



Journal Homepage: -www.journalijar.com
**INTERNATIONAL JOURNAL OF
 ADVANCED RESEARCH (IJAR)**

Article DOI:10.21474/IJAR01/ 9282
 DOI URL: <http://dx.doi.org/10.21474/IJAR01/9282>



RESEARCH ARTICLE

THE IMPACT OF AN EDUCATIONAL PROGRAM FOR NURSES ON HOW TO ASSESS PAIN IN CHILDREN IN GOVERNMENTAL PEDIATRIC HOSPITALS IN KHARTOUM STATE.

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Manuscript Info

Manuscript History

Received: 15 April 2019
 Final Accepted: 17 May 2019
 Published: June 2019

Key words:-

pain, assessment, nurses, children.

Abstract

Background: An Interventional study was conducted in Governmental Pediatric Hospitals in Khartoum State, Sudan. Totally five hospitals were taken for consideration and the distribution of nurses in these hospitals are as follows (15%) from Gaffer Ibn Auf , (7 %) Abdurrahman Al Mahdi, (44%) Mohammed Alamein Hamed pediatric hospital, (17%) Ahmed Gassim and (17%) AlBulk pediatric hospital (169) nurses. This study aimed to assess the impact of an educational program for nurses on how to assess pain in children.

Methodology: Data was collected by interviewing candidates using questionnaires that covered objectives under study and Data was analyzed by using SPSS (Statistical package for social sciences) computer program.

Results: In this present study most of the participant's nurses are from 31to 40 years old comprising of the male by 7.7% and female by 92.3%. The result shows the change in knowledge among nurses about different pain assessment scales in children after they received an educational program (P. value 0.00). 91.7% of governmental pediatric hospitals in Khartoum state does not have pain assessment tools for measuring pain intensity and 85.8% of nurse's desire to use pain assessment tool after the implementation of the educational program and 89.9 % before the implementation of the educational program in governmental pediatric hospitals in Khartoum state.

Conclusion: The deficits in pain assessment can be improved by implementing pain education programs in hospitals.

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Introduction:-

Many children who attend the Emergency Department (ED) whether with trauma or illness, are suffering from pain. An important role of the ED is to detect and assess the pain and manage it appropriately to minimize the distress and discomfort of treatment.⁽¹⁾

Also, medical procedures are often painful, unexpected, and heightened by situational stress and anxiety leading to an overall unpleasant experience. Although the principles of pain evaluation and management apply across the

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human lifespan, infants and children present unique challenges that necessitate consideration of the child's age, developmental level, cognitive and communication skills, previous pain experiences, and associated beliefs.⁽²⁾

To treat pain adequately, ongoing assessment of the presence and severity of pain and the child's response to treatment is essential. Reliable, valid, and clinically sensitive assessment tools are available for neonates through adolescents.⁽³⁾

Pain assessment is an essential part of the pain management process. Research has demonstrated that when routine standardized nursing pain assessment is implemented, patients receive improved analgesia, experience less pain, and are more satisfied with care.⁽⁴⁾

Pain can be assessed using self-report, behavioural observation, or physiologic measures, depending on the age of the child and his or her communication capabilities. Specific measures vary in their validity and usefulness. Accurate acute pain assessment requires consideration of the plasticity and complexity of children's pain perception, the influence of psychological and developmental factors, and the appreciation of the potential severity and specific types of pain experienced.⁽⁵⁾

Assessment tools:

Several valid and reliable pain assessment tools have been developed so that more objective data on pain assessment can be collected. Both self-report and behavioural instrument is available. Children benefit when a pain assessment tool is used because they are given a simple and effective way to communicate the pain they are experiencing. The assessment tool provides more objective data, with less chance that the more discreet signs of pain will be overlooked. Unfortunately, they are not always used consistently and appropriately in the clinical setting.⁽⁶⁾

Materials and Methods:-

Study Design:

Interventional study pre-post training hospital-based will be used to study the impact of an Educational Program for nurses on how to Assess and Manage pain in Children in governmental Pediatric Hospitals in Khartoum State.

Study Area:

Governmental pediatric hospital in Khartoum state, Sudan. The five hospitals are Gaffer Ibn Auf , Abdurrahman Al Mahdi, Mohammed Alamein Hamed, Ahmed Gassim and AlBulk pediatric hospital.

Study Population:

All categories of nurses working in these pediatric governmental hospitals in Khartoum State, Sudan.

Inclusion criteria:

1. Full-time pediatric nurses in governmental pediatric hospitals in Khartoum State.
2. Fully qualified nurses working in these pediatric hospitals at least for six months.
3. Caregiver nurses.

Exclusion criteria:

Nurses in pediatric hospitals in Khartoum State aspartimers nurses and nurses who refuse to participate in this study.

Sampling and sample size:

Calculated by using the standard formulas for determining Sample size:

$$n = N / 1 + N (D^2)$$

n: Is the desirable sample size

N: Is the population size (universe).

D: Is the degree of accuracy desired (or the accepted margin of error) and is usually set to 0.05.

Simple random sampling, I took all staff names from every hospital then made this name in the separated numeric list to any hospital. I choose a random number from a list for any hospital according to the proportion of hospital from the total sample size.

Data collection tools and techniques:

Standardized self-interviewing Questionnaire that covered questions related to participant's demographic background, knowledge toward pain assessment in children that includes:

1. Part-I: consists of six items on personal data mainly professional qualification, year of experience and to attend a training course in pain assessment and management.
2. Part 1: contains questions that determined the availability of pain assessment tools for measuring pain intensity in his / her ward.
3. Part 2: contains questions that examine, study sample, knowledge regarding pain assessment and pain assessment tool.

Data collection technique:

Data were collected by the researchers and the research team after the data was collected and nurses were taught the education program by small group discussion. The researcher went to a different department in a certain hospital and stay with a group of nurses before data collection. The purpose of this study was explained and the study sample was asked for their consent. Data collected firstly using predesigned Structured interview questions was to assess the knowledge and attitude of study sample regarding pain assessment among children. Then education program was introduced as lecture and small group discussion, six months later after program implementation data was recollected again using the same methods.

Analysis and Data processing:

Data were analyzed using SPSS (Statistical package for social sciences) program.

Ethical consideration:

Official consent was obtained from the research committee at Alneelain University. Permission was secured from the Federal Ministry of Health, State Ministry of Health and the Department research management then written consent was obtained from the hospital's research committee. After that consent form signed from head nurses to any hospital participated in the study. The last was a proxy consent from the participants themselves.

Confidentiality maintained throughout the research process. The proposal, including the questionnaire, was approved by the ethical and scientific committees of the Faculty of Nursing Sciences, Alneelain University.

Results:-

The interventional study was conducted in Governmental Pediatric Hospitals in Khartoum State during the period from 15-7-2018 to 20 -2- 2019, to study the Impact of an Educational Program for Nurses on How to Assess Pain in Children. Data were obtained from a sample of 169 pediatric nurses, after being analyzed in three program phases was the result of the following;

Table 1:-Distribution of the study group regarding demographic data

Variable	Frequency	sd ± Mean	Percent
Age		35.5 ±.54	
20_30	33		19.5
31_40	68		40.2
41_50	54		32
51_60	14		8.3
Total	169		100
Gender			
Male	13		7.7
Female	156		92.3
Total	169		100
Years of experience			
5 years or less than	42		24.9
More than 5 years	127		74.1
Total	169		100
Education level			

Certified nurse	99	58.6
B .S.C	33	19.5
Diploma	35	20.7
M.S.C	2	1.2
Total	169	100
Years of pediatric experience		
5 years or less than	53	31.4
More than 5 years	116	68.6
Total	169	100

N= 169

Table 2:-Knowledge among nurses about different pain assessment scales in children

	Pre		Post	
	Frequency	Percentage%	Frequency	Percentage%
Yes	20	11.8	151	89.3
No	149	88.2	18	10.7
Total	169	100	169	100

The result shows a change in knowledge among nurses about different pain assessment scales in children after they received an educational program (P. value 0.00)

Paired Samples Test									
		Paired Differences					t	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
		.75148	.44696	.03438	.68360	.81936	21.857	168	.000

Table 3:-Assess the availability of pain assessment tools for measuring pain intensity in governmental pediatric hospitals in Khartoum state

	Pre		Post	
	Frequency	Percentage%	Frequency	Percentage%
Yes	14	8.3	29	17.2
No	155	91.7	140	82.8
Total	169	100	169	100

The result shows 91.7% of governmental pediatric hospitals in Khartoum state does not have pain assessment tools for measuring pain intensity before the implementation of the educational program (P. value 0.016)

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
		.08876	.47352	.03642	.01685	.16067	2.437	168	.016

Table 4:-Assessment of call nurses to uses pain assessment tool in governmental pediatric hospitals in Khartoum state

	Pre		Post	
	Frequency	Percentage%	Frequency	Percentage%
Yes	145	85.8	152	89.9
No	24	14.2	17	10.1
Total	169	100	169	100

The result shows 85.8% of call nurses use pain assessment tool after the implemented educational program and 89.9 % before the implemented educational program in governmental pediatric hospitals in Khartoum state (P. value 0.264)

Paired Samples Test								
Paired Differences					T	df	Sig. (2-tailed)	
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower Upper				
	.04142	.48002	.03692	-.03148 .11432	1.122	168	.264	

Table 5:-Assessment the Number of professional pediatric journals read monthly by nurses in governmental pediatric hospitals in Khartoum state

	Pre		Post	
	Frequency	Percentage%	Frequency	Percentage%
0	127	75.1	128	76.3
1_3	37	21.9	39	23.1
More than 3	5	3	1	.6
Total	169	100	169	100

The result shows no change of the number of professional pediatric journals read monthly by nurses in governmental pediatric hospitals in Khartoum state(P. value 0.504)

Paired Samples Test							
Paired Differences					T	Df	Sig. (2-tailed)
Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
			Lower	Upper			
.03550	.68915	.05301	-.06915	.14016	.670	168	.504

Table 6:-Assessment of learning about pain assessment and management in children during the academic year among the nurses in governmental pediatric hospitals in Khartoum state

	Pre		Post	
	Frequency	Percentage%	Frequency	Percentage%
Yes	34	20.1	38	22.5
No	135	79.9	131	77.5
Total	169	100	169	100

Result show 79 % of nurses don't teach about pain assessment and management among children during the academic year and there was no change after the educational program (P. value 0.588)

Paired Samples Test						
Paired Differences				t	df	Sig. (2-tailed)
Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference			
			Lower Upper			
.02367	.56645	.04357	-.06235 .10969	.543	168	.588

Table 7:-Knowledge among nurses about factors affecting the pain experienced among children in governmental pediatric hospitals in Khartoum state

	Pre		Post	
	Frequency	Percentage%	Frequency	Percentage%
Good	15	8.9	67	39.7
Fair	52	30.8	59	34.9
Poor	102	62.4	43	25.4
Total	169	100	169	100

The result shows a change in knowledge among nurses about factors affecting the pain experience in children. About 39.7% of nurses have good knowledge in governmental pediatric hospitals in Khartoum state. (P. value 000)

Paired Samples Test						
Paired Differences				T	Df	Sig. (2-tailed)
Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference			
			Lower Upper			
.51479	1.61874	.12452	.26897 .76062	4.134	168	.000

Table 8:-Knowledge among nurse about pain is a consideration as fifth vital signs in governmental pediatric hospitals in Khartoum state.

	Pre		Post	
	Frequency	Percentage%	Frequency	Percentage%
Good	106	63.7	154	91.1
Fair	0	0	0	0
Poor	63	37.3	15	8.9
Total	169	100	169	100

The result shows a change in of knowledge after education program among nurse in governmental pediatric hospitals in Khartoum state about 91.1 % of nurses had good knowledge about the pain that is a consideration as fifth vital signs. (P. value 0.00)

Paired Samples Test						
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Paired Differences					t	df	Sig. (2-tailed)
Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
			Lower	Upper			
.59763	1.12504	.08654	.42678	.76848	6.906	168	.000

Table 9:-knowledge among nurse about Underdeveloped Nervous system, children Under Age of Two Have Little Sensitivity To painful Stimuli and Limited Memory of Painful Experiences in governmental pediatric hospitals in Khartoum state

	Pre		Post	
	Frequency	Percentage%	Frequency	Percentage%
Good	117	69.2	75	44.4
Fair	0	0	0	0
Poor	52	30.8	94	55.6
Total	169	100	169	100

The result shows a negative change in knowledge after education program among nurse in governmental pediatric hospitals in Khartoum state about Underdeveloped Nervous system, children Under Age of Two Have Little Sensitivity To painful Stimuli and Limited Memory of Painful Experiences about 55.6 % of nurses became had poor knowledge (P. value 0.0)

Paired Samples Test							
Paired Differences					t	df	Sig. (2-tailed)
Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
			Lower	Upper			
-.48521	1.35886	.10453	-.69156	-.27885	-4.642	168	.000

Table 10:-Knowledge among nurses about the Consequences of Pain in governmental pediatric hospitals in Khartoum state

	Pre		Post	
	Frequency	Percentage%	Frequency	Percentage%
Good	20	11.8	56	33.1
Fair	28	16.6	60	35.5
Poor	121	71.6	53	31.4
Total	169	100	169	100

The result shows a change in knowledge after education program among nurse in governmental pediatric hospitals in Khartoum state about the Consequences of Pain that 35.5 % of nurses had gained fair knowledge (P. value. 000)

Paired Samples Test				
Paired Differences	t	Df	Sig. (2-	

Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				tailed)
			Lower	Upper			
.61538	1.06904	.08223	.45304	.77773	7.483	168	.000

Table 11:-Knowledge among nurses about how to Assess the pain in children from 3 to 7 years in governmental pediatric hospitals in Khartoum state

	Pre		Post	
	Frequency	Percentage%	Frequency	Percentage%
Good	4	2.1	51	30.1
Fair	39	23.1	48	28.4
Poor	126	74.6	70	41.4
Total	169	100	169	100

The result shows a change of knowledge after education program among nurse in governmental pediatric hospitals in Khartoum state regarding Assessing pain in the children from 3 - 7 years that reflect the nurses had gained good knowledge 30.1% (P. value 0.00)

Paired Samples Test							
Paired Differences					t	Df	Sig. (2-tailed)
Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
			Lower	Upper			
.60947	.95189	.07322	.46491	.75402	8.323	168	.000

Table 12:-knowledge among nurse about changes in vital signs is reliable indications of pain severity in governmental pediatric hospitals in Khartoum state

	Pre		Post	
	Frequency	Percentage%	Frequency	Percentage%
Good	132	78.1	145	85.8
Fair	0	0	0	0
Poor	37	21.9	24	14.2
Total	169	100	169	100

The result shows a change in knowledge after education program among nurse in governmental pediatric hospitals in Khartoum state regarding changes in vital signs is reliable indications of pain severity that reflects about 85.8 % of nurses had gained good knowledge (p-value 0.044).

Paired Samples Test							
Paired Differences					t	df	Sig. (2-tailed)
Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
			Lower	Upper			
.16568	1.06167	.08167	.00445	.32691	2.029	168	.044

Table 13:-Knowledge among nurses about when they should assess the pain in the children in governmental pediatric hospitals in Khartoum state

	Pre		Post	
	Frequency	Percentage%	Frequency	Percentage%
Good	10	5.9	67	39.6
Fair	17	10.1	69	40.8
Poor	142	84	33	19.5
Total	169	100	169	100

The result shows a change in knowledge after education program among nurse in governmental pediatric hospitals in Khartoum state regarding when they should assess the pain in children that reflect that about 40.8 % of nurses had gained a fair knowledge but before education program, only 10.0% of them had fair knowledge (P. value 0.00)

Paired Samples Test							
Paired Differences				t	df	Sig. (2-tailed)	
Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
			Lower	Upper			
.98225	.89624	.06894	.84614	1.11835	14.247	168	.000

Table 14:-Knowledge among nurses about The Oucher Tool to assess pain in children in governmental pediatric hospitals in Khartoum state

	Pre		Post	
	Frequency	Percentage%	Frequency	Percentage%
Good	14	8.3	150	88.8
Fair	0	0	0	0
Poor	155	91.7	19	11.3
Total	169	100	169	100

The result shows a change in knowledge after education program among nurses in governmental pediatric hospitals in Khartoum state regarding The Oucher Tool that reflects that about 88.8 % of nurses had gained good knowledge but before education program, only 8.3% of them had fair knowledge (P. value 0.00)

Paired Samples Test							
Paired Differences				t	df	Sig. (2-tailed)	
Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
			Lower	Upper			
1.65089	.74961	.05766	1.53705	1.76472	28.630	168	.000

Table 15:-knowledge among nurse about the appropriate age to use Faces pain rating scale to assess pain in children in governmental pediatric hospitals in Khartoum state

	Pre	Post
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	Frequency	Percentage%	Frequency	Percentage%
Infants & neonate	11	6.5	14	8.3
3 Years & older	9	5.3	115	68.1
8_17 Years	3	1.8	6	3.6
Not applicable	146	86.4	32	18.9
Total	169	100	169	100

The result shows a change in knowledge after education program among nurse in governmental pediatric hospitals in Khartoum state regarding appropriate age to use Faces pain rating scale to assess pain in children that reflect that nurses became known about proper appropriate age to use Faces pain rating scale by 68.1% but before education program only 5.3% had known about proper age.

(P. value 0.382)

Paired Samples Test							
Paired Differences					t	df	Sig. (2-tailed)
Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
			Lower	Upper			
-.92899	13.78430	1.06033	-3.02228	1.16429	-.876	168	.382

Table 16:-Knowledge about Numeric Rating Scale among nurse in governmental pediatric hospitals in Khartoum state

	Pre		Post	
	Frequency	Percentage%	Frequency	Percentage%
Good	20	11.8	155	91.7
Fair	0	0	0	0
Poor	149	88.2	14	8.3
Total	169	100	169	100

The result shows a change in knowledge after education program among nurse in governmental pediatric hospitals in Khartoum state regarding Numeric Rating Scale that reflects that about 91.1 % of nurses had gained good knowledge but before education program, only 11.8 % of them had fair knowledge (P. value. 000)

Paired Samples Test							
Paired Differences					t	df	Sig. (2-tailed)
Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
			Lower	Upper			
1.65680	.83842	.06449	1.52948	1.78413	25.689	168	.000

Discussion:-

In the present study most of the participant nurses were 31to 40 years old by (40.2%) and 92.3% were female table (1). Knowledge among nurses regarding how to Assess pain in children from 3_7 years (2.1%) increased to (30.1%)

in the post-test table 11 .most of Participants were certified nurse about (58.6%) table 1. The participant nurses had poor knowledge regarding when should assess the pain in children decreased from (84%) to (19.5%) post-test table 16. that may related to more than two-third participant nurses did not learned about pain assessment and management in children during academic years by (79.9%) table (6) this finding supported by A previous study suggested that nurses were not confident about their knowledge of pain management because their basic education had not adequately prepared them to provide care for patients in pain .⁽⁷⁾

In the current study, participant 74.1% of them have more than 5 years of pediatric nursing experiences. According to the table (1) two-thirds of the participant nurses pretest have good knowledge by (78.1%), regarding Changes in vital signs is reliable indications of pain severity and increase post-test to (85.8%) table (12).

Regarding the availability of pain assessment tools for measuring pain intensity in governmental pediatric hospitals in Khartoum state about (91.7%) does not have tools according to the table (3). In spite of this most of participant's nurses have a desire to use pain assessment tool about (85.8%) pretest and increase to (89.9%) post-test table (4). That may be the reason of known participants about different pain assessment scales in children by (11.8%) only but pretest known by most of them (89.3%) table (2), so knowledge among participant nurses about The Oucher Tool to assess pain in children is good by (8.3%) pretest and increased to (88.8%) pretest table (14). Also, pretest only (5.3%) of participant nurses had known correctly about appropriate age to use Faces pain rating scale to assess pain in children and post-test about (68.1%) of them became known about it correctly table (15). In addition to this little of the participant, the nurse has good knowledge about Numeric Rating Scale by (11.8%) pretest and increased to (91.7%) post-test table (16). All these variables differed positively before and after the test (P. value 0.00). This finding was supported by a quasi-experimental study. The purpose of this study was to develop, implement, and evaluate the impact of a Pain Education Program (PEP) for nurses in China. Their scores on the Nurses' Knowledge and Attitude Survey increased from pre to post (PEP. The percentage of nurses who correctly used the chaighai Pain Scale to assess patients' pain intensity increased significantly after the PEP. The PEP has been demonstrated to be effective in improving nurses' pain.

In this study (75.1%) of the participant nurses did not update themselves at all, and that they did not read the professional pediatric journals table (5), so (63.7%) know the pain is considered as fifth vital signs pretest increased to (91.1%) post-test table (8), even though the documentation of pain assessment is now as prominent as the documentation of the “traditional” vital signs. Calling pain the fifth vital sign suggests that the assessment of pain should be as automatic as taking a patient's blood pressure and pulse. ⁽⁸⁾

The participant nurses have poor knowledge about the Consequences of pain in children by (71.6%) pretest. Regarding post-test, the participant nurses decrease poor knowledge to (31.4%) (P. value. 000) that indicator of the efficacy of education program (table 10). This finding is supported by the study by Gentili A, Mastrolia A, Lima M, Baroncini S. named a pain educational program for pediatric nurses authors planned an educational program devoted to pediatric nurses. The concept of brain and of cognitive development, the methodological bases of the pain measurement and the cognition of long-term consequences on pain have been the key points of the program. The course was efficacious and highly appreciated by nurses. The improvement of practice standards will be the true indicator of its efficacy ⁽⁹⁾

In the present study, participant nurses have poor knowledge about the factors affecting the pain experienced in children by (62.4%) pretest and decrease to (25.4%) that mean positive change in knowledge significant (P. value. 000) table (7), also have poor knowledge about underdeveloped nervous system, children under the age of two have little sensitivity to painful stimuli and limited memory of painful experiences by (30.8%) pretest professional training programs regarding pain management are required to enhance a better understanding of the usefulness and application of pain assessment. ⁽¹⁰⁾

The previous study reflected that a remarkable improvement in nursing adhere to regular pain assessment after the program had occurred. The number of pain assessment sheet used for hospitalized patients had increased from 10% to 92% over eight months of observation. This means that nurses become habitually committed to the pain assessment ⁽¹¹⁾ this result supports the premise that improving nurses' attitude to pain assessment would eventually improve the adherence to pain assessment skillfully. ⁽¹²⁾

Conclusion:-

The deficits in pain assessment can be improved by implementing pain education programs. Nurses scored low in having knowledge and attitudes towards pain prior to pain education; whereas, a significant improvement in their knowledge and attitude after the delivery of pain education was explicit. Governmental pediatric hospitals in Khartoum state do not have pain assessment tools.

Recommendations:

Recommendations that are achieved after this study are summarized as the following points:

1. to increase in the number of qualified nurses in governmental pediatric hospitals in Khartoum state, Sudan.
2. Emphasize on pain assessment knowledge and skills in Nursing Institutes Curriculum for nursing students .
3. Provide pain assessment tools and nurses should be educated and demonstrated on the use of the educational program in governmental pediatric hospitals in Khartoum state .
4. Professional training and follow-ups for nurses working in the clinical field to be introduced and to update pain assessment.

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