Impact of applying brief educational program on nurses knowledge, attitude, and practices toward pain management

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Abstract

Background: The role of pain education is well established in improving knowledge and attitude towards the adherence to pain assessment and management.

Methods: A brief pain education program was delivered to assess nurses' knowledge and attitude towards pain assessment and management. The "KASRP" scale was used at three phases; pre, post, and three months' follow-up phases. Subsequent eight months observation on using pain assessment sheets was also performed.

Results: One hundred and four nurses were assessed at the beginning, followed by 92 at the immediate post-test, and 70 at the follow-up. Although nurses scored lowest in having knowledge and attitudes prior to the program, a significant improvement was evident after delivering pain education. In addition, nurses' competency in pain assessment was maintained over the three months of assessment. Younger nurses with shorter clinical experience were found more reactive to the program than older nurses.

Conclusions: A brief nurse-driven pain education has improved nurses' knowledge and attitude towards pain management.

Keywords: *Attitudes; Knowledge; KASRP; Nurses; Pain Education.*

1. Introduction

Pain is an inherently subjective symptom which is frequently experienced in the acute illnesses and is one of the symptoms that patients dread from (Jain, Yeluri et al. 2012). Undertaking pain management aims to avoid negative physiological and psychological consequences (Twycross 2007). As pain assessment is a responsibility of nurses, nurses are required to use the appropriate assessment measures and intervene accordingly (Kastrup, von Dossow et al. 2009). Untreated pain may result in multi-system complications and the development of chronic unrelenting pain leading to impaired body functioning, disturbed quality of life and well-being (Kehlet, Jensen et al. 2006; Dunwoody, Krenzischek et al. 2008). Many patients experience significant pain during hospitalization. For example, more than 30% of ICU patients suffer from pain at rest, and more than 50% complain from pain during routine care, such as changing position, endotracheal suctioning, and wound care (Puntillo, White et al. 2001; Chanques, Sebbane et al. 2007).

Lack of knowledge about pain and its features is a common barrier to effective pain management (Ware, Bruckenthal et al. 2011). Ineffective pain managements by nurses and nurses' reluctance to embrace all dimensions regarding pain is problematic (Hirsh, Jensen et al. 2010). For instance, nurses were found had inadequate knowledge about opioid analgesic drugs (Schafheutle, Cantrill et al. 2001). They may develop different attitudes towards pain, thereby, they may subjectively judge the level of a patient's pain based on rituals or personal opinion (Schafheutle, Cantrill et al. 2001). Since most of the pain is undetectable, the use of these unreliable indicators may add complexity to pain assessment (Ware, Bruckenthal et al. 2011). This situation creates further challenge to nurses who need to consider other alternatives for pain management (Herr, Coyne et al. 2011; Fraser, Devlin et al. 2013).

There is an increasing demand on understanding patient's perception and reactions to pain along with understanding factors triggering, aggravating, and alleviating the intensity of experiencing pain (Apfelbaum, Chen et al. 2003). Nursing curriculums are criticized to have inadequate components of pain assessment and management which in eventual leads to ineffective nursing knowledge and performance (Abed El-Rahman, Kalaldeh et al. 2013).

This study aimed to assess the impact of a brief nurse-centered pain education program on nurses' knowledge and attitude towards pain assessment and pain management in the hospitalized patients.

2. Methodology

This pretest-posttest study measured changes in nurses' knowledge and attitudes towards pain assessment and management before and after the delivery of a brief pain education. Nurses working in Ma`an Governmental Hospital, in the south of Jordan were the study participants. Eligibility criteria included all nurses who provide bedsides care whether in the medical or surgical wards, and have a clinical experience more than six months. The number of nurses who were found eligible for participation was 153 nurses. Pain education was delivered by the first researcher (SA) who holds the doctoral degree in nursing and a specialty of pain education. The study assessed nurses' knowledge and attitudes towards

pain as follows: before the intervention, immediately after the intervention, and three months follow-up after the intervention using a self-administered questionnaire. Data collection carried out in the period between April 2013 and July 2013. Ethical approval was obtained from Jordanian Ministry of Health and the hospital administrator. Participants' consent was obtained at the early stage of the study including the steps of ensuring confidentiality and anonymity. A pilot study was carried out on ten nurses prior to data collection to assess the clarity of the study instruments.

3. Instruments

A self-administered questionnaire was designed to include the following elements:
1) Personal demographic data including past experience of pain management.
2) Nurses' Knowledge and Attitudes Survey Regarding Pain (KASRP) (Betty Ferrell revised 2012.). Some items of the KASRP were removed from this study according to their relevance to nursing practice in Jordan. The scale used consisted of the following components: pain knowledge and attitude (15 items), pain assessment (eight items), and pain intervention (two case studies). Items related to knowledge and attitude were scored true or false, while items related to pain assessment and pain intervention were multiple-choice questions. The total score of attitude and knowledge scale ranged from 0-30, in which scores above 20 indicate good knowledge and attitudes toward pain and scores below 15 indicate poor knowledge and attitudes. This instrument was already checked for validity and reliability (Test-retest reliability: r>.80) and was used in different context successfully (alpha r>.70) (Betty Ferrell revised 2012.). The time estimated for completing the study instruments was 15–20 minutes.
3) The last source of data included counting the number of pain assessment charts used in this hospital over duration of eight months starting from the beginning of the study (from April 2013 to February 2014). The number of pain assessment sheets used was compared to the number of admitted patients in this hospital month-by-month.

4. Pain education program

This brief pain education program included five hours interactive learning session directed towards nurses who are working in Ma`an Governmental Hospital. The program consisted of a formal lecture and group discussions about pain assessment and pain management assisted by case studies. Materials and case studies were taken from "PainEDU Manual" (4th edition, 2010) which is a comprehensive pain resource form heath care providers (16). After the session, short videos of adult and pediatric scenarios about pain managements were also provided. To ensure maximum benefits, a practice on pain assessment was performed on selected case studies and discussed later within the group. Nurses participated in the program were divided into three groups at different times according to their convenience. At the end of the session, each participant was given a notebook which included all information, guidelines, and practices delivered in the program.

5. Data analysis

Data was entered into the Statistical Package for Social Science (SPSS) software (version 17). Both descriptive and inferential statistics were used to describe data into categories, identify differences in the level of knowledge and attitude at different study phases. Factors affecting nursing knowledge and attitudes towards pain management were also explored. Chi-square, t-test, and the analysis of variance (ANOVA) were used to find differences. The

multiple-hierarchal regression was used to assess factors affecting knowledge and attitude towards pain management.

6. Results

6.1. Participants' demographics

One hundred and four nurses participated in the study. This number has changed over the study duration to be 92 participants at the post-test and 70 participants at the follow-up phase considering 11.5% and 32.5% attrition rates, respectively. Table 1 shows the demographic characteristics of participants at the pre-test phase of the study. The majority of participants (72.1%) aged between 18-28 years old and 64.4% of them were female nurses while 35.6% were male nurses. It was also evident that the majority hold the bachelor degree of nursing (91.3%) and most of them (74.0%) had clinical experience less than one year. All participants claimed no pain training received previously (Table 1).

Table 1: Participants' Demographic Data

Variable		Frequency	Percent %	P value
Age	18-28 years	75	72.1%	
	29-35 years	25	24.0%	<0.001
	36-42 years	4	3.9%	
	Total	104	100%	
Sex	Male	37	35.6%	0.003
	Female	67	64.4%	
	Total	104	100%	
Professional Degree	Registered nurse	95	91.3%	
	Associate nurse	8	7.7%	<0.001
	Assistant nurse	1	1%	
	Total	104	100%	
Experience	< 1 year	77	74.0%	
	1-3 years	34	23.1%	<0.001
	4-7 years	3	2.9%	
	Total	104	100%	
Previous Pain Management Training	Yes	0	0%	
	No	104	100%	
	Total	104	100%	

6.2. Assessment of knowledge and attitude to pain

Table 2 shows results of nurses' knowledge and attitudes to pain which includes the percentages of nurses who selected the correct answers. All knowledge and attitude queries were reported at the three phases of the study. As shown in the table, nurses showed low scores of knowledge and attitudes at the pre-test phase. In the immediate post-test assessment, nurses showed a significant improvement in their knowledge and attitudes towards pain as appeared in the all listed questions. However, these scores declined slightly after three months of program follow-up although the percentages of corrected answers in this phase were still significantly higher than those in the early stage.

Similarly, nurses showed improvements in pain assessment tasks likewise the previous section. Table 3 shows the results of multiple choice questions and case studies regarding pain assessment. It was apparent that nurses' responses to all questions in the pre-test phase was at the lowest scores compared to the significant higher scores in the post-test and follow-up. However, all responses were not significantly retracted at the follow-up phase.

Table 2: Assessing Knowledge and Attitude towards Pain

	Questions (Percentages are based on the correct answers)	Pre-test (n=104)	Post-test (n=92)	Follow-up (n=70)	Sig.
1	Vital signs are always reliable indicators of the intensity of a patient's pain.	10.6%	95.6%	49.0%	<0.001
2	Because their nervous system is underdeveloped, children under two years of age have decreased pain sensitivity and limited memory of painful experiences.	43.3%	76.0%	53.8%	<0.001
3	Patients who can be distracted from pain usually do not have severe pain.	10.6%	71.2%	57.7%	<0.001
4	Patients may sleep in spite of severe pain.	40.4%	79.8%	63.5%	<0.001
5	Respiratory depression rarely occurs in patients who have been receiving stable doses of opioids over a period of months.	38.5%	74.0%	58.7%	<0.001
6	Combining analgesics that work by different mechanisms (e.g., combining an NSAID with an opioid) may result in better pain control with fewer side effects than using a single analgesic agent.	41.3%	66.3%	54.8%	<0.001
7	The usual duration of analgesia of 1-2 mg morphine IV is 4-5 hours.	10.6%	79.8%	58.7%	<0.001
8	Opioids should not be used in patients with a history of substance abuse.	39.4%	72.1%	53.8%	<0.001
9	There is a specific dosage for Morphine, if exceeds, the medication is no longer to be effective.	51.0%	81.7%	61.5%	<0.001
10	Elderly patients cannot tolerate opioids for pain relief.	44.2%	76.0%	57.7%	<0.001
11	Patients should be encouraged to endure as much pain as possible before using an opioid.	7.7%	65.4%	55.8%	<0.001
12	Children less than 11 years old cannot reliably report pain so clinicians should rely solely on the parent's assessment of the child's pain intensity.	8.7%	71.2%	52.9%	<0.001
13	After an initial dose of opioid analgesic is given, subsequent doses should be adjusted in accordance with the individual patient's response.	30.8%	88.5%	64.4%	<0.001
14	Giving patients sterile water by injection (placebo) is a useful test to determine if the pain is real.	39.4%	80.8%	60.6%	<0.001
15	If the source of pain is unknown, opioids should not be used during the pain evaluation period, as this could mask the ability to diagnose the cause of pain.	7.7%	71.2%	57.7%	<0.001

Table 3: Assessing Pain Knowledge Using Case Studies and Questions

	Questions (Percentages are based on the correct answers)	Pre-test (n=104)	Post-test (n=92)	Follow-up (n=70)	Sig.
1	MCQ1: The recommended route of administration of opioid analgesics immediately after surgery.	56.7%	82.7%	58.7%	<0.001
2	MCQ2: The IV doses of morphine that would be equivalent to 30 mg of oral morphine.	11.5%	78.8%	55.8%	<0.001
3	MCQ3: Time to initial analgesics administration for post-operative pain.	7.7%	79.8%	59.6%	<0.001
4	MCQ4: Reason a patient with pain would request increased doses of pain medication.	34.6%	82.7%	61.5%	<0.001
5	MCQ5: The source of the most accurate judge of the intensity of pain.	27.9%	85.6%	62.5%	<0.001
6	MCQ6: The time to peak effect for morphine given IV.	5.8%	79.8%	63.5%	<0.001
7	MCQ7: The time to peak effect for morphine given orally.	8.7%	79.8%	59.6%	<0.001
8	MCQ8: Manifestation of physical dependence Following abrupt discontinuation of an opioid.	20.2%	81.7%	62.5%	<0.001
9	Case study 1: assessment of pain level	12.5%	81.7%	62.5%	<0.001
10	Case study 2: assessment of pain level	8.7%	82.7%	59.6%	<0.001

The total score of pain knowledge and attitude scale was calculated (Table 4). Chronbach's Alpa of the pre-test, post-test, and follow-up revealed acceptable values (0.78, 0.51, and 0.59, respectively). Mean of total score at the pre-test was low (6.25) compared to 21.80 at the immediate post-test and 20.79 at the follow-up. Therefore, a statistical significant difference between pre-test and post-test scores was noted (p<0.001) while no significant difference in means between post-test and follow-up scores (p=0.667).

Table 4: Total Pain Assessment Score

Total score (Range: 0-25)	Number	Mean	SD	t	df	95% Confidence Interval (CI)	Sig
Pre-test	104	6.25	4.14	33.172	91	14.62-16.49	<0.001
Post-test	92	21.80	1.72				
Follow-up	70	20.79	1.92	0.432	69	0.517-0.803	0.667

6.3. Comparing total scores to participants' demographics

A new variable was created to calculate the difference in total scores between the pre-test and post-test. Because the difference between post-test and follow-up was not significant, follow-up total scores were not used to compare changes. Although older participants scored higher in having knowledge and attitude toward pain at the pre-test phase, they showed the least improvement at the post-test compared to younger nurses (F: 10.721, df: 3, p<0.001). Regarding gender, no significant difference found between male and female nurses in respect to the difference between pre-test and post-test (t 0.725, df 90, p=0.741). Similarly, there was no any significant difference between professional degrees in regard to the difference between pre-test and post-test (F: 0.762, df: 2, p=0.470). Regarding length of experience, participants who have a clinical experience of less than one years have showed

higher improvement in means between pre-test and post-test compared to nurses with longer experience (F: 40.08, df: 2, p<0.001).
Factors affecting knowledge and attitudes to pain management
According to the above, age and length of experience were possible predictors to the successfulness of a brief pain education. The multiple-hierarchal regression was used to assess the effect of the both demographic variables in estimating the improvement of knowledge and attitude towards pain after such brief pain education. Regression model was developed through entering separate blocks (Table 5). The dependent variable was the newly created variable (difference between post-test and pre-test), and the independent variables were the age which was entered in the first block, and the clinical experience which was entered in the second block. The results of this model showed that around 30% of the variance of total pain knowledge and attitude scores was explained by the age and length of experience.

Table 5: Summary of Regression Model

Model	R	Adjusted R squared	F change	df	Sig. F change
1	.430[a]	.176	20.401	90	.000
2	.564[b]	.303	17.373	89	.000

a) Predictors: (constant), Age
b) Predictors: (constant), Age, Experience
c) Dependant variable: Difference between pre-test and post-test (POST minus PRE)

6.4. Adherence to regular pain assessment

The percentages of using pain assessment sheets to the number of admitted patients was increased from 10% (at the pretest level) to 92% (eight months after the follow-up phase) as shown in Table 6. Increasing nursing adherence to pain assessment was also noted during the study period to reach 84% within three months.

Table 6: Adherence to Pain Assessment

Month	Completed sheet/total patients	Percentage
4/2013	15/155	10%
5/2013	54/340	16%
6/2013	148/307	48%
7/2013	338/460	84%
8/2013	399/455	87%
9/2013	533/637	86%
10/2013	723/822	87%
11/2013	683/821	83%
12/2013	623/710	88%
1/2014	631/698	91%
2/2014	640/698	92%

7. Discussion

This study showed that nurses' knowledge and attitudes towards pain in addition to their ability to assess pain effectively have shifted from negative to positive competency after receiving pain education. A previous study highlighted the knowledge deficits and negative attitudes of the nurses toward postoperative pain at the ordinary nursing compared to the positive improvement in the clinical competency regarding pain assessment and administration of analgesics after pain education as evidenced by higher KASRP tool score (17). While the difference in total knowledge scores between pre-test and post-test was significant, no significant difference was found between post-test and follow-up. This suggests that nurses have upgraded their knowledge of pain after pain education and they were able to sustain that higher level over a period of time.
These findings conform to a previous study which found that Chinese nurses have improved their pain knowledge following pain education and retained that level of knowledge for more than three months (Zhang, Hsu et al. 2008). Similarly, another study found that nurses' knowledge and attitudes toward pain management have improved after introducing a protocol for pain management (De Rond, De Wit et al. 2001). It is recommended that efforts to improve the quality of the pain management must be directed

towards the implementation of such evidence-based guidelines which are widely acceptable in terms of safety and feasibility of pain management (Gordon, Dahl et al. 2005). As all nurses in this study claimed not receiving any previous pain training, professional training programs regarding pain management are required to enhance better understanding of the usefulness and application of pain assessment (Quinn and Hughes 2007). 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 (23). A recent survey of pain-related content in nursing curriculums worldwide found that in spite of acceptable nursing performance, school education in acute pain management is still inadequate (Vadivelu, Mitra et al. 2012). Similarly, a study of 16 American schools of nursing revealed that approximately 73% of the students claimed being taught about pain management; but only 36.5% believed that they were sufficiently prepared on this topic ((Fishman, Young et al. 2013).
This study found that younger nurses with shorter clinical experience were found more reactive with pain education compared to older nurses with longer clinical experience. A limited number of studies confirmed the relationships between the effectiveness of pain education and either nurse' age and length of experience. One study supported this result and found a negative correlation between age and NKASRP scores in which younger nurses with shorter clinical experience had a better adherence to the basic principle of pain management into practice (Machira, Kariuki et al. 2013). Another study found no significant differences in the mean total KASRP scores by age, education level, years of nursing experience and nurses with higher education levels had a weak positive correlation with KASRP scores (Moceri and Drevdahl 2014) However, Fothergill-Bourbonnais and Wilson-Barnett (28) concluded that clinical experience is the most influential factor that promotes nurses knowledge and confidence in managing patient's pain.
It was evident that a remarkable improvement in nursing adherence 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 and aware to the importance of documenting pain response. This result support the premise that improving nurses' attitude to pain assessment would, in eventual, improve the adherence to pain assessment skillfully (Abed El-Rahman, Kalaldeh et al. 2013). A study (29) found the most significant barrier to effective pain management is nurses' reliance on their own subjective judgment (22). Another study found that 29 statements that describe pain assessment were subjective and inaccurate, and nurses reached their judgments based on their beliefs (19). Therefore, the implementation of pain education is regarded to increase nurses' adherence to pain assessment as it adds further values to the essence of pain management for hospitalized patients (De Rond MEJ, Campen BThM et al. 1999).

8. Limitations of the study

Absence of randomization and controlling to the study intervention would emaciate the validity of findings compared to well-designed randomized-controlled trials. Study sample was restrained to one governmental hospital which may not be generalized to other heath care sectors in Jordan or even to other hospitals in the same sector.

9. Conclusion

The deficits and prejudices in pain management can be improved through 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 a brief pain education was explic-

it. It is viewed that commitment to ongoing pain assessment can be established through professional training and follow-ups for nurses working in the clinical field to introduce up-to-date pain measurement tools. Nurses' contribution to pain management with physicians is also recommended. Future research studies are invited to assess the impact of pain education program on a wider nursing population including different heath care sectors in Jordan.

Acknowledgments

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