

## Effect of Implementing Evidence Based Nursing Guidelines on Nurses' Performance Regarding Care Provided for Children Undergoing Hemodialysis

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### Abstract:

**Background:** Dialysis nurse plays a vital role in providing information, care, support, understanding and therapeutic counseling to the pediatric patient and his/her family throughout the entire illness. The study aimed to determine the effect of implementing evidence-based nursing guidelines on performance of nurses providing care to children undergoing hemodialysis.

**Subjects and Method:** Quasi-experimental research design was utilized in this study. The study was carried out at the dialysis units of the Suez Canal University Hospitals and Ismailia General Hospital. The study included a convenience sample of 60 nurses. Two tools were used; a structured interviewing schedule and observational checklists.

**Results:** There was a highly statistically significant improvement in the studied nurses' total knowledge and practice scores three weeks after implementing the evidence-based nursing guidelines.

**Conclusion:** The study concluded that knowledge and practices of the studied nurses were improved after implementation of the evidence-based nursing guidelines.

**Key Word:** Evidence based nursing guidelines, hemodialysis, nurses' performance.

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### I. Introduction

Chronic renal failure is a major health problem worldwide. It is projected that by 2030 the number of patients with CRF will increase by nearly 60% in comparison with that of 2005(Trillini et al., 2017).

Hemodialysis removes toxins and excess fluid from the blood by pumping the child's blood through a hemodialysis machine and then reinfusing the blood into the child. Needles to remove and reinfuse the blood are inserted into an arteriovenous fistula or a graft, usually located in the child's arm. Hemodialysis is an intermittent maneuver which is done 2-4 times per week, each session is 3-4 hours, depending on several factors to deliver an efficient dialysis(Childers et al., 2015).

Evidence based nursing practice is one approach that enables nurses to manage the explosion of new literature and technology in order to improve patient outcomes. Evidence based practice allows nurses to enrich their clinical training and experience with up to date research. With the large amount of research and information that exists in nursing, learning

the skills of evidence-based practice allows nurses to search for assessing and applying the literature to their clinical situations (**Melnyk et al., 2016**).

Nursing intervention focuses on identifying signs and symptoms of renal failure and associated complications, and assessing the psychosocial effects of renal failure on the child and family (**Brown et al., 2019**).

Dialysis nurse plays a vital role in providing information, care, support, understanding and therapeutic counseling to the pediatric patient and his family throughout the entire illness. The nursing management must be provided in order to reduce the complications of renal disease and the stresses of dealing with lifelong dialysis (**Arnold-Chamney et al., 2019**).

## **II. Subjects and Method**

**Study Design:** Quasi-experimental research design was utilized in this study.

**Study Setting:** The study was carried out at the hemodialysis units of the Suez Canal University Hospitals and Ismailia General Hospital affiliated to ministry of health and population.

**Study Duration:** March 2019 to October 2019.

**Study Subjects:** A convenience sampling of sixty nurses who provide direct care to children at hemodialysis units at the previously mentioned settings (thirty-six nurses working at Suez Canal University Hospitals and twenty-four nurses working at Ismailia General Hospital) was included in the study.

### **Tools of data collection:**

Two tools were used to collect the study data:

**Tool (I):** A structured interview schedule which was developed by the researchers and written in Arabic language. It consisted of the following parts:

*Part 1:* Socio-demographic characteristics of the studied nurses as age, sex, level of education, place of work and years of experience.

*Part 2:* Nurses' knowledge about chronic renal failure and hemodialysis as anatomy and physiology of the urinary system, chronic renal failure, nursing care during hemodialysis, nursing care toward common intrahemodialytic complications and infection control precautions.

**Scoring system for nurses' knowledge was as following:**

- Correct answer was scored (1)
- Incorrect answer or do not know was scored (0)

Total score of nurses' knowledge was calculated and classified into to levels as following:

- Less than 60% was considered poor knowledge.
- 60% or more was considered good knowledge.

**Tool (II):** Observational checklists: which were adopted from (**Bowden, Greenberg 2012**) to assess nurses' practices regarding care of children undergoing hemodialysis, including predialysis nursing activities, intradialysis nursing activities, post dialysis nursing activities and nursing interventions with the common intrahemodialytic complications occurring to children during hemodialysis sessions.

### **1- Before dialysis:**

- Check vital signs.
- Measure weight.
- Observe signs of local infection which include edema, redness or swelling.
- Abdominal discomfort/ distention, nausea, vomiting, diarrhea, irritability.
- The machine patency should be checked before hemodialysis.
- Check the machine free from any problem and all alarms.

### **2- During dialysis:**

- Check blood pressure, pulse, venous pressure, arterial pressure, volume of fluid removed, and Ultra filtration rate and heparin dose delivered.
- Changing position of child.
- Activity during dialysis is largely a matter of individual preference; some children sleep throughout their treatment, others read; watching TV or carry on various activities.
- Mouth care in case of nausea or vomiting.

### **3-After dialysis:**

- Measure vital signs.
- Measure weight.
- Provide routine care for access, check circulation, record lab (BUN, serum creatinine, serum electrolytes and hematocrit).

### **Scoring system for nurses' practices was as following:**

- Done correctly and complete was scored (1)
- Done incorrect or not done was scored (0)

### **Total score of nurses' practices was classified into to levels as following:**

- Less than 60% was considered unsatisfactory.
- 60% or more was considered satisfactory.

## **Method**

### **a-Assessment phase:**

Assessment of nursing knowledge and practices regarding hemodialysis (pretest) was done using study tools I, II. The nurse's knowledge was assessed using multiple choice questions to identify the main areas of knowledge deficit two times: before and three weeks after the implementation of evidence-based nursing guidelines.

The questionnaire was administered to all nurses in simple Arabic language. The nurse's practices regarding care of children on hemodialysis were assessed using the observational checklists two times: before and three weeks after the implementation of evidence-based nursing guidelines.

### **b-Planning phase:**

Evidence based nursing guidelines were developed and planned by the researchers in Arabic language based on the study subject assessment and after reviewing the National Kidney Foundation (2019), American Nurses Association (2019), medical journals; it covered the theoretical knowledge about chronic renal failure and hemodialysis and also, practical nursing procedures regarding care of children undergoing hemodialysis.

### **c- Implementation phase:**

Preparation of suitable media such as lectures, booklets, data show, videotapes, group discussion, demonstration, redemonstration for teaching the nurses.

All nurses were divided into ten groups (six groups in Suez Canal University hospital and four groups in Ismailia General hospital) and each group consist of six nurses.

Implementation of the evidence-based nursing guidelines was carried out at the previous settings.

The evidence-based nursing guidelines consisted of 9 sessions for each group of nurses and the duration of each session ranged from 30-45 minutes.

**The first session** focused on anatomy of the renal system, functions of the kidneys, definition of chronic renal failure, types of renal failure, causes and common manifestations of chronic renal failure. **The second session** focused on periodical investigations for children with chronic renal failure, complications and management of chronic renal failure. **The third session** focused on definition of hemodialysis, mechanism of action of the dialyzer and types

of connections. **The fourth session** focused on guidelines of care for children undergoing hemodialysis regarding predialysis nursing activities as checking vital signs, measuring child weight, observing signs of local infection, abdominal discomfort/ distention, nausea, vomiting, diarrhea, irritability and checking machine patency and all alarms before hemodialysis. **The fifth session** focused on guidelines of care for children undergoing hemodialysis regarding intradialysis nursing activities as checking blood pressure, pulse, venous pressure, arterial pressure, volume of fluid removed, and ultra-filtration rate and heparin dose delivered, changing position of child and mouth care in case of nausea or vomiting. **The sixth session** focused on guidelines of care for children undergoing hemodialysis regarding postdialysis nursing activities as measuring vital signs, measuring weight, providing routine care for access, check circulation, record lab (BUN, serum creatinine, serum electrolytes and hematocrit). **The seventh session** focused on common intrahemodialytic complications, it's causes and nursing management. **The eighth session** focused on healthy dietary guidelines for children with chronic renal failure. **The ninth session** focused on infection control precautions during hemodialysis.

**d- Evaluation phase:-**

Re-evaluation of nurse's knowledge and practices was carried out using the same assessment tools three weeks after implementing the evidence-based nursing guidelines and were compared with pretest.

**Statistical analysis**

The collected data were organized, tabulated and statistically analyzed using SPSS software (Statistical Package for the Social Sciences, version 21, SPSS Inc. Chicago, IL, USA). For quantitative data, the range, mean and standard deviation were calculated. For qualitative data, which describe a categorical set of data by frequency, percentage or proportion of each category, comparison between two groups and more was done using Chi-square test ( $\chi^2$ ). Significance was adopted at  $p < 0.05$  for interpretation of results of tests of significance.

**III. Result**

Table (1) shows that more than half (58.3%) of the studied nurses were aged between 20 to 30 years with the mean age score  $28.6 \pm 5.69$  years, the majority (80%) of them were females. Slightly more than two fifth (41.7%) of them had nursing diploma. The mean years of the nurses' experience was  $5.89 \pm 4.36$ . Also, 55% of them had not attended training courses about care of children undergoing hemodialysis.

**Table 1: Percentage distribution of the studied nurses regarding their socio-demographic characteristics.**

| Socio-demographic characteristics | The studied nurses (n=60) |      |
|-----------------------------------|---------------------------|------|
|                                   | No                        | %    |
| <b>Age (years)</b>                |                           |      |
| < 20                              | 4                         | 6.7  |
| 20- 30                            | 35                        | 58.3 |
| > 30                              | 21                        | 35.0 |
| <b>Mean±SD</b>                    | <b>28.6±5.69</b>          |      |
| <b>Sex</b>                        |                           |      |
| Female                            | 48                        | 80.0 |
| Male                              | 12                        | 20.0 |
| <b>Educational level</b>          |                           |      |
| Nursing diploma                   | 25                        | 41.7 |
| Technical institute of nursing    | 23                        | 38.3 |
| Baccalaureate degree              | 12                        | 20.0 |
| <b>Years of experience</b>        |                           |      |
| <5                                | 24                        | 40.0 |
| 5- <10                            | 21                        | 35.0 |
| ≥10                               | 15                        | 25.0 |
| <b>Mean±SD</b>                    | <b>5.89±4.36</b>          |      |
| <b>Place of work</b>              |                           |      |
| Suez Canal University hospital    | 36                        | 60.0 |
| Ismailia General hospital         | 24                        | 40.0 |
| <b>Attending training courses</b> |                           |      |
| Yes                               | 27                        | 45.0 |
| No                                | 33                        | 55.0 |

Figure (1) clarifies that slightly less than two thirds (61.7%) of the studied nurses had good total knowledge mean scores before implementing the guidelines and their total knowledge mean scores improved to 88.3% after three weeks of implementing the guidelines. There was a highly statistically significant difference in total knowledge scores of the studied nurses, where p value=0.000.

**Figure 1: Total knowledge mean scores of the studied nurses (n=60).**

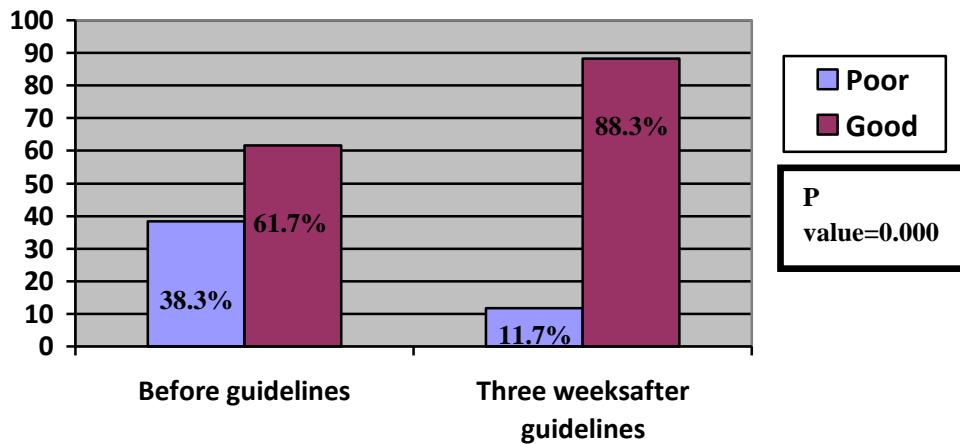


Figure (2) clarifies that more than half (55%) of the studied nurses had unsatisfactory total practice mean scores regarding pre, intra and postdialysis nursing care before implementing the guidelines, while the majority (80%) had satisfactory total practice mean scores three weeks after implementing the guidelines. There was a highly statistically significant improvement in total practice scores of the studied nurses, where p value=0.000.

**Figure 2: Total practice mean scores of the studied nurses regarding pre, intra and postdialysis nursing care for children undergoing hemodialysis (n=60).**

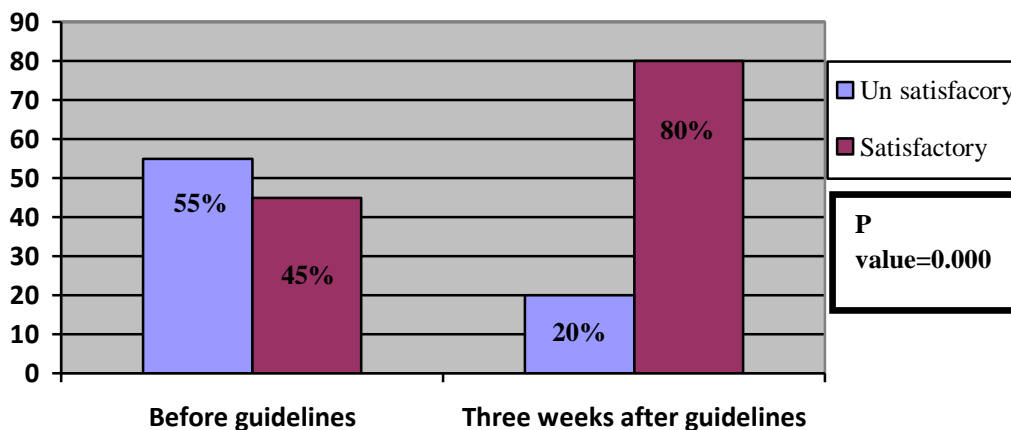


Figure (3) clarifies that slightly less than two thirds (61%) of the studied nurses had unsatisfactory total practice mean scores regarding care for children with intrahemodialytic complications before implementing the guidelines, while more than three quarters (78%) of them had satisfactory total practice mean scores after three weeks of implementing the guidelines. There was a highly statistically significant improvement in total practice scores of

the studied nurses before and after three weeks of implementing the guidelines, where p value=0.000.

**Figure 3: Total practice mean scores of the studied nurses regarding to care for children with intrahemodialytic complications.**

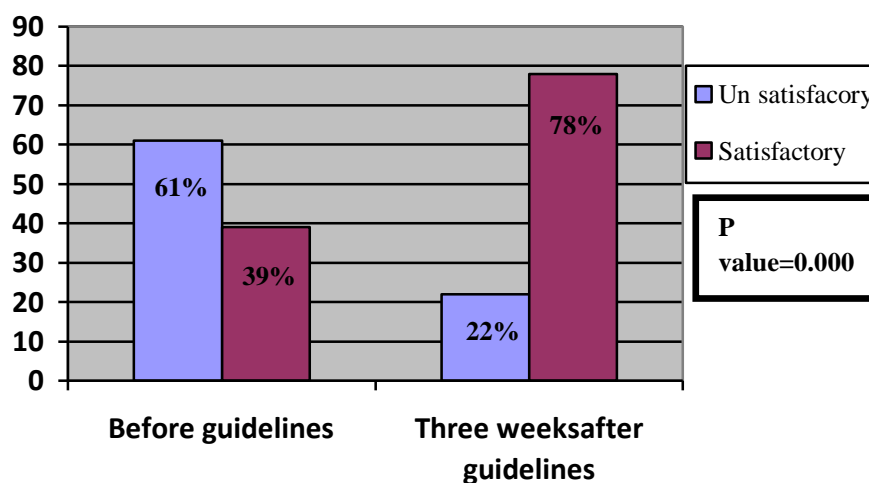


Table (2) shows that there was a statistically significant difference between the studied nurses' total mean knowledge scores and their years of experience before implementation of the evidence-based nursing guidelines, where  $X^2= 9.25$  and p value=0.010.

**Table 2:Relation between the studied nurse's total knowledge scores and their sociodemographic characteristics (n=60).**

| Nurses' sociodemographic characteristics | Before guidelines |      |      |      |             |              | Three weeks after guidelines |     |      |      |             |             |
|--|-------------------|------|------|------|-------------|--------------|------------------------------|-----|------|------|-------------|-------------|
|  | Poor              |      | Good |      | X2          | P value      | Poor                         |     | Good |      | X2          | P value     |
|  | No                | %    | No   | %    |             |              | No                           | %   | No   | %    |             |             |
| <b>Nurse age (years)</b>                 |                   |      |      |      | <b>.856</b> | <b>.652</b>  |                              |     |      |      | <b>.586</b> | <b>.795</b> |
| <20                                      | 2                 | 7.4  | 2    | 6.1  |             |              | 1                            | 100 | 4    | 6.7  |             |             |
| 20 – 30                                  | 14                | 51.9 | 21   | 63.6 |             |              | 0                            | 0   | 35   | 58.3 |             |             |
| >30                                      | 7                 | 40.7 | 10   | 30.3 |             |              | 0                            | 0   | 21   | 35   |             |             |
| <b>Educational level</b>                 |                   |      |      |      | <b>.568</b> | <b>.753</b>  |                              |     |      |      | <b>1.29</b> | <b>.394</b> |
| Diploma                                  | 8                 | 29.6 | 17   | 51.5 |             |              | 0                            | 0   | 25   | 41.7 |             |             |
| Technical                                | 16                | 59.3 | 7    | 21.2 |             |              | 0                            | 0   | 23   | 38.3 |             |             |
| Bachelor                                 | 3                 | 11.1 | 9    | 27.3 |             |              | 0                            | 0   | 12   | 20   |             |             |
| <b>Years of experience</b>               |                   |      |      |      | <b>9.25</b> | <b>.010*</b> |                              |     |      |      | <b>5.54</b> | <b>.069</b> |
| 1-<5                                     | 10                | 37   | 14   | 42.4 |             |              | 0                            | 0   | 23   | 41   |             |             |
| 5-<10                                    | 9                 | 33.3 | 12   | 36.4 |             |              | 1                            | 100 | 21   | 35   |             |             |
| ≥10                                      | 8                 | 29.6 | 7    | 21.2 |             |              | 0                            | 0   | 15   | 25   |             |             |

Table (3) shows that there was a statistically significant difference between the studied nurses' total mean practice scores and their years of experience before implementation of the evidence-based nursing guidelines, where  $X^2= 4.49$  and p value= 0.033.

**Table 3: Relation between the studied nurse's total practice scores and their sociodemographic characteristics (n=60).**

| Nurses' socio demographic characteristics | Before guidelines |      |              |      |      |         | Three weeks after guidelines |     |              |      |       |         |
|---|-------------------|------|--------------|------|------|---------|------------------------------|-----|--------------|------|-------|---------|
|   | Unsatisfactory    |      | Satisfactory |      | X2   | P value | Unsatisfactory               |     | Satisfactory |      | X2    | P value |
|   | No                | %    | No           | %    |      |         | No                           | %   | No           | %    |       |         |
| <b>Nurse age (years)</b>                  |                   |      |              |      |      |         |                              |     |              |      |       |         |
| <20                                       | 4                 | 6.9  | 0            | 0    | 1.47 | .478    | 0                            | 0   | 4            | 6.7  | .726  | .695    |
| 20 – 30                                   | 33                | 56.9 | 2            | 100  |      |         | 1                            | 100 | 34           | 58.3 |       |         |
| >30                                       | 21                | 36.2 | 0            | 0    |      |         | 0                            | 0   | 21           | 35   |       |         |
| <b>Educational qualification</b>          |                   |      |              |      |      |         |                              |     |              |      |       |         |
| Diploma                                   | 24                | 41.4 | 0            | 0    | .522 | .770    | 0                            | 0   | 25           | 42.4 | 1.63  | .441    |
| Technical                                 | 22                | 37.9 | 1            | 100  |      |         | 1                            | 100 | 22           | 37.3 |       |         |
| Bachelor                                  | 12                | 20.7 | 0            | 0    |      |         | 0                            | 0   | 12           | 20.3 |       |         |
| <b>Years of experience</b>                |                   |      |              |      |      |         |                              |     |              |      |       |         |
| 1-<5                                      | 0                 | 0    | 23           | 39.6 | 4.49 | .033*   | 1                            | 100 | 23           | 38.9 | 1.525 | .466    |
| 5-<10                                     | 1                 | 50   | 20           | 34.5 |      |         | 0                            | 0   | 21           | 35.6 |       |         |
| ≥10                                       | 0                 | 0    | 15           | 25.9 |      |         | 0                            | 0   | 15           | 25.4 |       |         |

Table (4) shows that there was no statistically significant correlation between the studied nurses' total knowledge scores and their total practice scores before and after three weeks of implementing the evidence-based nursing guidelines, where  $r=.014$  and  $.058$  respectively.

**Table 4: Correlation between the studied nurse's total knowledge scores and total practice scores (n=60).**

| Knowledge/ practice         | Pre total practice |         | Post total practice |         |
|-----------------------------|--------------------|---------|---------------------|---------|
|                             | r                  | P value | r                   | P value |
| <b>Pre total knowledge</b>  | .014               | .914    | .003                | .984    |
| <b>Post total knowledge</b> | .021               | .876    | .058                | .662    |

#### IV. Discussion

Chronic hemodialysis has many complications as cardiovascular, nutritional, gastrointestinal, hepatic, endocrinal, complications of arterio-venous fistula (AV), infections, nervous system and sleep disorders(Tobin, Girotra 2019). Pediatric nurses can help by involving the pediatric patient suffering from chronic kidney disease as much as possible in their health care decision, informing them of all treatment options and placing an emphasis on self-care(Nicholas, 2017).

The present study aimed to determine the effect of implementing evidence-based nursing guidelines on nurses' performance regarding care provided for children undergoing hemodialysis.

The present study showed that, more than half of the nurses are aged from 20 to 30 years. These results in accordance with the study of (Al-Mawsheki et al., 2016) which concluded that more than half of the nurses' age was from 20 to 30 years and also this finding comes along with that of (Bernal-Sundiang, et al., 2014) who showed that the majority (82%) of the nurse staff in hemodialysis were females. While this disagrees with (Bayoumi, Mahmoud 2017)who found that one third of the nurses were aged more than 30 years.

The study results showed that the majority of the studied nurses were females. From the researcher point of view, this may be related to the studying of nursing in Egyptian universities were exclusive for females only till few years ago. This finding is similar to the results of **(Ahamed, Sallam 2018)** and **(Mohamed, 2009)** who found that the majority of study nurses were females. Meanwhile, this result is inconsistent with **(Bakey, 2014)** in a study entitled "Evaluation of Nurses Practices Throughout Hemodialysis Treatment for Patients in Hemodialysis Unit at Baghdad Teaching Hospitals" who stated that the majority of studied nurses were males.

In relation to nurses' years of experience, the results of the present study revealed that more than one third of them had 5 - <10 years of experience. From the researcher point of view, this may be due to most of studied nurses were recently graduated. This result is in the same line with **(Hassan, 2010)** in his study titled "The Effect of Designed Nursing Protocol on Nurses Knowledge and Practice Regarding Hemodialysis Patients at Assiut Hospitals" and his results showed that less than half of the nurses had experience ranged from 5- <10 years.

In relation to the nurses' level of education, the current study revealed that slightly less than half of the studied nurses had nursing diploma; while the minority of them had nursing bachelor. This result is supported by **(Abd-Alfatah et al., 2013)** who emphasized that less than two of nurses had nursing diploma. Also, in the same line this finding agrees with **(Ibrahim et al., 2019)** who studied "nurses' performance regarding care of children undergoing hemodialysis" and their results showed that about three quarters had nursing diploma while the minority had nursing bachelors. On the other hand, this result disagrees with **(Ahamed, Sallam 2018)** who reported that more than half of the nurses had nursing bachelor.

Concerning attending training courses for hemodialysis, the current study showed that more than half of the studied nurses had not attended training courses about care of children undergoing hemodialysis. From the researcher point of view this may be related to shortage of staff, work load in hemodialysis units. This result is in accordance with **(Abdelsatir, 2013)** who reported that the nearly two thirds of studied nurses did not attended training course about patient care in hemodialysis units. On the other hand, this result disagrees with **(Marquis, Huston 2017)** in their textbook titled "Leadership Roles and Management Functions in Nursing" which stated that an adequate orientation program minimizes the likelihood of rule violation and confusion, fosters the feelings of belonging, motivation, and enhances the moral state of the new employee.

Regarding to the nurses' total level of knowledge about hemodialysis, the present study revealed that more than half and the majority of the studied nurses had good total knowledge scores before and after three weeks of implementing the evidence-based nursing guidelines respectively and there was a highly statistically significant difference in their knowledge scores before and after implementing the guidelines. This result agrees with **(El-Moghazy, 2013)** who performed study titled "Nurses Knowledge and Practice Regarding Intradialytic Complications for Hemodialysis Patient" and the results showed that the majority of nurses had satisfactory knowledge about hemodialysis. On the other hand, this result disagrees with **(Hassona et al., 2012)** who reported that the majority of the participants had unsatisfactory pre total knowledge scores about hemodialysis.

Concerning the nurses' total level of knowledge about nursing care to children undergoing hemodialysis, it was noticed that slightly less than two thirds and the majority of the studied nurses had good total knowledge scores before and after three weeks of implementing the evidence-based nursing guidelines respectively. From the researcher point of view, this may be explained by that more than one third of the nurses had 5- >10 years of experience. This result is supported by **(Abd-Alfatah et al., 2013)** who reported that the



majority of nurses had high score of knowledge related to care of child undergoing hemodialysis. On the contrary, this result is inconsistent with **(Ahmed, 2011)** who demonstrated that data collected before the designed nursing protocol implementation (pre-test) showed unsatisfactory level of knowledge about renal failure, hemodialysis and care of patients undergoing hemodialysis.

In relation to the nurses' total level of knowledge about nursing care toward common intrahemodialytic complications, the findings of the present study showed that, more than half of the studied nurses had poor total knowledge scores before implementing the evidence-based nursing guidelines, while the majority of them had good total knowledge scores after implementation and there was a highly statistically significant difference in their total knowledge scores before and three weeks after implementing the evidence-based nursing guidelines. From the researcher view, this may be explained by that more than half of the studied nurses had not attended training courses about care of children undergoing hemodialysis. These findings agree with **(Ahamed, Sallam 2018)** who revealed that the studied nurses had unsatisfactory levels towards all items of general and specific knowledge related to care of hemodialysis complications before intervention, while there was a statistical significant improvement in their level of knowledge post intervention as indicated by higher total mean scores on the posttest  $92.15 \pm 7.06$ .

Regarding nurses' total level of practice about care of children undergoing hemodialysis (pre, intra and post), the current study revealed that more than half of the studied nurses had unsatisfactory total practice scores before implementing the evidence-based nursing guidelines, while the majority of them had satisfactory total practice scores after implementation. This result is in accordance with **(Al-Mawsheki et al., 2016)** who reported that the studied nurses had unsatisfactory practice regarding care for patients during hemodialysis. On the other contrary, this result is not supported by **(Abd-Alfatah et al., 2013)** who stated that nurses had high score in their practice related to care of children undergoing hemodialysis and this may be related to more experience in caring for these children and the availability of resources in the unit.

Regarding relation between the nurses' total knowledge mean scores and their sociodemographic characteristics, the present study showed that there was a statistically significant difference between the studied nurses' total mean knowledge scores and their years of experience before implementing the evidence-based nursing guidelines, where  $p$  value=0.010 and this result is supported by **(Abd-Alfatah et al., 2013)** whose results confirmed a statistically significant difference between nurses' total knowledge and their years of experience.

Concerning relation between the nurses' total practice mean scores and their sociodemographic characteristics, the present study showed that there was a statistically significant difference between the studied nurses' total mean practice scores and their years of experience before implementing the evidence-based nursing guidelines, where  $p$  value=0.033 and this result agrees with **(Gamal, 2015)** who found the youngest nurses with less than one year experience had better practice than older nurses with more experience.

As regarding to studying the correlation between studied nurses' total knowledge and total practices regarding care of children undergoing hemodialysis therapy, the current study revealed that there was no correlation between nurses' total knowledge and their practices before and after implementing the evidence-based nursing guidelines. From the researcher point of view this may be due to studied nurses had satisfactory level of knowledge and don't implement this knowledge in their work. This result agrees with **(Ibrahim et al., 2019)** who illustrated that there was no statistically significant relation between nurses' knowledge and practice in their study. Meanwhile, this result disagrees with **(Saleh et al., 2018)** whose

results revealed that there was a strong positive correlation between nurses' total knowledge and their total performance.

### **V. Conclusion**

In the light of the study results, it was concluded that knowledge and practices of the studied nurses were improved after implementation of the evidence-based nursing guidelines.

### **VI. Recommendations**

In the light of the current study findings, the following recommendations are suggested:

1. Periodic explanation and demonstration of evidence-based nursing guidelines for all nurses to improve clinical outcomes of children during hemodialysis sessions.
2. Inservice training programs should be conducted periodically and regularly for all nurses working in hemodialysis units.
3. Dialysis units should have a written policy about the standardized nursing care that should be delivered to every patient in the unit.

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