures throughout the seven-day period. Every lecture took approximately 45 minute and the number of staff attended (50) nurses in the classroom in AL Diwaniyah Pediatric and Maternity Teaching Hospital.

Validity of the program and the study instruments (practice checklist) are determined by the panel of (14) experts with a combined total of at least 17 years of expertise in their respective fields.

The study instrument's reliability was examined using the Cronbach's alpha approach and "the Statistical Package for Social Science Program (SPSS) version 22.0. It was determined by assessing (5) nurse in Al Diwaniyah Pediatric and Maternity Teaching Hospital using a test-and-retest procedure".

"The reliability result shows that Cronbach's Alpha" was ( $r = [0.90]$  about Knowledge about practice section and  $r = [0.84]$ , "which is considered an acceptable statistical match with the lowest level Limited by the reliability factor".

## Results

**Table 1** Distribution of the Participants Including Study and Control Groups According to Demographic Characteristics

| Demographic Characteristics | Variables          | Control Group<br>(n=25) |       | Study Group<br>(n=25) |       |
|-----------------------------|--------------------|-------------------------|-------|-----------------------|-------|
|                             |                    | f.                      | %     | f.                    | %     |
| Age                         | < 26 years         | 11                      | 44.0  | 15                    | 60.0  |
|                             | 26- 30 years       | 13                      | 52.0  | 8                     | 32.0  |
|                             | 31-35 years        | 0                       | 0     | 1                     | 4.0   |
|                             | ≥ 36 years         | 1                       | 4.0   | 1                     | 4.0   |
|                             | Total              | 25                      | 100.0 | 25                    | 100.0 |
|                             | Mean ± SD          | 26.20 ± 4.082           |       | 26.36 ± 3.967         |       |
|                             | Min - Max          | 21 – 44 years           |       | 21 – 40 years         |       |
| Gender                      | Male               | 8                       | 32.0  | 10                    | 40.0  |
|                             | Female             | 17                      | 68.0  | 15                    | 60.0  |
|                             | Total              | 25                      | 100.0 | 25                    | 100.0 |
| Marital status              | Single             | 16                      | 64.0  | 18                    | 72.0  |
|                             | Married            | 8                       | 32.0  | 7                     | 28.0  |
|                             | Widow              | 0                       | 0     | 0                     | 0     |
|                             | Divorce            | 1                       | 4.0   | 0                     | 0     |
|                             | Total              | 25                      | 100.0 | 25                    | 100.0 |
| Education level             | Cycle in nursing   | 1                       | 4.0   | 1                     | 4.0   |
|                             | Secondary school   | 2                       | 8.0   | 2                     | 8.0   |
|                             | Institute          | 5                       | 20.0  | 5                     | 20.0  |
|                             | College            | 15                      | 60.0  | 15                    | 60.0  |
|                             | High certificate   | 2                       | 8.0   | 2                     | 8.0   |
|                             | Total              | 25                      | 100.0 | 25                    | 100.0 |
| Years of experience         | Less than 5 years  | 22                      | 88.0  | 20                    | 80.0  |
|                             | 5-10 years         | 3                       | 12.0  | 5                     | 20.0  |
|                             | 11- 15 years       | 0                       | 0     | 0                     | 0     |
|                             | More than 15 years | 0                       | 0     | 0                     | 0     |
|                             | Total              | 25                      | 100.0 | 25                    | 100.0 |

f.: Frequency, No.: Number, %Percentage, M = Mean of score, S.D=Standard Deviation, Min, minimum, Max= maximum and N.S = Non significant at  $p > 0.05$ .

Table (1) showed that the age of the participants (n= 50 for two groups) was at most from 26- 30 years old (52%) in control group with mean 26.20 years while less than 26 years at most (60%) in study group with mean 26.36 years. According to gender, the female was a more than male in the two groups (60% in control and 68% in study groups respectively).

Regarding the educational level in the two groups at most (60%) complete college. The results also showed the most of participants were singles (64% in control and 72% in study group). Regarding the years of experience of the participants at most less than 5 years (88% in control group and 80% in study group) as accounted for study and control group respectively.

**Table 2:** Evaluation of the nurses practices about care of children with urinary tract infection in control and study groups

| Items   | Gro<br>up | Pre            |               |                 |          |          |         | Post           |               |                 |          |          |         |
|---|-----------|----------------|---------------|-----------------|----------|----------|---------|----------------|---------------|-----------------|----------|----------|---------|
|   |           | Ne<br>ver<br>% | So<br>me<br>% | alwa<br>ys<br>% | Me<br>an | SD       | E<br>v. | Nev<br>er<br>% | So<br>me<br>% | alwa<br>ys<br>% | Me<br>an | SD       | E<br>v. |
| 1. Giving antipyretics  | Con.      | 0              | 4             | 96              | 1.9<br>6 | .20<br>0 | H       | 0              | 4             | 96              | 1.9<br>6 | .20<br>0 | H       |
|   | Stud      | 0              | 0             | 100             | 2.0<br>0 | .00<br>0 | H       | 0              | 0             | 100             | 2.0<br>0 | .00<br>0 | H       |
| 2. Assess the patient's vital signs every 4 hours   | Con.      | 0              | 60            | 40              | .40      | .50<br>0 | L       | 56             | 44            | 0               | .44      | .50<br>7 | L       |
|   | Stud      | 72             | 28            | 0               | .28      | .45<br>8 | L       | 0              | 48            | 52              | 1.5<br>2 | .51<br>0 | H       |
| 3. Giving the fluids prescribed by the doctor according to the age, weight and needs          | Con.      | 0              | 4             | 96              | 1.9<br>6 | .20<br>0 | H       | 0              | 8             | 92              | 1.9<br>2 | .27<br>7 | H       |
|   | Stud      | 0              | 8             | 92              | 1.9<br>2 | .27<br>7 | H       | 0              | 0             | 100             | 2.0<br>0 | .00<br>0 | H       |
| 4. Accurate documentation of fluids entering and leaving the body                             | Con.      | 0              | 24            | 76              | 1.7<br>6 | .43<br>6 | H       | 0              | 24            | 76              | 1.7<br>6 | .43<br>6 | H       |
|   | Stud      | 0              | 44            | 56              | 1.5<br>6 | .50<br>7 | H       | 0              | 12            | 88              | 1.8<br>8 | .33<br>2 | H       |
| 5. Giving the appropriate antibiotic prescribed by the doctor according to the age and weight | Con.      | 0              | 0             | 100             | 2.0<br>0 | .00<br>0 | H       | 0              | 0             | 100             | 2.0<br>0 | .00<br>0 | H       |
|   | Stud      | 0              | 0             | 100             | 2.0<br>0 | .00<br>0 | H       | 0              | 0             | 100             | 2.0<br>0 | .00<br>0 | H       |
| 6. Clean from front to back when changing diapers using wet wipes free of alcohol             | Con.      | 84             | 8             | 8               | .24      | .59<br>7 | L       | 76             | 16            | 8               | .32      | .62<br>7 | L       |
|   | Stud      | 72             | 20            | 8               | .36      | .63<br>8 | L       | 0              | 28            | 72              | 1.7<br>2 | .45<br>8 | H       |
| 7. Washing and sterilizing hands before and after inserting the urinary catheter              | Con.      | 84             | 12            | 4               | .20      | .50<br>0 | L       | 88             | 8             | 4               | .16      | .47<br>3 | L       |
|   | Stud      | 80             | 16            | 4               | .24      | .52<br>3 | L       | 0              | 32            | 68              | 1.6<br>8 | .47<br>6 | H       |
| 8. Use sterile gloves before and after inserting the urinary catheter                         | Con.      | 0              | 4             | 96              | 1.9<br>6 | .20<br>0 | H       | 0              | 4             | 96              | 1.9<br>6 | .20<br>0 | H       |
|   | Stud      | 0              | 0             | 100             | 2.0<br>0 | .00<br>0 | H       | 0              | 0             | 100             | 2.0<br>0 | .00<br>0 | H       |

|   |       |    |    |     |     |     |   |    |    |     |     |     |   |
|---|-------|----|----|-----|-----|-----|---|----|----|-----|-----|-----|---|
|   | Stud  | 0  | 0  | 100 | 2.0 | .00 | H | 0  | 0  | 100 | 2.0 | .00 | H |
|   | .     |    |    |     | 0   | 0   |   |    |    |     | 0   | 0   |   |
| 9. Use local anesthesia before inserting the urinary catheter                   | Con.  | 0  | 0  | 100 | 2.0 | .00 | H | 0  | 0  | 100 | 2.0 | .00 | H |
|   |       |    |    |     | 0   | 0   |   |    |    |     | 0   | 0   |   |
|   | Stud  | 0  | 0  | 100 | 2.0 | .00 | H | 0  | 0  | 100 | 2.0 | .00 | H |
|   | .     |    |    |     | 0   | 0   |   |    |    |     | 0   | 0   |   |
| 10. Sterilize the area from front to back before inserting the urinary catheter | Con.  | 80 | 16 | 4   | .24 | .52 | L | 68 | 28 | 4   | .36 | .56 | L |
|   |       |    |    |     |     | 3   |   |    |    |     |     | 9   |   |
|   | Stud  | 72 | 24 | 4   | .32 | .55 | L | 0  | 36 | 64  | 1.6 | .49 | H |
|   | .     |    |    |     |     | 7   |   |    |    |     | 4   | 0   |   |
| 11. Emptying the urine collection bag regularly                                 | Con.  | 0  | 48 | 52  | 1.5 | .51 | H | 0  | 48 | 52  | 1.5 | .51 | H |
|   |       |    |    |     | 2   | 0   |   |    |    |     | 2   | 0   |   |
|   | Stud  | 0  | 56 | 44  | 1.4 | .50 | H | 0  | 12 | 88  | 1.8 | .33 | H |
|   | .     |    |    |     | 4   | 7   |   |    |    |     | 8   | 2   |   |
| Overall nurses practices about care of children with UTI                        | Con.  |    |    |     | 1.2 | .17 | F |    |    |     | 1.3 | .18 | F |
|   | Stud. |    |    |     | 9   | 9   |   |    |    |     | 1   | 6   |   |
|   |       |    |    |     | 1.2 | .23 | F |    |    |     | 1.8 | .12 | H |
|   |       |    |    |     | 8   | 7   |   |    |    |     | 5   | 8   |   |

M = Mean of score, S.D=Standard Deviation, Eva=evaluation level, L = Low (0 – 0.66), F= Fair (0.67- 1.33), H = High (1.34 - 2).

Table 2 showed the evaluation of the nurses' practices about care of children with urinary tract infection in control group were fair in pre (1.29) and post (1.31) while in study group fair just in pre (1.28) and high in post (1.85).

**Table 3:** Association between nurses demographics with their knowledge and practices about care of children with urinary tract infection in study group post - test

| Demographic Characteristics | Variables        | Knowledge |      |          |          | Practices |      |          |          |
|-----------------------------|------------------|-----------|------|----------|----------|-----------|------|----------|----------|
|                             |                  | Mean      | SD   | Analysis | p. value | Mean      | SD   | Analysis | p. value |
| Age                         | < 26 years       | 1.71      | .202 | Cc=380   | .061     | 1.85      | .112 | Cc=.150  | .473     |
|                             | 26- 30 years     | 1.79      | .181 |          |          | 1.83      | .164 |          |          |
|                             | 31-35 years      | 2.00      | .    |          |          | 2.00      | .    |          |          |
|                             | ≥ 36 years       | 1.94      | .    |          |          | 1.82      | .    |          |          |
| Gender                      | Male             | 1.73      | .233 | F=2.411  | .652     | 1.85      | .137 | F=.120   | .822     |
|                             | Female           | 1.77      | .175 |          |          | 1.84      | .126 |          |          |
| Marital status              | Single           | 1.73      | .193 | F=1.079  | .310     | 1.84      | .132 | F=.056   | .816     |
|                             | Married          | 1.82      | .206 |          |          | 1.86      | .127 |          |          |
|                             | Widow            | .         | .    |          |          | .         | .    |          |          |
|                             | Divorce          | .         | .    |          |          | .         | .    |          |          |
| Education level             | Cycle in nursing | 1.44      | .    | F=1.002  | .043     | 1.62      | .    | F=1.013  | .048     |
|                             | Secondary school | 1.67      | .316 |          |          | 1.70      | .000 |          |          |

|                            |                    |      |      |         |      |      |      |         |      |
|----------------------------|--------------------|------|------|---------|------|------|------|---------|------|
|                            | Institute          | 1.79 | .229 |         |      | 1.84 | .050 |         |      |
|                            | College            | 1.94 | .176 |         |      | 1.87 | .148 |         |      |
|                            | High certificate   | 2.00 | .000 |         |      | 2.00 | .000 |         |      |
| <b>Years of experience</b> | Less than 5 years  | 1.73 | .197 | F=1.978 | .173 | 1.83 | .133 | F=1.492 | .234 |
|                            | 5-10 years         | 1.87 | .172 |         |      | 1.91 | .091 |         |      |
|                            | 11- 15 years       | .    | .    |         |      | .    | .    |         |      |
|                            | More than 15 years | .    | .    |         |      | .    | .    |         |      |

**P=probability value, NS: Non-Significant at  $P > 0.05$ , S: Significant at  $P < 0.05$ , HS: Highly Significant at  $P < 0.01$ .**

In table 5 the results showed there was no significant statistical correlation between nurses age with their knowledge and practices about care of children with urinary tract infection in study group post - test at  $P > 0.05$ . Also the results showed there were significant statistical differences between nurses level of education with their knowledge and practices about care of children with urinary tract infection in study group post - test at  $P < 0.05$ .

### Discussion

Throughout the data analysis of the present study, **Table (1)** showed the results of the statistical distribution of the nurses' sociodemographic characteristics. The study findings demonstrated that the age of the participants ( $n= 50$  for two groups) was at most from 26- 30 years old (52%) in control group with mean 26.20 years while less than 26 years at most (60%) in study group with mean 26.36 years. The study result is consistent with the study (Devrim et al., 2022), which found The average age of participants was 24 to 30 years in 79 (89.8%).

According researcher believe that nurses who work in critical units and workload units are considered to be in their middle ages ,this age range is deemed suitable because these units demand more activities and require higher level of focus .furthermore ,this viewpoint is reinforced by (Dawood & Hassan, 2018).

According to gender, the female was a more than male in the two groups (68% in control and 60%in study groups respectively). Consistently, this finding is "confirmed by a study that found that more than half (62%) of the study sample were females (Hattab et al., 2021).

The researcher believes that this result is gives as the nurses job is more likely for the female than male and this job it is established on female gender.

In table (1), considering the educational level of the two groups, the majority (60%) hold a bachelor's degree, In addition, (Alshahrani et al., 2022) revealed that 71.3% of participants held a bachelor's degree, 15.8% held an associate's degree, and 11.1% held a postgraduate degree. In addition, additional research corroborated the sociodemographic features of the examined pediatric nurses; the mean age of the researched nurses was  $29.16 \pm 5.51$  years. "Regarding gender, 92.9% of the examined nurses were females, although the study was inconsistent with the findings of this research in that more than half (57.1%) of the researched nurses had a nursing technical institute diploma while fewer than half (42.9%) had a bachelor's degree in nursing" (Elsayed, 2022; Obaid & Mohammed, 2020; Nasih & Ghafel, 2022). Researcher suggest that there is a global need to prioritize the development of nursing education. As part of this effort, there has been an increase in the number of nursing colleges in Iraq, resulting in a higher number of nursing graduates this opinion supported by (Waheed& Abdulwahhab, 2022).

In the table (1), concerning participants were singles (64% in control and 72% in study group). Regarding the years of experience of the participants at most less than 5 years (88% in control group and 80% in study group) as accounted for study and control group respectively. The study result is consistent with the study (Najm et al .,2020 ; Majeed et al.,2022 ), which found That the majority of them were single and less than 5 years from years' experience in the nursing field. "Other studies "were not confirmed by the current research findings That stated the majority of them were more than 5 years from years' experience" in the nursing field"( Jassm & Aziz, 2020).

According researcher opinion nursing job need more experiences and more practices especially critical units need more experts to reduce the risk of mistakes.

( **Table 2** ) In the table (4-5), the results show the evaluation of the nurses' practices about care of children with urinary tract infection in control group were fair in pre and post while in study group fair just in pre and high in post . A quasi-experimental study conducted in Egypt revealed that the level of nurses' CAUTI preventive measures in the PICU improved significantly following intervention. Consistent with other studies, this study found that the nurses' observed practices categories score regarding urinary catheter and Catheter-associated Urinary Tract Infection (CAUTI) prevention in Pediatric Intensive Care Unit (PICU) prior to and after intervention with evidence-based guidelines were comparable. This may be attributed to the adoption of CAUTI prevention, intervention with evidence-based recommendations for nurses, which led to an improvement in their level of practice (Elsayed, 2022). It is consistent with previous findings showing nurses had a solid understanding of CAUTI following program implementation (Sarani et al., 2015).

(**Table 3**): In the table (4), the results showed there was no significant statistical correlation between nurses' age with their knowledge and practices about care of children with urinary tract infection in study group post - test at  $P > 0.05$ . This result is in line with the study achieved by (Hussein et al., 2021), they showed no statistically significant relationship between nurses age with their knowledge and practices ( $P=0.051$ ). In comparison, other studies were not consistent with the current research findings that reported (Arunath et al., 2015); they found statistically significant correlations between mean of total knowledge score and age of the selected sample of nursing employees. In addition, This finding is not consistent with other study stated that the significant statistical differences were found between mean practice scores towards nurses age group that care of children with urinary tract infection in post - test at  $P > 0.05$  (Ayed, 2015). Also, other studies were not consistent with the current research findings that reported there is a significant relationship between knowledge and age ( $p>0.05$ ) (Sarani et al., 2015; Mahdi& Ahmed,2018).

According to researchers, the level of knowledge and practices without education is believed to remain unaffected by age.

Furthermore, these results showed there were significant statistical differences between nurses' level of education with their knowledge and practices about care of children with urinary tract infection in study group post - test at  $P < 0.05$ . This conclusion validated

the results of a research comparing the sample's mean knowledge scores to their level of education. It demonstrates that nurses with a bachelor's degree had higher average knowledge scores than those with a certificate and a diploma with a specialty (Almatrafi et al., 2022; Eskander et al., 2013; Obaid et al., 2016). Also This findings inconsistent with the study (Awad & Ajil, 2021).

The majority of nurses in the control group had fair pre- and post-test knowledge of the care of children with urinary tract infections, whereas the majority of nurses in the research group had fair pre-test knowledge and excellent post-test knowledge. Following exposure to an educational program on the treatment of urinary tract infections in children, the study group nurses' knowledge has increased. At the post-test, the considerable knowledge gaps between nurses in the study and control groups proved the program's effectiveness. This study shows the urgent need for training for the care of children with urinary tract infections due to the nurses' weak knowledge and practice about the prevention of urinary tract infections (Researcher).

#### Recommendations:

Based on the results of the current study recommends a continuing education program for all nursing staff in different levels in all Iraqi hospitals to reduce medication errors, patient risk of injury and enhance patient's safety.

#### References:

1. Albarrak Teo, T, C & Low, K,C (2016), 'The Impact of Goal Setting on Employee Effectiveness to Improve Organization Effectiveness: Empirical study of a High-Tech Company in Singapore', *Journal of Business & Economic Policy*, vol 3.no.1,pp.1-16.
2. Almatrafi, M. A., Sindi, L., Alshehri, M., Sendi, E., Sindi, G., Alzahrani, G., Alwan, J., Salawati, E., Alwafi, H., Minshaw, F., Mosalli, R., & Samannodi, M. (2022). Parental Knowledge and Awareness of Childhood Urinary Tract Infections: A Cross Sectional Survey. *Patient Preference and Adherence*, 16(September), 2423–2430.  
<https://doi.org/10.2147/PPA.S361313>
3. Alshahrani, M., Alzahrani, A. B. S., Alzahrani, A. A., Alqhtani, A. M. A., Alwabel, H. H., Asiri, K. M. M., Abumelha, Y. M., Alshahrani, R. S. H., Alshahrani, A. A. M., Alhussain, R. M. O., Al-Qahtani, K. M. S., Alqarni, A. A. O., Ayied,

- H. A. M., Zaqan, H. A. A., & Nasser, M. S. N. (2022).
4. Arunath, V., Gnanasekar, B., Coonghe, P. A. D., & Sathiadas, M. G. (2015). Knowledge attitude and practices related to childhood urinary tract infections among carers of patients with urinary tract infections—A single centre experience. *Proceedings of Annual Scientific Sessions of Faculty of Medical Sciences*.
5. Awad, M., & Ajil, Z. (2021). Effectiveness of an Educational Program on Nurses' knowledge about using Physiotherapy for Children with Pneumonia at Pediatric Hospitals in Babylon. *Kufa Journal for Nursing Sciences*, 11(2), 44-51.
6. Ayed, A. (2015). Knowledge and practice of nursing staff towards infection control measures in the Palestinian hospitals.
7. Boon Tullus, K., & Shaikh, N. (2020). Review Urinary tract infections in children. *The Lancet*, 395(10237), 1659–1668. [https://doi.org/10.1016/S0140-6736\(20\)30676-0](https://doi.org/10.1016/S0140-6736(20)30676-0)
8. Dawood, H. A., & Hassan, H. S. (2018). Effectiveness of Structured Educational Program on Nurses' Knowledge Concerning Therapeutic Communication at Cardiac Care Units in Holy Karbala Governorate Hospitals. *Indian Journal of Public Health Research & Development*, 9(8).
9. Devrim, F., Besin, D., Kantar Özşahin, A., Pehlivan Zorlu, B., Dur, Ö., Yılmaz, E., & Dincel, N. (2022). Evaluation of the Knowledge and Awareness Level of the Pediatric Residents About the Diagnosis, Treatment and Follow-up of Urinary Tract Infection in Children. *TRENDS IN PEDIATRICS*, 3(3), 86–89.
10. Elsayed, R. (2022). Effectiveness of Evidence-Based Guidelines on Catheter Associated Urinary Tract Infection Rate among Pediatric Intensive Care Children. *International Egyptian Journal of Nursing Sciences and Research*, 0(0), 0–0. <https://doi.org/10.21608/ejnsr.2021.97842.1100>
11. Eskander, H. G., Youssef, W., Morsy, M., Ali, H., & Elfeky, A. (2013). Intensive Care Nurses' Knowledge & Practices regarding Infection Control Standard Precautions at a Selected Egyptian Cancer Hospital. 4(19), 160–174.
12. Hattab, W. A. A., Kadhim, A. J., & Abdulwahhab, M. M. (2021). Impact of Years' Experience upon Nurses' Knowledge and Practice concerning Infection Control at Critical Care Units in Baghdad City. *Indian Journal of Forensic Medicine & Toxicology*, 15(1), 2564-2568.
13. Hussein, T. M., Al-Fattah, M. N., Thamir, T., & Ibrahim, R. H. (2021). Assessment of Nursing Students' Knowledge toward Preventive Measures of Urinary Tract Infections in Mosul Teaching Hospitals. Prof.(Dr) RK Sharma, 21(1), 1070.
14. Jassm, A., & Aziz, A. (2020). Effectiveness of Health Educational Program on Nurses' Knowledge toward Children Pneumonia in Al-Amara City Hospitals. *Iraqi National Journal of Nursing Specialties*, 33(1), 44-52.
15. Mahdi, Z. S., & Ahmed, S. A. (2018). Effectiveness of Aan Education Program on Nurses' Knowledge Toward Prevention of Orthopedic Wound Infection in Baghdad Teaching Hospitals. *Indian Journal of Public Health Research & Development*, 9(8).
16. Majeed, H. M., Hassan, A. F., & Abid, R. I. (2020). Evaluation of nurses' knowledge and attitudes toward pain management at Baghdad Teaching Hospitals. *Indian Journal of Forensic Medicine & Toxicology*, 14(2), 1574-1579.
17. Najm, M. A., Jassim, A. H., & Mohammed, T. R. (2020). Critical care nurses' knowledge about pulmonary embolism in respiratory care unit in Baghdad teaching hospitals. *Indian Journal of Forensic Medicine & Toxicology*, 14(3), 895-901.
18. Nasih, R. A., & Ghafel, H. H. (2022). Evaluation of Nurses' Practices about Urgent Care for Common Pediatric Cases at Emergency Ward. *resmilitaris*, 12(2), 6777-6784.
19. Obaid, B. K., Hussein, A., & Noori, K. A. (2016). Nurses' knowledge concerning neonatal sepsis in neonatal intensive care units at pediatric teaching hospitals in Baghdad city. *Asian academic research journal of multidisciplinary*, 3(7), 56-65.
20. Obaid, H., & Mohammed, S. (2020). Effectiveness of Educational Program on Nurses Knowledge toward Nursing Management for Patients Undergoing Percutaneous Coronary Intervention in Cardiac Center at Al-Dewaniyah City. *Iraqi National Ebrahimitabas Journal of Nursing Specialties*, 33(1), 12-20.
21. Sarani, H., Balouchi, A., Masinaeinezhad, N., & E. (2015). Knowledge, Attitude and Practice of Nurses about Standard Precautions for Hospital-Acquired Infection in Teaching Hospitals Affiliated to Zabol University of Medical Sciences (2014). *Global Journal of Health Science*, 8(3), 193–198.

- <https://doi.org/10.5539/gjhs.v8n3p193>
22. Simoes e Silva, A. C., & Oliveira, E. A. (2015). Update on the approach of urinary tract infection in childhood. *Jornal de Pediatria*, 91, S2–S10.
  23. Teshager, T., Hussien, H., Kefyalew, M., Wondimneh, F., Ketema, I., & Habte, S. (2022). Knowledge, practice and associated factors of nurses towards prevention of catheter-associated urinary tract infection in intensive care unit of public hospitals administered by Federal Government in Addis Ababa, Ethiopia: a cross-sectional institutional-based study. *BMC Nursing*, 21(1), 1–10.
  24. Tullus, K., & Shaikh, N. (2020). Urinary tract infections in children. *The Lancet*, 395(10237), 1659–1668.
  25. Waheed, N. H., & Abdulwahhab, M. M. (2022). Nurses' Knowledge and Practices concerning Physiotherapy Protocol at Intensive Care Units in AL-Nasiriyah City. *Iraqi National Journal of Nursing Specialties*, 35(1).