Nurses' Knowledge and Attitude towards Pediatrics' Pain Management in Jordan

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Abstract : unrelieved pain among hospitalized children is a worldwide phenomenon that has been addressed by researchers for decades as a cause of suffering and decreased quality of life. Scientists' understanding of pain has been improved significantly in terms of its physiology and causes, accompanied with advancement in its treatment methods. But despite that, it is still reported globally that pain in children is undertreated, causing them unnecessary suffering. Nurses play an essential role in children's pain management process, as they provide care to them. Hence, nurses should be knowledgeable, competent and efficient in pediatrics pain assessment and management. The aim of this study was to determine pediatric nurse's level in knowledge and attitudes towards pediatric pain management in Jordan. The tool used to achieve the study aim was the Pediatric Nurses Knowledge and Attitude Survey (PNKAS). The study was done in four hospitals in Amman, the capital city of Jordan. Data analysis was done using descriptive statistics and ANOVA test. In this study, the average age of participants was 30.48 years (SD 6.35). 94 percent of participants were females. Total nursing experience ranged from five months to 26 years. Experience in pediatric units ranged from five months to 23 year. 87 percent of nurses had bachelor degree, 8.1 percent had diploma, and 4.9 percent had master degree. The majority of nurses (78.3 %) declared no attendance of any sort of continuous education related to pain management, 6.5 percent mentioned that they have attended conferences, and 15.2 percent have attended courses. The total mean score achieved by the study participants on the PNKAS was 45.3 percent, the median was 45 percent, SD 9.52. Scores ranged from 22.5 percent to 67.5 percent. The result of the current study revealed that the level of knowledge and attitude towards pediatric pain management for pediatric nurses in Jordan is low and far from satisfactory. More education related to pediatrics pain management in formal nursing education and in hospitals is recommended

IndexTerms **- Pain: an unpleasant sensory and emotional experience associated with actual or potential tissue damage, Knowledge: understanding of or information about a subject that you get by experience or study, Attitude: a feeling or opinion about something or someone or a way of behaving that is caused by this, PNKAS: pediatric nurses knowledge and attitudes survey regarding pain management.**

1. Introduction

Moderate to severe pain was experienced by 30 – 60 percent of children patients at some point during their hospitalization of acute or chronic type [1][2][3]. Access to pain management is considered a fundamental human right [4]. International organizations declared the necessity of establishing policies that enforce assessment of patient's pain level on regular basis as the fifth vital sign, taking in consideration that it is a fundamental indicator of the patient's health status and wellbeing [5]. Even with international efforts and initiatives that carried out to introduce protocols for optimal pain management and standards for clinical treatment, pain under treatment is still reported and lack of pain management knowledge among health care providers is one of the essential reasons [6][7][8]. Even though nurses are not permitted to prescribe pain medicines they can contribute greatly in the early assessment and management of pain with continuous monitoring and evaluation [9]. Hence, nurses must be knowledgeable in how to better assess and manage children's pain, however several studies indicated deficit in pain knowledge and negative attitude among pediatric nurses as one of the important problems and barriers that hinders effective pain management for children [10][11][12].

Pediatrics pain management is not exactly the same as adults, pediatrics pain management require more precise knowledge related to this stage of life, medication dosing to pediatrics is quite challenging due to physiological variances between adult and children [13]. Studies conducted in many countries have declared poor knowledge and attitude among pediatric nurses in pain management, for example In Turkey, the mean score for pediatric nurses' pain management knowledge and attitude questionnaire was 38.2%. In India the average correct response rate for pain knowledge was 48.67%, which was unsatisfactory, and these studies emphasized on the importance of collaboration between countries in pediatric pain management and the need to initiate partnership to participate in collaborative projects in this topic, with the necessity of developing guidelines for pediatric pain management for the nurses in pediatric practice area [10][11][12].

Despite the significance of this topic, it is still not clear if Jordanian pediatric nurses are specially trained and well equipped with the required knowledge and attitude related to managing pediatrics pain. Several studies done in Jordan explored nurse's knowledge and attitude among nurses regarding pain management such as [14][15][16]. But neither one of these studies has

addressed pediatrics nurses as its main focus, there is no emphasis on pediatric patients pain management as it has for adults. Hence in Jordan there is a scarcity of information regarding pediatrics nurses knowledge about children's pain management. Therefore this study comes to determine the level of knowledge and attitude regarding effective pediatric' pain management for nurses working at pediatric units in Jordan.

2. Methods

This study used a quantitative, descriptive, cross-sectional design through self-report questionnaire as a data collection method. The population in this study is: nurses who are working in pediatrics wards, pediatric intensive care units and neonatal intensive care units, from four hospitals in Amman, Jordan. Two hospitals were from the private health care sector and two hospitals were from the public health care sector, the study decided to include hospitals form both the public and private sectors to obtain adequate and representative sample. Hospitals were randomly selected among the private and public hospitals in Amman. Names of all private and public hospitals in Amman were written on papers and blindly four of them were selected. These four hospitals serve the community in Amman and patients from across Jordan as well. A total of two hundreds and ninety questionnaires were distributed in the four hospitals, a total number of 210 nurses have participated and returned their questionnaires, after receiving the questionnaires, they were carefully scrutinized for any missing data, 26 of them were incomplete and not usable, hence, a total of 184 nurses returned usable responses. This represents a response rate of 63.4 percent.

The instrument used for this study to obtain data was a self report questionnaire consists of two parts: 1) demographic profile sheet; In this sheet, the participants have to write their demographic data such as their age, gender, educational back ground, number of years of experience and they were asked to mention any pain management education attended post graduation with emphasis of providing the attended pain education length. 2) The Pediatric Nurses' Knowledge and Attitudes Survey Regarding Pain (PNKAS): A self-administered questionnaire with overall of 38-items, 20 questions with true or false answers. 14 questions with multiple choice answers and two case studies followed with two questions for each case. The Pediatric Nurses' Knowledge and Attitudes Survey Regarding Pain (PNKAS) is a modification from a well validated knowledge and attitude survey regarding pain (KASRP) developed by Ferrell and McCaffery in 1987. KARSP has been used extensively for years; it has been revised over the years to reflect alterations in pain management practice [17]. KARSP then was modified by Manworren in 2001 to test pediatric nurses, then it was revised and rated by five national content experts in pain management in the United States to establish content validity, the survey has acceptable level of stability with a test – retest reliability result r =0.67, internal consistency level was acceptable with Cronbach's alpha 0.72 [18]. The original English form of PNKAS was used as English is the language of teaching in nursing faculties in Jordan.

The researcher obtained ethical approval from the faculty board in University Sultan Zainal Abidin to conduct the proposed study and recruit participants for the research, also the researcher has obtained approvals from the Institutional Review Boards (IRB) in the selected hospitals, as well from the ministry of health in Jordan. The voluntarily nature of participation in the study was mentioned in the questionnaire cover paper with emphasis that participants have the choice to withdraw at any time. The confidentiality of the participant's information was assured.

3. Data Analysis

Questionnaires and all data entered were checked thoroughly to detect any missing data or input errors and prepared for analysis. Data collected was entered into the statistical package for social sciences (spss) version 23. Data analysis performed consisted of defining the characteristics of the participants' answers with descriptive Statistics such as means, frequencies, percentages, standard deviations and ranges of variables. ANOVA test was used to determine the relationship between level of knowledge and attitude towards pediatrics pain management with nurse's educational levels, number of years of experience and attendance of pain education.

4. Results

As illustrated in table 1, female nurses were representing 94 percent of the sample with n = 173, and 11 male (6%). The mean age of participants was (M = 30.48, SD = 6.356), age ranged from 22 years to 48 years, 58.7 percent (n = 108) of nurses were below 30 years of age, 28.3 percent (n = 52) were between the ages of 30 and 39 years, 13 percent (n = 24) between the ages of 40 to 49, no nurse was above 50 years old.

Table 1: Demographic data of participants

)c((haracteristic	Group	Frequency	%percentage
Gender	Male	11	**6 %**
	Female	173	**94 %**

Age (Years)	20 – 29	108	**58.7%**
	30 – 39	52	**28.3%**
	40 – 49	24	**13%**
	50 +	0	**0%**
Level of Education	Diploma	15	**8.1 %**
	Bachelor	160	**87 %**
	Master	9	**4.9 %**
Total Work Experience (Years)	<1	20	**10.9 %**
	1 – 5	68	**37 %**
	6 – 10	48	**26.1 %**
	11 – 15	20	**10.9 %**
	16 – 20	16	**8.7 %**
	21-25	8	**4.3 %**
	>25	4	**2.2 %**
Experience in pediatric area(years)	<1	28	**15.2 %**
	1 – 5	80	**43,5 %**
	6 – 10	40	**21.7 %**
	11 – 15	20	**10.9 %**
	16 – 20	12	**6.5 %**
	21-25	4	**2.2 %**
	>25	0	**0 %**
pain education	conferences	12	**6.5%**
	courses	28	**15.2%**
	no attendance	144	**78.3%**

Total experience in nursing ranged from 5 months to 26 years, the mean number of years of experience was (M = 7.50, SD = 6.635), 20 nurses (10.9%) had less than one year of experience, about one third (37%, n = 68) of the participants had from 1 to 5 years of nursing experience, almost quarter of nurses 26.1 percent (n = 48) had from 6 to 10 years of experience, the lowest proportion was for nurses with more than 25 years of experience with 2.2 percent (n=4). Experience in pediatric area ranged from 5 months to 23 years (M = 5.53, SD = 5.21), more than half of nurses (n = 108, 58.7 %) had no more than 5 years of experience in pediatric units.

In terms of highest educational level obtained by participants, the majority of nurses 87 percent (n=160) had bachelor degrees, followed by 8.1 percent (n=15) had diplomas and the least percentage was for master degree holders with 4.9 percent (n=9).

Participants were asked if they have participated in any form of education related to pain management like conferences or courses and the majority of nurses 78.3 percent (n =144) recorded no attendance of any sort of continuous education related to pain management, 6.5 percent (n = 12) of nurses mentioned that they have attended conferences, and 15.2 percent (n = 28) attended courses.

The PNKAS questionnaire was designed to test pediatric nurses' knowledge and attitudes regarding principles of pain assessment and management, pharmacology, tolerance and addiction. The mean score of correct answers to the knowledge and attitude towards pediatric pain management survey PNKAS was 45.3 percent, the median was 45 percent, and the standard deviation was 9.52. Scores ranged from 22.5 percent to 67.5 percent. The largest proportion of participants 32.6 percent (n = 60) have achieved scores ranged from 50 percent – 59 percent. The satisfactory level of the survey is 80 percent [19]. Ten questions with the highest correct answers and lowest correct answers are presented in tables 2 and 3 respectively.

Table 2: Ten questions with the highest correct answers.

Ranking	PNKAS Question number	Frequency	Percentage
1	Q 22 After the initial recommended dose of opioid analgesic, subsequent doses should be adjusted in accordance with the individual patient's response.	168	**91.3 %**
2	Q 5 Comparable stimuli in different people produce the same intensity of pain	155	**84.2 %**
3	Q 32 The most likely explanation for why a child/ adolescent with pain would request increased doses of pain medication is	148	**80.4 %**
4	Q 8 Children who will require repeated painful procedures (i.e. daily wound care or blood draws), should receive maximum treatment for the pain and anxiety of the first procedure to minimize the development of anticipatory anxiety before subsequent procedures.	143	**77.7 %**
5	Q 17. Young infants, less than 6 months of age, cannot tolerate opioids for pain relief.	132	**71.7 %**
6	Q 26. The recommended route of administration of opioid analgesics to children with brief, severe pain of sudden onset, e.g. trauma or postoperative pain, is	124	**67.39%**
7	Q 29 Analgesics for post-operative pain should initially be given	119	**64.67%**
8	Q 2 Because of an underdeveloped neurological system, children under 2 years of age have decreased pain sensitivity and limited memory of painful experiences.	107	**58.15%**
9	Q 27 Which of the following analgesic medications is considered the drug of choice for the treatment of prolonged moderate to severe pain for children?	105	**57.06%**
10	Q 15 Adolescents with a history of substance abuse should not be given opioids for pain because they are at high risk for repeated addiction.	104	**56.52%**

Table 3: Ten questions with the lowest correct answers.

Ranking	PNKAS question Number	frequency	percentage
1	Q 35 What do you think is the percentage of patients who over report the amount of pain they have?	11	**5.9 %**
2	Q 37 b. Case study: He has identified 2 as an acceptable level of pain relief. His physician's order for analgesia is "morphine IV 1-3 mg q1h PRN pain relief." Check the action you will take at this time	19	**10.3%**
3	Q 1. Observable changes in vital signs must be relied upon to verify a child's/ adolescent's statement that he has severe pain.	23	**12.5%**
4	Q 7. Non-drug interventions (e.g. heat, music, imagery, etc.) are very effective for mild, moderate pain control but are not helpful for more severe pain.	31	**16.8%**
5	Q 25 .The recommended route of administration of opioid analgesics to children with background (continuous, persistent) pain is	35	**19.0%**
6	Q 38 b. Case study: He has identified 2 as an acceptable level of pain relief. His physician's order for analgesia is "morphine IV 1-3 mg q1h PRN pain relief." Check the action you will take at this time:	47	**25.54 %**
7	Q 36 Using this definition, how likely is it that opioid addiction will occur as a result if treating pain with opioid analgesics?	47	**25.54%**
8	Q 4 Infants/ children/ adolescents may sleep in spite of severe pain.	48	**26.08%**
9	Q 30 A child with background (continuous, persistent) pain has been receiving daily opioid analgesics for 2 months. The doses increased during this time period. Yesterday the child was receiving morphine 20 mg/hour intravenously. Today he has been receiving 25 mg/hour intravenously for 3 hours. The likelihood of the child developing clinically significant respiratory depression is	59	**32.06%**

10	Q 12 The usual duration of analgesia of Morphine IV is 4-5 hours.	67	**36.41%**

The mean scores for nurses from the different nursing experience groups were compared and it showed that the mean scores for nurses with experience range of 21-25 years were the highest (M = 51.25) followed by mean scores for nurses with nursing experience range of 10-20 years (M = 47.65). Mean scores for nurses with experience ranges above 25 years (M = 39.37) and below one year (M = 41.12) were the lowest. The p- value was .136 which was non-significant, and indicated no significant effect of total nursing work experience on the scores. The current study differentiated between nurses overall experience in hospitals and their experience in pediatric units. The mean scores for nurses for the pediatric experience groups were compared and it showed that the mean scores for nurses with pediatric experience ranged from 21-25 years (M =60.62) were the highest followed by mean scores for nurses with pediatric experience range 11-15 years (M = 49.75). Mean scores for nurses with pediatric experience range from 1 – 5 years were the lowest (M = 43.12), as demonstrated in Table 4, the p- value was <.001 , which was significant, and indicated significant effect of pediatric experience on the scores. The mean scores for nurses with pediatric experience range from 21-25 years (M = 60.62) was statistically significantly higher than mean scores for nurses with pediatric experience ranged from 1-5 years (M=43.12, p value: .020) and less than one year (M=43.57, p value: .039). No statistically significant difference in mean scores between other ranges was found as per Figure 1. Hence, pediatric experience showed significant effect on scores according to this study findings, these results contradict with a study done in turkey, which revealed that nurses with the lowest experience have scored the highest and more experienced nurses have achieved the lowest scores [10].

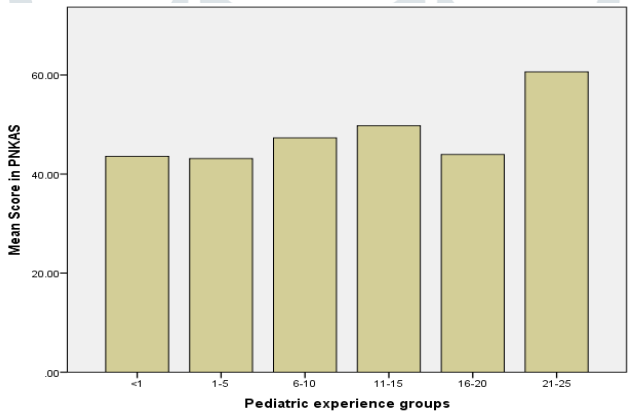

Figure 1: Correct answers percentage for the different pediatric experience ranges.

The mean scores for the three educational levels (Diploma, Bsc and Master) were compared and it showed that the mean scores for the nurses with master degrees (M=47.50) were higher than those for nurses with bachelor degrees (M = 45.39) and diploma (M = 42.50), with relatively closer scores between bachelor degree and master degree holders in favor of bachelor degree holders. However, no significant difference found on the mean of correct answers with respect to different educational levels for participants, the p- value was .422. These results compared to results of the study accomplished in turkey is almost similar, where the Turkish bachelor and master degree holders scores were higher than those for associate degree and diploma holders, but the only difference is that Turkish bachelor degree holders scored higher than those of master degree holders [10].

In terms of participation in education related to pain management, this study findings showed that the mean scores for nurses who attended conference (M= 55.41) was the highest followed by mean scores for nurses who mentioned courses attendance (M = 49.73). Mean scores for nurses with no pain education attendance of any sort were the lowest (M = 43.54). The p-value was <.001 which was significant, and indicated a significant effect of pain education on scores. The mean score for nurses who did not attend any form of pain education was significantly lower than the mean score for nurses who attended conferences (P value <.001) or courses (p value = .005) with no significant difference in mean scores between nurses who attended courses and conferences. This result is consistent with other study who examined the relation between pain management level and providing pain education to pediatric nurses [12].

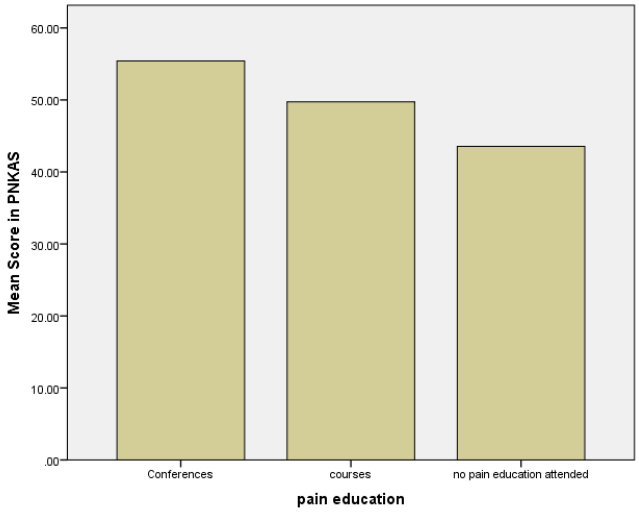

Figure 2: Correct answers percentages for the different pain education categories.

5. Discussion

The mean correct score for the PNKAS was 45.3 percent, provided that the satisfactory level is 80 percent, it was noticed that if nurses score less than this result, their ability to manage patients experiencing pain was compromised significantly [19]. The majority of the scores (80.5 percent) were between 30 to 59 percent. On individual basis, no one of the participants could achieve the satisfactory level of 80 percent; the highest mark achieved was 71.1 percent, this indicated that all participants have failed to reach the satisfactory knowledge level of the survey [19]. The overall score of PNKAS of the current study compares well with results obtained from similar studies announced in other countries, a remarkable low level of pediatric nurses in knowledge and attitude regarding pain management was declared in a Turkish study with a mean score of 38.2 percent, the highest score achieved was 65 percent and the lowest was 15 percent [10]. A closer result to the current study was declared in a study conducted in India were nurses in pediatrics ward, Neonatal Intensive Care Unit (NICU) and Pediatric Intensive Care Unit (PICU) achieved a mean total score of 49.67 [11]. In Mongolia they conducted the same study two times, pre and post educational course and in the two surveys, they had a low mean score of 26.4 percent in the pre-test survey and 47.8 percent in the post test survey [12]. In a local scale, results of this study supports the results from previous studies took place in Jordanian hospitals, these studies have announced that level of knowledge and attitude towards pain management for nurses in Jordan is generally low and not satisfactory [14][15][16].

The least correctly answered question in this survey was related to what nurses believe is the percentage of patients who over report the amount of their pain, only 11 nurses (5.9 percent) of the participants answered this question correctly, a similar study done in Mexico declared a low level of correct answers to this question but compared to the result of the current study, Mexican nurses scored much better response to this question with 54 percent of participants answered correctly [20]. For around 64 percent of nurses participated in this study, fear of addiction was not a major factor that leads to hesitation in giving opioids to children, even if there is a history of substance abuse, which is a correct perception, and this percentage of correct answers to this question reflects that fear of addiction by children is not that prevalent among pediatric nurses in Jordan. Furthermore, 80 percent of nurses explained correctly that a request of opioids dose increment is due to increased pain not due to addiction, these finding contradicts with results from other similar studies which announced that fear of addiction is one of the most common factors that leads to hesitation for giving opioids to patients specially if there is a history of addiction [10][11]. Some questions related to knowledge concerning opioids administration for infants was noticeably answered correctly, 91.3 percent of nurses knew that after the initial recommended dose of opioids, the subsequent dose should be adjusted according to the individual patient's response, they know that our body reacts differently to opioids, and accordingly some people may need more or less subsequent dose. This finding opposes with result from a study done in India where deciding the subsequent dose of opioids and infants ability to sleep despite severe pain were from the highest questions wrongfully answered [11].

6. Conclusion

The result of this survey revealed low level of nurses' knowledge and attitude towards pediatrics' pain management in Jordan, such low level indicates the need for improvement in education and training related to pain management. Nurses have an

important task of enhancing their knowledge and performance in pain management through the involvement in more pain management education forms such as lectures and conferences or practice self study through utilizing printed or web based resources, this could make a big difference in the pediatrics' patient pain experience by providing pain management that is appropriate, updated and accurate. Nursing managements in hospitals as well may benefit from the results of this study to plan for more comprehensive, constant and updated in-hospitals pain education programs for nurses and other health care providers as well, to improve their knowledge and attitude towards pain management. Forming a pain management team that use updated international pain management protocols for pain assessment and management should be in consideration as it provides an extremely useful reference for nurses. Faculty members could consider revising their teaching plans; they may consider alterations in the teaching curricula's by increasing number of hours devoted to pain assessment and management.

According to our knowledge, this is the first study in Jordan that has addressed pain management knowledge for nurses who work in the pediatric area. The results will represent a useful reference for researchers in Jordan and the region who are interested in pediatric pain management in particular and pain management in general, it has aimed to contribute along with the previous studies to widen the base of knowledge in Jordan that decision makers, academic institutions and clinical professionals in hospitals rely upon to enhance the nursing practice related to pain management. Future research may have to focus on ways and methods for designing a strategy to improve the declared present poor level of pain management performance among nurses in Jordan, a strategy that will lead into meeting the international standards for pain management.

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