

Effect of Core Competencies Based Educational Guideline on Pediatric Nurses' Decisions Related to Pain Management

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Abstract Pain is a natural and unavoidable part of childhood. It is the most common side effect of hospitalization. The aim of the study was to assess the effect of core competencies based educational guideline on pediatric nurses' decisions related to pain management. A quasi-experimental design was used. The study was conducted in the Pediatric Department of El-Menoufia University and Shebin El-Kom Teaching Hospital in Shebin El-Kom city. A convenient sample of 60 registered nurses from the above-mentioned settings was selected. One tool used in this study is the Knowledge and Attitude survey regarding pain questionnaire. It included five parts; part one contains socio-demographic data of studied nurses, part two involves 4 yes /no questions, part three involves 25 true/false questions, part four: contains 8 multiple-choice questions, Part five contains two cases –based scenarios. The results of the study showed that the nurses' knowledge and reported practice about assessment and management of pain were 8.666 ± 4.065 pre-intervention compared to 18.616 ± 2.40 and 15.05 ± 2.86 on the post and follow up intervention respectively. The study concluded that implementation of core competencies based educational guideline improved pediatric nurses' level of competent knowledge, decisions and reported practices regarding assessment and management of pain in children. Therefore, the study recommends that Core competencies based educational guide training must be implemented at all pediatric units to provide nurses with competent knowledge and skills regarding effective assessment and management of children pain.

Keywords: core competencies, pain management, pediatric nurses

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1. Introduction

Pain is considering one of the major sources of distress for children and their families as well as health care providers. Children may experience pain as a result of medical conditions such as surgery, injuries, acute and chronic illness. It can result in serious physical and emotional consequences [1]. Pain is one of the most misunderstood, under diagnosed and under treated health problems especially in children due to the subjective nature of [2].

Pain is an unpleasant sensory and emotional experience associated with actual and/ or potential tissue damage according to the International Association for the Study of Pain [3]. According to the Institute of Medicine (IOM), approximately 100 million American suffer from chronic pain at an estimated annual cost of approximately 600 billion Dollars [4]. Unfortunately, pain is a natural and unavoidable part of childhood. It is the most common side effect of hospitalization. Previous studies report that almost 80% of hospitalized children experience moderate to severe pain [5]. Untreated pain has adversely effect on

cardiovascular, respiratory, immunological system, delays recovery and prolongs period of hospitalization [6].

In a pediatric patient, it is more difficult to assess and treat pain effectively as in adults. The lack of ability to observe the pain, immaturity of remembering painful experiences and the persistence of myths related to the infant's ability to perceive pain [7]. However, the management of pain in childhood is like the adult management practices which involves both pharmacological and non –pharmacological interventions [3].

Children and their families have the right to receive pain management that both timely and effective. The accurate assessment and effective management of childhood pain is a vital nursing role requiring a nurse who possesses an accurate theoretical knowledge base of pain, its assessment, management and appropriate attitudes [1].

Despite the importance of pain in clinical practice, its management receives little emphasis in the curricula of most health care professional education programs [8]. Previous researches demonstrated a deficit in knowledge and improper attitudes regarding pain assessment and management in pediatric patients [9,10]. Inadequate education for nurses is a major and persistent barrier to safe and

effective pain management [11]. Education and training have shown an improvement in the knowledge and attitudes regarding pain and also improved pain management practices among the nursing staff [12]. Various educational methods to improve the assessment and management of pain by nurses have been tried. A study conducted by [13], revealed that education altered nursing practices, pain assessment and usage of non-pharmacological interventions.

Core pain management competencies for pediatric nurses have not yet been established. The absence of core competencies may be a reason for the paucity of pain education found in educational programs for undergraduate. The limited pain education that is currently provided may be ineffective because of its focus on traditional topics such as anatomy and physiology that may have little relevance to the daily problems faced by patients, families, and clinicians [14]. Core competencies for pain management include four domains; domain one focuses on the nature of pain; domain two relates to how pain is assessed, quantified and communicated and domain three focuses on how pain is relieved, diversity of treatment options and flexibility of care; domain four focus on How does context influence pain management. Assessment of these core competencies is more closely aligned with the quality of clinical care that is the assessment of knowledge alone. Core competencies for pain management represent a minimum standard that may be emphasized in each educational undertaking, depending on each profession's unique needs, roles, and expectations as well as for each educational program and institution [11].

By relieving pain and stress, the health care provider faces a less anxious and more cooperative child, resulting in a better medical outcome [15]. To provide effective nursing management of pain in children, nursing personnel must have core competencies for assessment and management of pain. These competencies may help to bridge the gap between knowledge, learning and clinical performance [11].

2. Aim of the Study

The aim of this study was to assess the effect of core competencies based educational guideline on pediatric nurses' decisions related to pain management...

2.1. Hypotheses

It was hypothesized that:

1. Pediatric nurses who receive core competencies based educational guideline will have a higher level of knowledge related to pain assessment and management in posttest than the pre-test
2. Pediatric nurses who receive core competencies based educational guideline will have a higher level of reported practices and correct decision related to pain assessment and management in posttest than pretest.

2.2. Theoretical and Operational Definition

2.2.1. Core Competencies

It is defined by [16], as "standard set of performance domains and their corresponding behavioral standards which a nurse is required to demonstrate".

2.2.2. Nursing Competency

It is defined by [17]. "as an observable, measurable, a performance-based outcome that indicates the achievement of a particular knowledge component, application, or demonstration of a psychomotor behavior or skill. In this study, Core Competencies Based Educational Guideline helps nurses to enhance their current knowledge and skills for effective assessment and management of pain in children, it was assessed by using Knowledge and Attitude Survey Regarding Pain Questionnaire [9].

3. Subject and Method

3.1. Research Design

Quasi-experimental design was utilized for this study (pre and post-test).

3.2. Settings

The study was conducted in the Pediatric Department of El-Menoufia University Hospital "Neonatal Intensive Care Units (NICU), high-risk unit, pediatric medical units" and Shebin El-Kom Teaching Hospital in Shebin El-Kom city, Egypt.

3.3. Sample

A convenient sample of 60 registered nurses who are working in the above-mentioned settings were selected

3.4. Inclusion Criteria

All nurses working in the above-mentioned settings and were exposed to pediatric patients on a daily basis were selected

3.5. The Tool of the Study

The tool used for data collection is Knowledge and Attitude Survey Regarding Pain Questionnaire. It was adopted from [9]. and utilized by the researchers after their permission to assess nurse's knowledge, reported practices and decisions related to pain assessment and management. It comprised of the following parts:

Part one: Includes socio-demographic data of studied nurses as age, qualifications, years of experience, marital status, working department and having children.

Part two: Includes 4 yes /no questions to assess pediatric nurses' perceptions regarding pain assessment such as a previous hearing of pain assessment tools, its usefulnessetc.

Part three: Involves 25 true/false questions that constructed to assess pediatric nurse's knowledge and decision about assessment and management of pain in children. It contains questions about reliable indicators of the severity of pain, pain intensity, combination of analgesic...etc.

Part four: contains 8 multiple-choice questions. It includes information about pediatric nurses reported practices for the administration of analgesics such as route of administration, types of drugs, dose, and frequencyetc.

Part five: Involves two cases –based scenarios contains 4 questions that determine pediatric nurses' decisions about pain intensity in children and type of medication that should be given.

3.5.1. Scoring System

Scoring system for knowledge of the studied nurses was calculated as the following:

- The total number of true/false questions was 25 and the total score was 25.
- The total number of multiple–choice questions was 8 and the total score was 8.
- The total number of cases–based scenarios questions was 4 and the total score was 4.
- The question was scored as one if it has a correct answer or zero scores when it has an incorrect answer.

3.5.2. Tool Development

The tool was developed by the researchers for data collection after a review of past and current literature related to assessment and management of pain in children using books, articles, periodicals and magazines to get acquainted with the various aspects of the research problem. Preparation of tool was carried out over a period of three months including expert's opinions, validity, and reliability test.

3.5.3. Validity Assurance Purpose

Tool was submitted to a jury of five experts from the Faculty of Nursing Staff "three professors in pediatric nursing and two professors in adult health nursing".

3.5.4. Ethical Considerations

Nurses were informed about the privacy of their information, the study was voluntary, harmless, and anonymous and confidentiality of responses would be respected. Nurses had the full right to refuse to participate in the study at any time. Formal consent was obtained.

3.5.5. Pilot Study

A pilot study was carried out on 6 nurses "10 %" of the sample in order to test the applicability of tool and clarity of the included questionnaire as well as to estimate the average time needed to fill the questionnaire. Those who shared in the pilot study were excluded from the main study sample.

3.5.6. Reliability of the Tool

Reliability test was done by using test-retest and Pearson Coefficient factor was 90.8%. The questionnaire was applied to them and retested after 2 weeks. The degree of Spearman's rank correlation coefficient test was 0.82, it can be concluded that the tool has a high level of reliability.

4. Program Construction

The overall goal of the educational guideline is to improve pediatric nurses' core competencies based knowledge and performance regarding effective assessment and management of pain. Domains of core competencies based educational guideline for pain assessment and management: it was developed by [11].

4.1. Domain One

Nature of pain: What is pain? This domain focuses on the concepts of pain including the science, experience of pain and pain's impact on the children.

1. Explain the nature of pain.
2. Explain theories for understanding pain.
3. Define pain
4. Explain types and associated sign and symptom.
5. Explain how cultural affect assessment and management of pain.
6. Common myths about pain for children

4.2. Domain Two

Pain assessment: How pain is recognized? This domain focuses on how pain is assessed and quantified, in addition to how pediatric nurses affect these activities.

1. Use reliable and valid tools for pain assessment
2. Assess associated symptoms and related outcomes
3. Demonstrate empathic during pain assessment.

4.3. Domain Three

Management of pain: How is pain relieved? This domain focuses on treatment options, risk management, and treatment based on the understanding of the clinical condition.

1. Identify pain treatment options.
2. Identify pain treatment risks and benefits.
3. Develop a treatment plan based on intensity and types of pain
4. Differentiate physical dependence, addiction, and non-adherence.
5. Describe the pediatric nursing role and practice in pain management

4.4. Domain Four

Clinical conditions: How does context influence pain management?

This domain focuses on the role of the nurses in the application of the competencies developed in domains 1-3 in the context of varied children age, settings, and care teams.

1. Describe pain assessment and management unique needs for children
2. Implement a pain management plan in the perspectives of patients and their social support
3. The context of available resources for pain assessment.
4. Describe the role of the nurses as an advocate in assisting children to meet treatment goals

5. Data Collection Procedure

5.1. Written Permission

Official permission to carry out the study was obtained from the administrators of each setting after submitting an official letter from the Dean of the Faculty of Nursing, El-Menoufia University explaining the purpose of the study. Meetings were conducted first with the administrator of each setting to obtain permission for conducting the research and explaining the aim and the expected outcome of the study.

5.2. Program Implementation

Data collection was carried out over a period of six months, starting from June 2018 to December 2018.

5.2.1. Assessment Phase

Nurses were assessed individually at the beginning of the study for their knowledge regarding nature of pain, definition, and its causes, types, assessment, and management of pain in children (pre-test).

5.2.2. Program Development

Based on the results obtained from pretest which determined the weak points of the nurses' knowledge, decision and reported practices regarding pain in children, the program was prepared after reviewing by specialized staff in the pediatric nursing field and modified by the researcher's according to their comments and the related literature. The program utilized in the current study was available in several forms (booklet, handouts, and pamphlets). It was provided to the nurses during the teaching sessions as a reference. The program instructions were written in the Arabic language to be easily understood by the nurses.

5.2.3. Planning Phase

This program was planned to be provided in two days. The first day was for first and second domains and the second day for third and fourth domains of core competencies based guideline for pain assessment and management.

5.2.4. Implementation Phase

Program was implemented in the "Pediatric Intensive Care Units (NICU), high-risk unit, pediatric medical units" of El-Menoufia University Hospital and Teaching Hospital in Shebin El-Kom city. A clear and simple explanation was offered to nurses about the aim of the study and its expected outcomes. Nurses were divided into 10 groups, 2-6 nurses in each group. This Program was provided in 4 sessions (two sessions for first and second domains and two sessions for third and fourth domains). Time for each session was ranged from half to one hour. Sessions were given in two days a week (Mondays and Tuesday) over a period of two and a half months. Explanation of the program was started by domain one: This domain focuses on the concepts of pain. Domain two: This domain focuses on how pain is assessed, quantified. Domain three: focuses on treatment options, risk management, and treatment. Domain four: focuses on the role of the nurses in the application of the competencies developed in all domains. Time was opened for subjects to ask questions and receive the corresponding answers as well as to express their feedback toward the teaching sessions. Program booklet was given to each nurse as an educational reference during program implementation and self-learning reference after program implementation. Suitable teaching aids were used for the program by distributing color pictures, handouts, and pamphlets. Positive reinforcement was provided for nurses in the form of psychological recognition through saying good, excellent, nodding and reward.

5.2.5. Evaluation Phase

Nurses' knowledge, decisions, and reported practices were reassessed immediately after program implementation (posttest). Reassessment for the retention was carried out three months later (follow up test).

6. Data Analysis

Data were statistically analyzed by SPSS version 22. Percentage, mean scores, standard deviation, and F-test were used for parametric data. Pearson's Correlation analysis was used to show the strength and direction associated between the two quantitative variables. P value <0.05 is considered significant. Qualitative data were presented in the form of frequency distribution tables, number, and percentage. It was analyzed by the chi-square (χ^2) test.

7. Results

Table 1 showed that 43.3% of studied nurses were less than 25 years old while 6.7% of them were more than 35 years old. As regard nurses' years of experience, the same table showed that 36.6% of nurses had 5-10 years of experience.

Table 1. Distribution Of Nurses According To Their Characteristics

Items	No	%
Age		
20 -25	26	43.3
26-30	18	30.0
31-35	12	20.0
36-40	4	6.7
Years of experience		
-≤ 2 years	9	15%
-2- ≤5 years	15	25%
-5-≤10 years	22	36.6%
-10-≤15 years	8	13.3%
-more than 15	6	10%
Total	60	100%

Table 2 showed that nurses had more correct perceptions about pain assessment on the post and follow up test than on pretest; therefore, there were highly statistically significant differences between nurse's perceptions at 1% level of significance

Table 3 displayed that Pediatric nurses had the highest score of correct knowledge and decision on post-intervention. In other words nurses had correct knowledge regarding the following items " children who are less than two years of age have decreased pain sensitivity (90%), children who can be distracted from pain usually have mild pain (93.3%), the duration of analgesia of 1-2 mg fentanyl IV is 4-5 hours (81.3%) , patients have the right to expect total pain relief as the goal of treatment (95%), continuous assessment of pain is important for good pain management (93.3%), comparable stimuli in different people produce the same intensity of pain (83.3%)". Therefore, there were highly statistically significant differences at 1% level of significance.

Table 2. Pediatric Nurses' Perceptions Regarding Pain Assessment Pre, Post and Follow-Up Intervention

Perceptions about pain assessment tools	Pre		Post		Follow up		χ^2	P -value
	No 60	%	No 60	%	No 60	%		
Have you previously heard of pain assessment tools								
Yes	31	51.7	59	98.3	53	88.3	34.84	0.001
No	29	48.3	1	1.7	7	11.7	19.20	0.001
Are assessment tools useful								
Yes	35	58.3	58	96.7	51	85.0	25.281	0.001
No	25	41.7	2	3.3	9	15.0	10.50	0.002
Would you like to use these scales in routine care								
Yes	45	75.0	56	93.3	48	80.0	7.566	0.005
No	15	25.0	4	3.3	12	20.0	.341	.331
Are you currently using any sort of assessment tools								
Yes	12	20.0	31	51.7	22	36.7	13.08	.001
No	48	80.0	29	48.3	38	63.3	6.617	.09
Total	60	100	60	100	60	100		

Table 3. Pediatric Nurse's Knowledge and Decision About Assessment And Management Of Pain Pre , Post And Follow-Up Intervention

ITEMS	Pre		Post		Follow up		χ^2	p-value
	No 60	%	No 60	%	No 60	%		
Vital signs are reliable indicators of the severity of a pain Correct	18	30.0	40	66.6	30	50.0	16.15 5.00	.001 0.02
Children less two years of age have decreased pain sensitivity Correct	44	73.3	54	90.0	48	80.0	5.566 .745	.013 .12
Children who can be distracted from pain usually have mild pain Correct	42	70.0	56	93.3	47	78.3	10.90 1.80	.001 .297
Patients can sleep in spite of severe pain. Correct	7	11.7	31	51.7	25	41.7	22.18 31.57	.001 .001
The Combining of analgesics may result in better pain control Correct	8	13.3	44	73.7	26	43.3	43.98 24.67	.001 .001
The duration of analgesia of 1-2 mg fentanyl IV is 4-5 hours Correct	35	58.3	49	81.7	37	61.7	7.77 .310	.05 .577
Opioids avoided in patients with history of substance abuse Correct	0	0.0	43	71.7	26	43.3	67.01 33.1	.001 .001
Patients should be encouraged to endure as much pain as possible before using an opioid Correct	0	0.0	41	68.3	32	46.7	11.10 34.63	.001 .001
Children under 11 years not able to report pain, so clinicians should depend on the parents' assessment of the child's pain intensity. Correct	18	30.0	45	75.0	28	53.3	24.361 7.673	0.001 0.006
Spiritual beliefs may lead patient to think suffering and pain are necessary Correct	26	43.3	44	3.3	39	65.0	11.109 5.61	0.001 0.01
After the first dose of opioid analgesic is given, another doses should be adjusted in accordance with patient's response Correct	9	15.0	38	63.3	31	51.7	29.4	0.001 0.001
Absence of pain expression does not mean lack of pain. Correct	26	43.3	45	75.0	37	61.7	12.45	.001 .04
Patients should be maintained in a pain-free state Correct	18	70.0	47	78.3	39	65.0	17.36	.010 .001
If a patient reports pain relief, he should be given a lower dose of the analgesic Correct	27	45.0	49	81.7	42	70.0	17.368 7.673	0.001 .006
Patients can tolerate high doses of opioids without respiratory depression Correct	0	0.0	42	70.0	24	40.0	64.61 30.01	0.001 0.001
Estimated pain by physician or nurses is a more valid measure of pain than the patient self-report. Correct	35	58.3	46	76.7	37	61.7	4.59 .139	.025 .705
Patients may be hesitant to ask for pain medications due to their fears about use of opioids Correct	18	30.0	41	68.3	37	61.7	17.63 12.11	.001 .001
Patients have the right to expect total pain relief as the goal of treatment Correct	44	73.3	57	95.0	51	85.0	2.476	.001 .08
Continuous assessment of pain a is important for good pain management Correct	41	68.3	56	93.3	47	78.3	12.10 1.53	.001 .215
Giving opioids on a regular basis is preferred over a PRN schedule for continuous pain Correct	9	15.0	42	70.0	34	56.7	37.136 22.65	.001 .001
Patient should experience discomfort before giving the next dose of analgesic Correct	18	30.0	43	71.7	35	58.3	19.200 9.766	.000 .002
Comparable stimuli in different people produce the same intensity of pain. Correct	44	73.3	50	83.3	45	75.0	1.768 .043	.18 .83
Heat, music, imagery, etc., are very effective for mild to moderate pain control but didn't helpful in severe pain Correct	7	11.7	40	66.7	35	58.3	38.088 49.41	.001 .001
Increasing in dose of morphine will not increase pain relief Correct	9	15.0	41	31.7	34	56.7	33.14 22.65	.001 .001
In order to be effective, heat and cold should only be applied to the painful areas. Correct	19	31.7	38	63.3	33	45.0	13.89 9.968	.001 .002
Total	60	100	60	100	60	100		

Table 4. Pediatric Nurses Reported Practices for Administration of Analgesics Pre, Post And Follow-Up Intervention

Items	pre		post		Follow up		χ^2	p-value
	No 60	%	No 60	%	No 60	%		
• The route of administration of opioid analgesics post-operative Correct	44	73.3	56	93.3	50	83.3	8.640 1.768	0.003 .184
• Drug used for the treatment of prolonged moderate to severe pain for post-operative Correct	45	75.0	51	85.0	47	78.3	2.47 .409	.08 .522
• Analgesics should initially be given post-operative Correct	24	40.0	45	75.0	39	65.0	15.038 7.519	.001 .005
• Why patient with pain would request increased doses of analgesic Correct	51	85.0	60	100.0	53	88.3	9.073 .288	.001 .591
• The most accurate judge of the patients pain intensity is Correct	34	57.7	45	90.0	42	70.0	17.04 2.297	.001 .130
• Narcotic/opioid addiction is defined Correct	35	58.3	50	83.3	42	70.0	9.076 1.776	.003 .183
• The peak time effect of fentanyl is Correct	44	73.3	52	86.7	50	83.3	3.33 1.768	.521 .184
• The peak time morphine given orally, is Correct	7	11.7	40	66.7	37	61.7	38.008 53.494	.001 .001
Total	60	100	60	100	60	100		

Table 5. Pediatric Nurses' Cases –Based Scenarios Decisions About Pain Intensity In Children Pre ,Post And Follow Up Intervention

Items	Pre		post		Follow up		χ^2	p-value
	No 60	%	No 60	%	No 60	%		
A1-Ahmed is 14 years and post-operative. As you enter his room, he smiles, vital sign was BP:120/80, HR: 80, RR: 18. On a scale of 1-10, he rates his pain 8. On the patients chart you must mark his pain as Correct	11	18.3	50	83.3	39	65.0	50.7 26.88	.001 .001
A2-He has received paracetamol 2 hours before the assessment. Pain assessments reveal range of 6-8. He has identified 2 as an acceptable level of pain relief. Fentanyl is to be given as required. What will be your next step Correct	4	6.7	42	70.0	35	58.3	50.90 36.505	.001 .001
B1- Heba is 14 years old and post-operative. As you enter his room, she is lying quietly and grimaces as she turns in bed. Vital sign was BP: 120/80, HR: 80, RR: 18. On a scale of 1-10, she rates his pain 8. On the patients chart you must mark her pain as Correct	18	30	48	80.0	41	68.3	53.57 37.56	.0001 .001
B2-She has received paracetamol 2 hours before the assessment. Pain assessments reveal range of 6-8. She has identified 2 as an acceptable level of pain relief. Morphine is to be given as required. What will be your next step Correct	17	28.3	46	76.7	40	66.7	28.10 17.67	.001 .001
Total	60	100	60	100	60	100		

Table 6. Mean Total Score of Pediatric Nurse's knowledge, practices and Cases Based Scenarios Pre, Post and Follow Up Intervention.

Total Score	Pre intervention Mean ± SD	Follow up intervention Mean ± SD	Post intervention Mean ± SD	F Test	P Value
Nurse' s knowledge and decision about assessment and management of pain	8.666±4.065	15.05±2.86	18.616±2.40	150.0	<0.001
Nurses reported practices for administration of analgesics	4.716±1.22	5.866±1.51	6.816±1.17	38.61	<0.001
Nurses' cases –based scenarios decisions about pain intensity in children	1.01±.833	2.583±1.31	3.11±.866	67.396	<0.001

Table 4 showed that highest percentage of Pediatric nurses on post-intervention had correct reported practices regarding items of " the route of administration of opioid analgesics post-operative, analgesics should initially be given post-operative , the most accurate judge of the patients pain intensity, the peak time morphine given orally were 93.3%,75.0%, 90.0% and 66.7% respectively ".

for this reason, there were highly statistically significant difference at a 1% level of significance.

Table 5 revealed that Pediatric nurse had the largest percentage (83.3% and 80.0% respectively) scores of the correct response to scenarios on post-intervention in scenario 1 and scenario 2. Therefore, there were highly statistically significant differences at 1% level of significance.

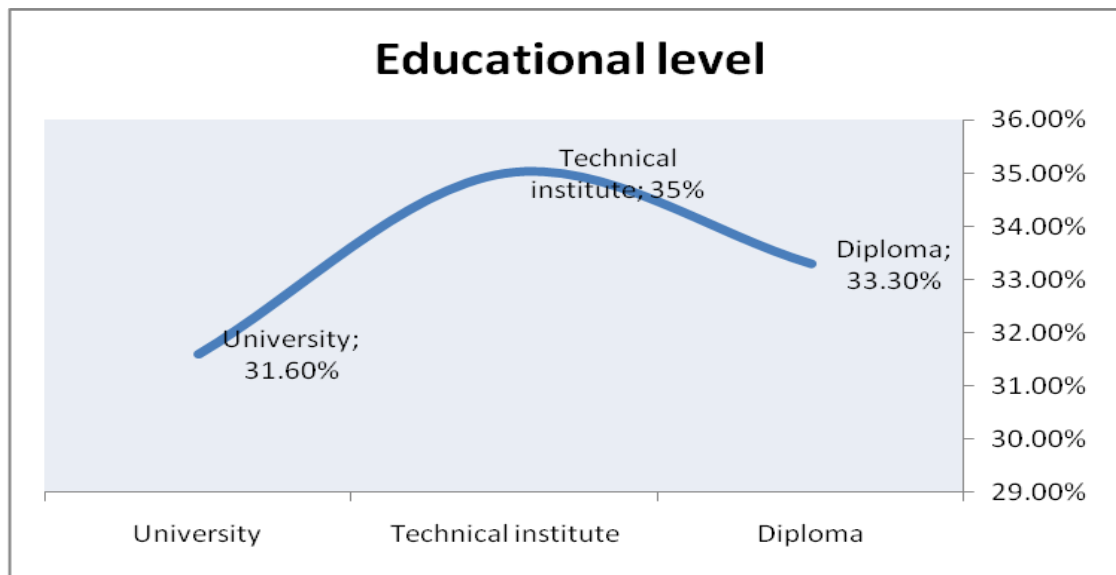


Figure 1. Educational level of nurses

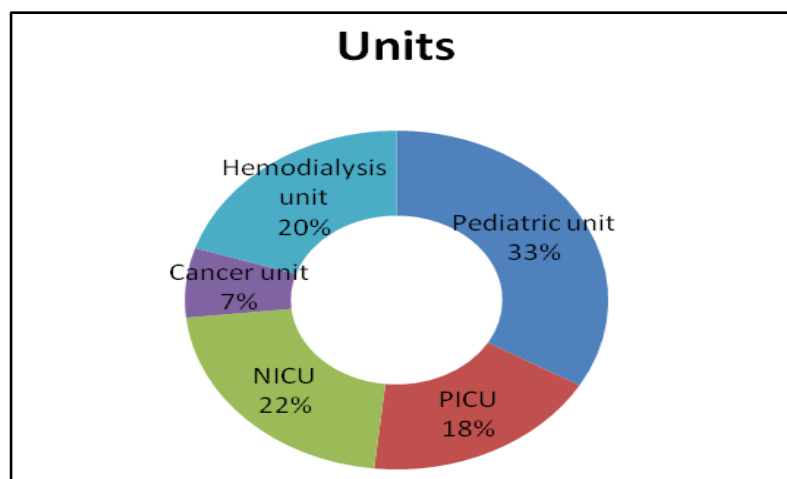


Figure 2. Distribution Of Nurses Working Areas In Selected Settings

Table 6 illustrated that the highest level of total mean scores of Pediatric nurses' knowledge was on the post-test. The mean and standard deviation of total knowledge score of pain assessment and management on pre-intervention was 8.666 ± 4.065 compared to 18.616 ± 2.40 and 15.05 ± 2.86 on the post and follow up intervention respectively. Therefore, there were highly statistically differences at 1% level of statistical significance.

Figure 1 clarified that 35% of nurses had technical institute while 31.6% of them had a university education

Figure 2 showed that the majority of nurses (33%) worked at pediatric medicine units, Meanwhile, 7% of them worked in cancer units.

8. Discussion

Children may experience a painful stimulus more than adults, due to stronger inflammatory response, the highest percentage of pediatric patients enter to the hospital due to pain instead of adults, This may be due to the wrong belief regarding the suffering of pain, such as children can't remember painful experience [1]. Pain is a complex issue,

nurses and other health care providers responsible for the assessment and treatment of patients with pain. Nurses are responsible to ensure that a patient has appropriate evidence-based nursing care for pain assessment and management which effectively treats the patient's pain and provide standardized care.

The current study hypothesized that "Pediatric nurses who received core competencies based educational guideline have a higher level of knowledge, reported practices and correct decision related to pain assessment and management on the posttest than pretest". The results of the current study support the study hypotheses. The finding demonstrated that the staff nurses in selected settings have inappropriate perceptions regarding pain assessment, previously heard pain assessment tools and its usefulness. This could be due to lack of nurses' awareness of the importance of pain assessment and management in children. This result comes in agreement with [18,19], in their study about "Jordanian nurses knowledge and attitude regarding pain management." who reported that the health care providers mainly nurses and physician have lack of knowledge of pain assessment tools. Also, [10,20] in their study about "Knowledge and attitudes

regarding postoperative pain among the pediatric cardiac nursing staff.". They reported that health care providers have insufficient knowledge and attitude regarding pain assessment and management.

In addition, the results of the present study demonstrated that the staff nurses in selected settings have competent knowledge post-intervention instead of pre-intervention regarding pain assessment and management. These findings support the first research hypothesis. The study found that less than one-third of nurses were aware that vital signs are a reliable indicator for the severity of pain on pre-intervention while about two-thirds of them were aware of this post-intervention. This can be rationalized as nurses have a lack of knowledge about the reliable indicator of pain. Also, this reflects the effectiveness of the educational guide on improving nurses' knowledge. These findings came in agreement with [21]. in their study about " Knowledge and attitudes regarding neonatal pain among nursing staff of pediatric department: an Indian experience" who found that around twenty percent of nurses were aware that the vital signs are reliable indicators for severity of pain. However [22] in their study about "Can fluctuations in vital signs be used for pain assessment in critically ill patients with a traumatic brain injury" They reported that vital signs are not specific indicators for pain assessment and detection.

According to nurses' knowledge of patients' ability to sleep in spite of severe pain. The current study found that a small percentage of nurses have the correct knowledge on pre-intervention, this may be interpreted as nurses were unable to distinguish between children response and adult response for severe pain. This finding was inconsistent with [23]. in their study about " Knowledge and attitudes of nurses regarding pain in the intensive care unit patients in Rwanda "who found that about two-thirds of nurses reported correct knowledge about patient ability to sleep in spite of pain severity.

In relation to nurses' knowledge of the combining of analgesics, the current study revealed that more than two-thirds of nurses have correct knowledge post-intervention instead of a small percentage on pre-intervention. This result came in agreement with [24], in their study about "Analgesic drugs combinations in the treatment of different types of pain" who found that most nurses didn't know that combinations of analgesic improved pain, thereby leading to dose-sparing effects and improved patient safety.

Regarding opioids and patients history of substance abuse, the present study revealed that all nurses have incorrect knowledge on pre-intervention instead of more than two-thirds post-intervention. This may be rationalized as a lake of nurses' awareness concerning pharmacotherapy and side effects of opioids. This finding came in agreement with [25]. in their study about " Knowledge and attitude about pain and pain management among critical care nurses in a tertiary hospital" who reported that ICU nurses have a deficit of knowledge regarding pain management when dealing with ICU patients, they found that less than half of studied nurses have correct knowledge about pain assessment and management and less than one third of them have correct knowledge of using opioids.

In relation to nurses` knowledge about the ability of children under 11 years to report pain, the current study

showed that one-third of nurses have the correct knowledge on pre-intervention instead of more than two-thirds of them post-intervention and more than half in follow up test. This reflects the effectiveness of the educational guide on improving nurses' knowledge. This result came in the line of agreement with [26], in their study about "Palestinian Nurses Knowledge and Attitudes Regarding Pain Management" who found that only one-third of nurses were aware of the children ability to report pain.

In relation to patients 'ability to tolerate high doses of opioids without respiratory depression, the present study showed that all nurses didn't have the correct knowledge in pre-intervention while on post-intervention, it raised to two-thirds of nurses. This may be interpreted as the nurses have competent knowledge after implementing an educational guideline. These findings came in agreement with [27]. in their study about " Knowledge and attitudes about cancer pain management" who indicated that nurses have to a lack of knowledge about opioids and their consequences on patient`s health.

As regard using non pharmacological pain management such as heat, music, imagery, the current study revealed that only small percentage of studied nurses considered that these methods are very effective for mild to moderate pain control but didn't help in relieving severe pain in pre-intervention, instead of about two thirds of them in post and follow up intervention. This can be rationalized as nurses have a false perception about the importance of nonpharmacological methods on controlling pain. This study result was consistent with [28]. in their study about " Saudi Arabian Nurses' Knowledge and Attitudes Regarding Pain Management" who reported that nurses require more information regarding the administration of analgesics, using pharmacological and non - pharmacological interventions to relieve pain.

Regarding nurses reported the practice of analgesics administration, the current study found less than half of nurses reported correct answer for these questions" analgesics initially be given post-operative, the peak time morphine given orally". This may be interpreted as nurses have poor knowledge about methods of analgesic administration. This finding is consistent with [29,30], in their study about " The impact of an integrated pharmacology and medicines management curriculum for undergraduate adult nursing students on the acquisition of applied drug/pharmacology". Who reported that the majority of nurses have poor knowledge in pharmacotherapy and different methods of analgesics administration. The finding of the current study supported the second research hypothesis.

Regarding nurses' decision about pain intensity in cases based scenarios, it was noted that only less than twenty of nurses correctly answered the question regarding the evaluation of the patient who had no behavioral change in pre-intervention, however, more than two-thirds of them correctly answered in post-intervention. As well as only one-third of nurses correctly answered case scenarios that had behavioral change instead of the majority of them in post-intervention. This might be interpreted as the effectiveness of an educational guideline in improving nurses' judgment of pain intensity. This came in agreement with [31], in their study about "Nurses' and Nursing Students' Knowledge and Attitudes

regarding Pediatric Pain" who reported that nurses have poor knowledge and judgment about behavioral or physical responses of patients that may reflect the intensity of pain.

In summary, the findings of the current study supported the first and second research hypotheses. In other words, Implementation of core competencies based educational guideline for pediatric nurses was effective in improving nurses' knowledge, perception, clinical performance and developing positive attitudes regarding assessment and management of pain in children.

9. Conclusion

Based on the findings of the present study, the following is concluded:

Implementation of core competencies based educational guideline improved pediatric nurses' level of competent knowledge, decisions and reported practices regarding assessment and management of pain in children

10. Recommendations

1. Ongoing in-service training must be designed and implemented at all pediatric units to provide nurses with core competencies regarding effective assessment and management of children pain.
2. The curriculum of pediatric nursing must include core competencies regarding effective assessment and management of pain in children.
3. The stakeholders should upgrade the knowledge and clinical skills of nurses regarding the new trends in pain assessment and management.
4. Repeat this study with a large sample of nurses for generalization of the findings.

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