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Implementing Standards of Care for Children Undergoing Dental Anesthesia

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Abstract: **Children are at risk from conditions affecting both dental and soft-tissues, dental caries are the commonest in childhood; therefore, these standards considered the guidelines for prevention of dental caries. Prevention requires a multifactorial approach including dietary factors and eating habits, the use of appropriate fluoride therapy, the application of fissure sealants and the implementation of effective oral hygiene.**

The aim of this study was to determine nurses' performance related to standards of care for children undergoing dental anesthesia.

Subjects and Method: The study was conducted at Pedodontic Unit, Pediatric Dentistry, Surgery, Oral Medicine and Orthodontics departments at Faculty of Dentistry-Tanta University: A Quasi experimental research design was used. All nurses who working at previous mentioned units were included in this study (35 nurses).

Tools of data collection three tools were used to collect data ; Experts opinion schedule of children undergoing dental anesthesia. Structured questionnaire schedule related to children undergoing dental anesthesia and Nurse's practice observation checklist for implementation the standers of care.

Results showed that, before standard total nurses knowledge scores were poor while as almost of them had good scores immediately after standard application. The total practice scores of the studied nurses related to care provided to children under dental anesthesia before standard were fair. While immediately after standards application, the total practice scores for nurses were good(91.4).

Conclusion: There was statistical significant difference before and after program implementation regarding nurse's knowledge and practice.

Recommendation: were suggested that, Dental nurses should be provided with periodic training to be familiar with the new information about dental anesthesia which used for children through providing them with handout and posters. A manual of nursing care standards for children under dental anesthesia should be available for pediatric dental nurses as guidance for them in deal with children under dental anesthesia and their families.

Keywords: **Dental Anesthesia, Knowledge, Practice, Teaching Program.**

1. INTRODUCTION

Dental caries is the commonest oral disease of childhood so that the dental role should encompass the whole of oral care for children.[1,2] The aims of such care are firstly to ensure that all children are free from pain, sepsis and the destruction of dental tissues. Secondly, to monitor the developing dentition. Thirdly, to support children and their families in forming good oral health habits, practices and behaviors which can be carried forward into adulthood.[3,4]

The importance of diet for health has been emphasized. Dental health education must incorporate wise food choices for healthy living generally, which emphasize unrefined carbohydrates, moderate protein and low fat. Many high-sugar foods are also high in fat, and dentally orientated advice must take account of this.[5,6] Children often take medicines in a syrup

form as it improves compliance. Some children have to take medicines several times during the day and night for long periods and if those medicines contain sugar the threat to the child's teeth is considerable.[7,8] Children who have already experienced dental caries or who are at risk from the consequences of dental caries should have a dietary diary completed over a 3 to 4 day period .[9,10]

It is agreed that dietary supplements are not generally suitable as a public health measure and that they should be directed towards children who require them and who live in areas with suboptimal water fluoride levels .[11,12] Children considered to be at low risk of caries when living in fluoridated areas or using fluoride supplements and should use low-fluoride formulations.[13] Low caries risk children include regular attenders at the dentist, who have or well-controlled caries and those whose parents show a high degree of motivation (including carrying out/helping with, or supervising tooth brushing and exercising good dietary control) .[14,15]

Children with a higher risk of developing caries should use a standard of infant paste. For this purpose, children at high risk may be taken to include children with a disability that affects their dental care and those who are medically compromised.[16,19] Children with numerous new or recurrent carious lesions and with radiographic evidence of progression of lesions, those having sweetened medicines and/or with poor dietary control and those receiving little assistance with tooth brushing may also be regarded as being at high risk.[17,18]

Aim of the Study:

The aim of this study is to: Determine nurses` performance regarding standards of care for children undergoing dental anesthesia.

2. SUBJECTS AND METHOD

Research Design

A quasi experimental research design was used in the study

Setting:

This study was conducted at Pedodontic unit, pediatric dentistry, surgery, oral medicine and orthodontics departments at faculty of dentistry-Tanta University

Subjects:

All nurses working in above previously mentioned settings. Were in this study, the total number of 35nurses at (Pedodontic unit were had eight nurses provided care for twelve chair, pediatric dentistry were had seven nurses for sixteen chair, surgery, oral medicine were had five nurses for thirty six chair and orthodontics were had four nurses for fifty six chair).

Tools of data collection:

Three tools were used to collect the necessary data.

Tool I: Experts opinion schedule of children undergoing dental anesthesia:

This tool had been developed to elicit the opinions of specialists group regarding the basic competencies of the nurses involved in the provision of direct care to dental children under anesthesia. The tool covered 14 major board competencies and its sub-competencies are (22).

Basic competencies of dental care are:-

Pre-anesthesia assessment which include:-

-Child assessment.

- Psychological preparation for the child and the parent.

- Physical preparation.

During anesthesia which include:

- Position of the child.

- Restrain of the child if needed.

- Used techniques to distract child attention.

Post anesthesia assessment

-Providing care for the child post anesthesia.

- Explain for complications of dental anesthesia.

- Received medication after discharge.

Tool II: Structured questionnaire schedule related to children undergoing dentalanesthesia:

It was used to assess the nurses` knowledge and skills regarding children undergoing anesthesia. It included the following parts:-

Part I: Socio-demographic characteristics of the nurses included in the study suchas: age, education, marital status, residence and level of years of experiences.

Part II: Nurses` knowledge assessment questionnaire schedule

Group of questions assessed the nurses` knowledge regarding the care which provided for children undergoing dental anesthesia such as: knowledge of the nurses regarding anesthesia as definition, types, causes for dental caries, signs of dental problems, precaution before, immediate and after dental anesthesia….ect.

A scoring system for nurses' knowledge: was followed as:

-Correct & complete answer (2)

- Correct & incomplete answer (1)

- Incomplete answer or didn't know (0)

The total score of nurses` knowledge were classified as follow:

- 70% and more were considered good level of knowledge.

- 60% to less than 70% were considered fair level of knowledge.

- Less than 60% were considered poor level of knowledge.

Tool III: Nurse's practice observation checklist for implementation the standers of care:

An observation check list was developed by the researcher based on the established standards to assess the competency level of nurses` performance during the care of children undergoing dental anesthesia. It was used for observing every nurse during different nursing procedures.

Scoring system for nurses` practices was classified as the follow:

- Done was scored (1).

- Not done was scored (0).

Scoring system for nurses` practices was classified as the follow:

- 70% and more were considered satisfactory.

- Less than 70% were considered unsatisfactory.

Method:

1-Administrative Process:-

Permission was directed to the responsible authorities of Faculty of Dentistry at Tanta University in order to obtain their approval to collect the data and facilitate the research implementation after explaining its purpose.

2- Ethical Considerations:

-Nature of the study didn`t cause any harm or pain to the participating of the study.

-Confidentiality and privacy were taken into consideration regarding the data collection.

3- Tool Development:

Three tools had been used in the current study. Tool (1),Tool (II),Tool(III): It was divided into four section as follows:

a): Nurse's practice observation checklist for implementation the standers of care.

b): Pre-anesthesia fear: It was used to determine the child fear.

c): Post- anesthesia: frequency and type of post-anesthesia complication.

d): Post- anesthesia pain: It was used to explain the faces which the child feel due to pain.

4- A Pilot Study: A pilot study was carried out on 10% of the study sample to test the clarity, applicability and consistency of the different items of the study tools and time needed for each one. It was excluded from the study sample.

5- Content validity of the tools: The tools of the study had been tested for content validity by 5 jury experts in the field of Pediatric Nursing and modification was carried out accordingly.

Phases of the study:

1- Assessment phase: The basic competence and its underlined activities regarding care for children under dental anesthesia was developed by reviewing the related literature.

- The researcher conducted an interview with the experts group using

Tool (I) Explanation about the aim of the study to elicit their opinions regarding the expected competencies (knowledge and skills) on care provided for children under dental anesthesia. Any items in the structured questionnaire agreed by 60% of the experts group had been included in the standards. Items which were considered essential by specialists in the dental field was also included.

-Framework of the standards had been determined as the structure-process-outcome:-

-Structure:-the attributed of settings where care had been delivered.

-Process:- components detail plan of the appropriate nursing attentions or behaviors required to implement nursing care.

-Outcomes:- components identify the expected results of care.

- Emphasize was placed on "process standard" since it identifies what is expected from every nurse and describes what the nurse does.

-The researcher had been assessed nurses` competencies (knowledge and skills) regarding the management of dental children using tool(III). this tool had been used three times:

1- Before the implementation of the standards nursing care protocol.

2- Immediately after the implantation of the standards nursing care protocol.

3- Three month after implementing the standards nursing care protocol.

2- Planning phase: It is based on the results of questionnaire, observational checklist and reviewing the most recent related literature and the program was involved. Preparation for teaching was chosen.

3- The program implementation phase: The program was carried out in outpatients dental units according to nurses` workplace. The program consisted of 5 sessions. The action plane was done through a structured interview with the nurses. The suitable media for teaching to nurses as lectures, video group discussion demonstration and remonstration were used during the program presentation according to the content of each session. every session lasts for 20 minutes.

Nurses were divided into five groups according to the number of nurses where presented in each dental unit and each group included in the study in 5 sessions. If nurses did not attended the session for any reason, the contents of the session were explained to them later or when they come for the next session as a review with others. Each group has attended the following sessions:

- **The first session:** At the beginning of the initial interview, an orientation to the program and its objectives took place. this session includes informing nurses about dental anesthesia including: definition, causes, benefits, side effects which expected.

- **The second session:** It begins with a review of concepts which was previously presented in the first session and progressed to the next level which focuses on: Explanation about precaution for prepare the child before anesthesia such as fasting, prepare the child psychological and providing physical assessment. This content is presented to nurses through discussion of related concepts.

- **The third session:**

- Defining of disinfection and methods of disinfection.

- Defining of sterilization.

- Explanation for different methods for sterilization of equipment.

- Environmental disinfection and its importance.

- **The fourth session:** It was concentrated on providing standards of care for nurses about practice during dental anesthesia which include:

Position of children.

Restrain of the child if needed.

Prevention of accidental hazards.

- **The fifth session:** It was focused on providing the standards of care for nurses about practice Post-dental anesthesia which include:

- Providing care for the child after anesthesia.

- Explain complication of dental anesthesia that expected.

- Received medication after discharge.

- Use technique of destruction to attract attention and relive pain.

- Providing adequate health teaching for mothers and their children

- Follow up for dental clinic.

4- Evaluation phase: The standards implementation was evaluated immediately and one month after implementation of teaching program using constructed tools III.

Statistical analysis:

The collected data were organized, tabulated and statistically analyzed using SPSS software. For quantitative data, mean and standard deviation were calculated. For qualitative data, using Chi-square test (χ^2). For comparison between means of two groups of parametric data Z value of Mann-Whitney test was used. For comparison between more than two means of non-parametric data, Kruskal-Wallis (X^2 value) was calculated. Correlation between variables was evaluated using Pearson's correlation coefficient (r).

3. RESULTS

Table (1) It was noticed that all experts (100%) were agree with providing past medical and surgical history, history of previous sedation and fasting status. On the other hand, more than sixty percent of experts were not agreeing with illustrate current medication and allergies.

Table (2) It was observed that all experts (100%) were agree with basic competencies for nursing care of children during dental anesthesia such as put the child in comfortable position, restrain of the child if needed and use techniques to distract child attention. In addition, all experts (100%) were agree regarding items of prevention of accidental hazards such as avoid sharp instruments near to the child, equipment of the procedure must be covered and take precaution during dental procedure.

Table (3) It was noticed that all experts (100%) were agree regarding items of providing care for the child post anesthesia such as observe vital signs as respiration, temperature and pulse, observe skin color and provide diet information.

Table (4) As the table shows, the age of the nurses ranges from 22 to 58 years. Regarding nurses` age, it was showed that more than one third of nurses (31.4%) were in the age group of 40 to 50 years. Besides, more than twenty eight percent of nurses were ranges from 30 to 40 years. Twenty two percent of nurses range from 20 to 30 years with a mean age 38.69$\pm$10.28. In addition, more than half of nurses (57.1%) were at the diploma education level. About two third of nurses were living in rural area. Furthermore, the majority of nurses (97.1%) were married.

Table (5) It was noticed that the answers of 40% of the nurses were correct in definition of anesthesia before standard application while immediately after and after three months from standard the answers of the nurses were (54.3%) and (68%) correct and complete in their knowledge. There was statistical significance difference (P=0.001).

Table (6) The table illustrates in relation to child assessment that the majority of the nurses (88.6%) were not perform past medical and surgical history before the standard application, whereas immediately after and after three months from application the nurses` performance were (45.7% and 34.3% respectively) and there was statistical significance difference(P=0.001).

Table (7) It was noticed that 14.3% of nurses were put the child in comfortable position before the standard application, whereas immediately after and after three months their performance were(42.9% and 25.7% respectively) and there was statistical significance difference(P=0.025).

Table (8) It was observed regarding providing care for the child post anesthesia that 8.6% of nurses performance related to provide diet information before application of standard, while immediately after and after three months of the standard application their performance were (51.4% and 48.6% respectively) and there was statistical significance difference(P=0.002).

In addition, the result also revealed in the same table regarding received medication after discharge that all nurses were not explain name, route and time of medications before application of standard, whereas immediately after and after three months of application their performance were(42.9% and 34.3% respectively) and there was statistical significance difference(P=0.006)

The same table also illustrate that all nurses were not explain the possible side effects of the therapy before application of standard, but immediately after and after three months nurses` performance were(31.4% and 17.1% respectively) and there was statistical significance difference(P=0.003).

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Table (1): Experts` opinion of pre-anesthesia schedule for children undergoing dental anesthesia.

Experts opinion of pre- dental anesthesia	(n=18) Agree		(n=18) Not agree	
	No	%	No	%
Child assessment:				
-Past medical and surgical history.	18	100	0	0.0
-History of previous anesthesia.	18	100	0	0.0
-Current medications, allergies.	15	83.3	3	16.7
-Damaged or loose teeth.	18	100	0	0.0
-Fasting status.	18	100	0	0.0
Psychological preparation for the child and parents:				
-Explain diagnosis in simple words.	14	77.8	4	22.2
-Encourage the child to express his/ her feelings.	18	100	0	0.0
-Encourage the parents to verbalize their feelings.	18	100	0	0.0
-Communicate with the parents effectively.	18	100	0	0.0
Physical preparation:				
-Measure temperature to the child.	18	100	0	0.0
-Take pulse and respiration for the child.	18	100	0	0.0
Provide suitable diet for the child:				
-The diet must be suitable to the child age.	18	100	0	0.0
-Offer food in good presentation.	18	100	0	0.0
-Offer food rich with calcium.	18	100	0	0.0
-Diet rich with proteins as milk.	18	100	0	0.0
-Give fresh juice and fruits to the child.	18	100	0	0.0
-Avoid sharp food.	18	100	0	0.0
Providing safe and effective nursing care:				
-Hand washing.	18	100	0	0.0
-Wearing mask.	18	100	0	0.0
-Wearing gown.	18	100	0	0.0
-Wearing sterile gloves.	18	100	0	0.0
Preparation for the equipment and supplies:				
-Recognize types of instruments.	18	100	0	0.0
-Recognize methods of sterilizations.	18	100	0	0.0

Table (2): Experts opinion of during anesthesia schedule for children undergoing dental anesthesia

Experts opinion of during dental anesthesia	(n=18) Agree		(n=18) Not agree	
	No	%	No	%
-Put the child in comfortable position.	18	100	0	0.0
-Restrain of the child if needed.	18	100	0	0.0
-Use techniques to distract child attention	18	100	0	0.0

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Prevention of accidental hazards:				
-Avoid sharp instruments near to the child.	18	100	0	0.0
-Equipment of the procedure must be covered	18	100	0	0.0
-Take precaution during dental procedure.	18	100	0	0.0

Table (3): Experts opinion of post anesthesia schedule for children undergoing dental anesthesia.

Experts' opinion of post anesthesia schedule for children undergoing dental anesthesia.	(n=18) Agree		(n=18) Not agree	
	No	%	No	%
Providing care for the child post anesthesia.				
Observe vital signs.	18	100	0	0.0
Observe skin color.	18	100	0	0.0
Provide diet information.	18	100	0	0.0
Explain for complications:				
Post-operativepain and dental bleeding.	18	100	0	0.0
Inability to eat a normal meal.	18	100	0	0.0
Received medication after discharge				
Explain five rights of medications.	18	100	0	0.0
Explain the possible side effects of the therapy.	14	77.8	4	22.2
Providing adequate health teaching for child or his/her parents about:				
A cold diet taken for 5- 10 days.	18	100	0	0.0
Teaching about regular follow-up.	18	100	0	0.0

Table (4): Percentage distribution of the studied nurses related to socio demographic characteristic.

Characteristic ofstudied nurses	(n=35)	
	No	%
Age in years:		
20< 30	8	22.9
30< 40	10	28.6
40< 50	11	31.4
50- 60	6	17.1
Range	22-58	
Mean±SD	38.69±10.28	
Educational level:		
Bachelor	7	20.0
High institute	8	22.9
Diploma	20	57.1
Residence:		
Urban	11	31.4
Rural	24	68.6
Marital status:		
Married	34	97.1
Divorced/widow	1	2.9

Previous training		
Yes	17	48.6
No	18	51.4
Duration of experience in dental units in years		
<5	8	22.9
5< 10	12	34.3
10< 20	6	17.1
20+	9	25.7
Range	6-34.3	
Mean+SD	16.87±10.004	
Duration of experience in other units		
None	15	42.9
<5	7	20.0
5< 10	7	20.0
10< 20	3	8.6
20+	3	8.6
Range	3-42	
Mean+SD	13.51±12.03	

Table (5): Percentage distribution of studied nurses related to their knowledge about dental anesthesia.

Nurses knowledge about dental anesthesia.	(n=35) Before standards		(n=35) Immediatel y after		(n=35) three months after		X^2	P
	No	%	No	%	No	%		
Definition of anesthesia	14	40.0	19	54.3	24	68.6	22.286	0.001*
Types of anesthesia for dental extraction for children	10	28.6	22	62.9	20	57.1	27.263	0.001*
Causes of dental problems	13	37.1	27	77.1	22	82.9	26.778	0.001*
Manifestation of dental problems	14	40.0	25	71.4	23	65.7	30.000	0.001*
Investigation of dental problems	11	31.4	24	68.6	13	37.1	22.933	0.001*
Aim of dental problem care	11	31.4	27	77.1	25	71.4	21.909	0.001*
Nurses evaluation of dental problems	13	37.1	24	68.6	26	74.3	24.100	0.001*
Nursed role for safe environment	15	42.9	29	82.9	26	74.3	17.789	0.001*
Measures to reduce pain	11	31.4	26	74.3	23	65.7	31.143	0.001*

*Significant at level (P< 0.05)

N.B. Numbers are not mutually exclusive.

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Table (6): Percentage distribution of studied nurses related to their practices of pre-receiving dental anesthesia assessment.

Nurses practices of pre- dental anesthesia.	(n=35) Before standard application		(n=35) Immediate after standards		(n=35) Three months after standards		X^2	P
	Done	Not done	Done	Not done	Done	Not done		
	%	%	%	%	%	%		
Child assessment:								
-Past medical and surgical history.	11.4	88.6	45.7	54.2	34.3	65.7	14.431	0.001*
-History of previous sedation.	14.3	85.7	54.3	45.7	48.6	51.5	12.282	0.002*
-Current medications.	2.9	97.1	45.7	54.3	31.4	68.6	19.924	0.001*
-Damaged or loose teeth.	14.3	85.8	57.1	42.9	40.0	60.0	10.227	0.006*
-Fasting status.	25.7	73.3	48.6	51.4	40.0	60.0	3.391	0.183
Psychological preparation for the child and parents:								
-Explain diagnosis in simple words.	2.9	97.1	45.7	54.3	37.1	62.9	12.822	0.002*
-Encourage the child to express his/ her feelings.	14.3	85.7	51.4	48.6	34.3	65.7	13.169	0.001*
-Encourage the parents to verbalize their feelings.	22.9	77.1	51.4	48.6	48.6	51.4	9.360	0.009*
-Communicate with the parents effectively.	8.6	91.4	51.4	48.5	31.4	68.5	11.301	0.004*
Provide suitable diet for the child:								
-The diet must be suitable to the child age.	11.4	88.6	45.7	54.3	28.6	71.5	12.870	0.002*
-Offer food in good presentation.	2.9	97.1	28.6	71.4	20.0	80.0	8.400	0.015*
-Offer food rich with calcium.	22.9	77.1	68.6	31.4	51.4	48.6	15.500	0.001*
-Diet rich with proteins as milk.	25.7	74.3	54.3	45.7	60.0	40.0	10.783	0.005*
-Give fresh juice and fruits.	14.3	85.7	51.4	48.6	42.9	57.1	12.026	0.002*
-Avoid sharp or hard food.	2.9	97.2	48.6	51.5	28.6	71.5	13.889	0.001*
Providing safe and effective nursing care:								
-Hand washing.	20.0	80.0	48.6	51.5	40.0	60.0	5.856	0.053
-Wearing mask.	22.9	77.1	51.4	48.6	31.4	68.6	10.384	0.006*
-Wearing gown.	25.7	74.3	34.3	65.7	34.3	65.7	1.000	0.607
-Wearing sterile gloves.	45.7	54.3	71.4	28.6	71.4	28.6	6.781	0.034*
Preparation for equipment and supplies:								
-Recognize types of instruments.	100	00.0	100	00.0	100	00.0	0.000	1.000
-Recognize methods of sterilizations.	48.6	51.5	60	40.0	57.1	42.9	1.300	0.522

*Significant at level (P< 0.05)

Table (7): Percentage distribution of studied nurses related to their practice of during anesthesia assessment.

Nurses performance of during dental anesthesia.	(n=35) Before standard application		(n=35) Immediate after standard		(n=35) Three months after standards		X^2	p
	Done	Not done	Done	Not done	Done	Not done		
	%	%	%	%	%	%		
Put child in comfortable position.	14.3	85.8	42.9	57.1	25.7	74.3	7.365	0.025*
Restrain of the child if needed.	8.6	91.4	48.6	51.4	42.9	57.1	14.333	0.001*
Use techniques to distract child attention	8.6	91.4	45.7	54.3	34.3	65.7	6.371	0.41*
Prevention of accidental hazards:								
Avoid sharp instruments near to the child.	25.7	74.3	57.1	42.9	54.3	45.7	10.091	0.006*
Equipment must be covered	28.6	71.5	57.1	42.9	48.6	51.4	6.820	0.33*
Take precaution during dental procedure.	20.0	80.0	51.4	48.6	40.0	60.0	10.894	0.004*

*Significant at level (P< 0.05)

Table (8): Percentage distribution of studied nurses related to their practice of post dental anesthesia assessment.

Nurses practice of post dental anesthesia.	(n=35) Before standard application		(n=35) Immediate after standard		(n=35) Three months after standard		X^2	P
	Done	Not done	Done	Not done	Done	Not done		
	%	%	%	%	%	%		
Providing care for the child post anesthesia.								
Close observation to the child	20.0	80.0	31.4	68.6	17.1	82.9	3.180	0.204
Observe vital signs.	0	100.0	0	100	0	100	0.000	1.000
Observe skin color.	2.9	97.1	20	80.0	11.4	88.6	5.400	0.067
Provide diet information.	8.6	91.4	51.4	48.6	48.6	51.4	7.663	0.002*
Explain complications:								
Post-operativepain and dental bleeding.	2.9	97.1	48.6	51.5	40	60.0	17.659	0.001*
Inability to eat.	17.1	82.9	51.4	48.6	40	60.0	6.110	0.047*
Received medication after discharge								
Explain name, route and time of medications.	0	100	42.9	57.1	34.3	65.8	10.215	0.006*
Explain the possible side effects of the therapy.	0	100	31.4	68.6	17.1	82.9	11.375	0.003*
Providing adequate health teaching for child or his/her parents about:								
A cold diet taken for 5- 10 days.	5.7	94.3	45.7	54.3	42.9	57.1	12.024	0.002*
Teach about regular follow-up.	28.6	71.5	71.4	28.6	57.1	42.9	14.000	0.001*

*Significant at level (P< 0.05)

4. DISCUSSION

The findings of the present study revealed that nurses who provided care for dental children had insufficient knowledge and performance as general regarding dental anesthesia, even though there was a significant improvement in nursing staff knowledge and performance after the standards application in relation to the care of dental children. These findings were in accordance with Khalil(2012)[20]and Lakshmi(2007)[21]who stated that there was improvement in staff knowledge and performance after standards application.

The present study figured out that all the nurses attended no any previous in-service training programs related to dental anesthesia. These results might be attributed to absence of continuous education in the hospital, increase work load and limited numbers of nurses in each department where in some department there were just four nurses provided care for fifty six chair/ bed. These findings were in accordance with Khalil(2012)[20] where he emphasized the importance of in-service education. These findings were contradicted with many researchers as Kassem(2015) [22] who reported that all nurses attended no any previous in-service training programs related to infection control measures.

In relation to nurses' knowledge about anesthesia, the study results reflected that two thirds of nurses` answers were incompetent regarding their knowledge related to some items before application of standards namely: definition of anesthesia causes of dental problems in children and aim of dental problems care. These results could be attributed to lack of concern among hospitals to inform nurses with their information about anesthesia in form of educational sessions or periodic workshop.[22] Moreover, nurses might not be concerned with the importance of their awareness about types of anesthesia in other departments in which they were fixed in one department and not shifting among other departments and no need to inform about it. Furthermore, causes for dental problems were known for the nurses as medical activities. While immediately after the standard application about three quarters of nurses` knowledge were competent, these might be attributed to the fact that nurses were liable to learn and acquire knowledge through the standard application. Danasu (2007)[23] who supported this issue and mentioned that after the application for standard of care, the nurses acquired knowledge that guided and improved their practice.

Treating dental pain is important as it is difficult and risky; Pain is difficult to measure due to its subjectivity..[27,28] Children not have the language skills to communicate the level of pain they are feeling and assessing pain levels often depends on the report of parents or pain scale indicators.[29,30] The findings of the present study also clarified that about two thirds of nurses` knowledge before standards application regarding measures to reduce pain were incorrect. These results of the present study might be due to lack of training program related to pain management and absence of highly experienced supervision. These findings were in agreement with Khalil (2012)[20] who mentioned that lack of knowledge results in poor nursing management of pain.

The present study revealed that about three quarters of nurses were incompetent in providing safe and effective nursing care regarding to perform complete hand washing, wearing mask and wearing gown pre-anesthesia before the standards application. This result could be attributed to the fact that works for the nurses became a habit and lack of concern among the hospital to provide administrative supervisors responsible for ensuring from implementation of infection control in each department. In addition, limited educational level with older age for some nurses might be interfere with their performances and provided safe and effective nursing care.[25] Moreover, this was attributed to their attitude of "leave it to god" and negligence.

These findings are in congruent with many results as Kassem(2014) [22] and Adam (2011) [24]who stated that the quality of hand hygiene competence remained disappointed. Also El-sayed(2012) [25] are supported these findings regarding infection control skills. On the other hand, these findings were contradicting with Ead (2007) [26] who reported that the majority of operating room nurses had good performance related to most steps of environmental safety.

Unfortunately, the findings of the present study revealed that none of the studied nurses were perform information for children and their parents regarding post anesthesia assessment about received medication after discharge before the standard application and increased to include more than one third of them immediate and after three months from the standards application. These findings could be attributed to nurses believes that duties were doctors activities and they were not aware with each type of medication and its side effects.[20]

5. CONCLUSION

Based on the findings of the present study, it is concluded that nurses who provided nursing care for children under dental anesthesia have poor knowledge and performance before the standard application, whereas immediately after and after three months of the standard application the total score of knowledge and practice for nurses were impaired.

RECOMMENDATION

1. Dental nurses should be provided with periodic training to be familiar with the new information about dental anesthesia which used for children through providing them with handout and posters.
2. A manual of nursing care standards for children under dental anesthesia should be available for pediatric dental nurses as guidance for them in deal with children under dental anesthesia and their families.
3. Nurses should provide educational training program about infection control and dentistry hospitals should be provided with administrative supervisors responsible for ensuring from implementation of nursing care which provided for children under dental anesthesia.
4. Further researches should be conducted about nursing care for dental anesthesia to improve nurses` knowledge and practice regarding children under dental anesthesia.

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