Non-Pharmacological Pain Management: Nurses' Knowledge, Attitudes and Practices in selected Hospitals at Makkah El-Mukarramah.

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Abstract: Background: Non-pharmacological methods have unique advantages to relieving pain that medications do not have such as giving the patients a more active role in managing their pain. There are many types of non-pharmacological methods that vary amongst heat/cold, distraction, massage and relaxation. Nurses must have a great knowledge of non-pharmacological methods to practice them effectively. In addition, nurses' own attitudes greatly affect the way they treat a patient's pain. **This study aimed** to evaluate nurses' knowledge, attitudes and practices regarding non-pharmacological pain management in selected hospitals at Makkah El-Mukarmah. **Subjects and methods:** 120 nurses, males and females working in medical and surgical wards in selected three hospitals at Makkah El-Mukarramah. The data was collected through using a self-administered questionnaire consisting of three parts; a socio-demographic characteristics questionnaire, a nurse's knowledge assessment questionnaire, and a non-pharmacological methods questionnaire. **The results show:** knowledge and practices were at a satisfactory level. However, the percentage of applied non-pharmacological pain management was low in hospitals because of a lack of time. There was a positive relationship between age, educational level, years of experience, and attendance on training courses with the knowledge and practice and positive relationship between knowledge and practice of the nursing staff regarding non-pharmacological methods. **Conclusion:** Nurses have a satisfactory level of knowledge and that leads them to have a positive attitude and a high level of efficiency in applying non-pharmacological methods for pain management. **Recommendation:** This study recommended that efforts to improve application of nondrug interventions should focus on innovative educational strategies, using problem solving to secure support, and development and **testing of new delivery methods that require less time from busy staff nurses.**
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Key words: pain, non-pharmacological, nurses, knowledge, attitude, practice.

1. Introduction

Pain is an unpleasant sensation that can range from mild, localized discomfort to agony. Pain has both physical and emotional components. The physical part of pain results from nerve stimulation. Pain may be contained to a discrete area, as in an injury, or it can be more diffuse, as in disorders like fibromyalgia. Pain is mediated by specific nerve fibers that carry the pain impulses to the brain where their conscious appreciation may be modified by many factors[1, 2].

There are three types of pain, based on where in the body the pain is felt: 1st: somatic (caused by the activation of pain receptors in either the body surface or musculoskeletal tissues), 2nd:visceral (the pain we feel when our internal organs are damaged or injured and is by far the most common form of pain), and 3rd: neuropathic (caused by injury or malfunction to the spinal cord and peripheral nerves). Pain of all three types can be either acute or chronic. Acute pain is short lasting and usually manifests in ways that can be easily described and observed. Chronic pain is defined as pain lasting more than three months. It is much

more subjective and not easily described as acute pain. The three pain types can be felt at the same time or singly and at different times. Somatic and visceral pain is easier to treat than neuropathic pain[3].

The care of patients with pain requires a team approach, and nursing staff spend more time with patients than any other health care provider. Nurses are essential in pain diagnoses and treatment in all health care settings. They are closest to the patients and their families and provide constant emotional, spiritual and personal support. They have an important role in assessing and monitoring pain management[4, 5].

Pain should be measured using an assessment tool that identifies the quantity and/or quality of one or more of the dimensions of the patients' experience of pain. The range of pain measurement tools is vast, and includes both uni-dimensional (for example: visual analogue scales and verbal rating scales) and multi-dimensional methods (for example: Brief Pain Inventory and behavioral pain scales). Uni-dimensional tools measure one dimension of the pain experience, for example, intensity. These are tools which are accurate, simple, quick, easy to use and

understand, are commonly used for acute pain assessment, have a verbal rating scale and verbal descriptor scales (for example: none, mild, moderate, severe) and are commonly used for postoperative pain assessment. Multi-dimensional pain assessment tools provide information about the qualitative and quantitative aspects of pain, and may be useful if neuropathic pain is suspected. These require patients to have good verbal skills and sustained ability to concentrate, as they take longer to complete than uni-dimensional tools[6].

Pain management is the alleviation of pain or a reduction in pain to a level that is acceptable to the client. It includes two basic types of nursing interventions: pharmacologic and non-pharmacologic. However, misconceptions and biases can affect pain management. These may involve attitudes of the nurse or the client as well as knowledge deficits. In addition, effective pain management is an important aspect of nursing care to promote healing, prevent complications, reduce suffering and prevent the development of incurable pain states[7].

Non-pharmacological or natural therapies are methods that help decrease the pain. These therapies do not involve taking medicines. People have used "natural" ways to help with pain and healing from the very beginning of time. Non-pharmacologic interventions include cognitive behavioral therapy, relaxation therapy, biofeedback, patient education, self-management, and social support interventions. These types of interventions aim to change behavior, cognitions, and emotions by targeting the psychosocial processes that are implicated in the perceptions and response to pain. There is good evidence that these interventions can be effective in managing pain, particularly in relation to the cognitions surrounding pain; this, however, is predominantly in the short term[8, 9, 10].

To provide optimal patient care, nurses require appropriate knowledge, skills and attitudes towards pain, pain assessment and its management. This must be based on the best available evidence to prevent patients from suffering harm[11].

Nurses should have knowledge of the use of non-pharmacological approaches such as the use of hot and cold mechanisms, acupuncture, massages and breathing measures among others employed in pain management. In addition to the areas of pain management required of a nurse, knowledge of the existing standards of pain management as well as the already established recommendations is considered to be vital, as nurses have the potential to play a vital role in pain management and education. A major prerequisite of effective care delivery is nurses who are prepared at a fundamental level of current knowledge, competence and confidence in understanding and managing pain. A pathway is created with the development of this knowledge and a skills framework which will promote consistent evidence-based practice and will thus contribute to improved health outcomes for the sufferer/s[12, 13].

Attitude is a hypothetical construct that represents an individual's like or dislike for an item. Attitudes are positive, negative or neutral views of an "attitude object": i.e. a person, behavior or event. People can also be "ambivalent" towards a target, meaning that they simultaneously possess a positive and a negative bias towards the attitude in question. Nurses' attitude towards pain management with alternative methods has been examined in a satisfactory number of studies. Nurses' attitudes towards non-pharmacological pain management therapies need to be assessed, and any deficits identified need to be rectified so patients have access to other options to more effectively manage their pain[14-16].

Negative attitudes of nurses related to the experience of pain and pain management have been a barrier to effective pain management for many years. Pain management outcomes for hospitalized patients are often inadequate. The knowledge and attitudes of nurses about evidence-based pain management likely affects their ability to obtain desired patient outcomes. Nurses have the legal responsibility to manage patients' pain and medical/surgical nursing units should be staffed well enough for nurses to carry out their duties[17].

Nurses have a key role in pain management. The promotion of comfort and relief of pain are fundamental to nursing practice. They often use non-pharmacological measures to facilitate comfort for patients within the hospital setting. However, guidelines for use of these measures are commonly inadequate or absent. Nursing staffcan educate patients, families, and other clinicians to use non-pharmacological strategies to manage pain, such as relaxation, massage, and heat/cold. They can investigate patients' attitudes and beliefs about, preference for and experience with non-pharmacological pain-treatment strategies. They can thus tailor non-pharmacologic techniques to the individual[18, 19].

There are many barriers preventing non-pharmacological pain therapies from being used in the hospital, some of which are physicians' orders, physicians' approval, patient compliance, nurses' knowledge, and nurses' acceptance. Overall, nurses felt that although administration of non-pharmacological therapies was sometimes difficult and came with significant obstacles, benefits not only to patients but also to the organization make the pursuit of this activity worthwhile[14, 20].

Aim of the study:

This study aimed to evaluate nurses' knowledge, attitudes and practices regarding non-pharmacological pain management in selected hospitals in Makkah El-Mukarramah.

Significance of the study:

Although there is an increase of knowledge and developments in technological resources regarding pain, many patients still experience pain. Inadequately managed pain can lead to adverse physical and psychological patient outcomes and also impact on their families. This situation causes a reduction in living quality and the functional situation of the patients. Non-pharmacological therapies may help in reducing pain and must be encouraged as part of the comprehensive pain management effort. Also, these methods increase the individual's feeling of control, decrease the feeling of weakness, improve the activity level and functional capacity, reduce stress and anxiety, and improve quality of life. As a result, the dosage of analgesic drugs needed can be reduced decreasing the side effects of the treatment and reducing health care costs by reducing doctor visits and reliance on costly medications.

Research questions:

First: What is the extent of nurses' knowledge, attitudes and practices of non-pharmacological therapies that are used to manage pain?

Second: What are the barriers that prevent nurses from using non-pharmacological therapies for pain management?

2. Subjects and Methods

The aim of this study was to evaluate nurses' knowledge, attitudes and practices regarding non-pharmacological pain management in selected hospitals at Makkah El-Mukarramah.

Subjects:

Convenience sampling of 120 male and female nurses working in medical and surgical wards with inclusive criteria: males and females, their age range between 20and49 and with exclusive criteria: nurses who have cardiovascular diseases.

Research Design:

The study was a descriptive study.

Setting:

The study was conducted at medical and surgical words affiliated in three hospitals at Makkah El-Mukarramah{hospital (1), hospital (2) and hospital (3)}.

Data collection tools:

The data was collected through using the following tool: a self-administered questionnaire consisting of three parts:

Part one: Nurses characteristics questionnaire: It was adapted from [14,21]and modified by the researchers, and included questions about the following data: age,

gender, level of education, years of experience, amount of pain education in the last 2 years, whether there are any pain assessment tools and whether these tools are used, and barriers to using non-pharmacological methods.

Part two: Nurses' knowledge assessment questionnaire: It was adopted from [2, 8, 19, 22- 26].This tool was constructed by the researchers after reviewing the literature to assess nurses' knowledge regarding non-pharmacological pain management.

Scoring System

Analysing nursing knowledge regarding using non-pharmacological methods of pain was plotted under three main categories:

- <60%Poor knowledge
- 60-75%Satisfactory knowledge
- >75%Fair knowledge

Part three: Non-pharmacological methods questionnaire: It was adopted from [14,27].It included statements pertaining to the use of non-pharmacological methods in pain management among patients in which the nurse chooses alternatives that best represent her/his attitudes and practices, such as preparing the patient carefully for a procedure, encouraging the patient to think about/imagine pleasant and positive matters when s/he feels pain, trying to focus patient's thoughts/attention away from pain, encouraging patients to relax and teaching them correct breathing technique, types of non-pharmacological pain management therapies (thermal regulation), massage, position change and verbally comforting and reassuring the patient.

Scoring System

This consists of five grades ranging from 1-5.Grade 1= not at all, 2 = very seldom, 3= sometimes, 4 = nearly always, and 5 = always.

For analysis the nursing practices regarding non-pharmacological methods for pain management were plotted under two main categories (≥60 % satisfactory and <60 % unsatisfactory) after having divided the total practices to six items (patient preparation, distraction, relaxation, thermal regulation, massage and environmental comfort).

Procedure:

Preparatory Phase:

This included reviewing the literature related to non-pharmacological therapies for pain management using books, articles, magazines and electronic methods (Internet) to develop the study tools for data collection.

Content Validity:

After the investigators modified the tools they were presented to experts from the nursing staff to achieve content validity.

Pilot Study:

A pilot study was carried out on 10 nurses who fulfilled the criteria. They were chosen from the Hospital (1), Hospital (2) and Hospital (3) in Makkah El-Mukarramah. This initial study was conducted to test the content applicability, clarity and arrangement of the items needed for each questionnaire.

Official Permission:

Official permission to conduct the study was obtained from the general manager of Hospital (1), Hospital (2) and Hospital (3) in Makkah El-Mukarramah and the Heads of Medical and Surgical departments. This followed an explanation of the aim of the study in a letter issued from the faculty of nursing to training and scholarship center.

Informed consent was obtained from each nurse to participate in the study after the aim of the study had been explained.

Field Work:

The actual field work was carried out from the beginning of Shawwal1433 to the end of Dhul-Qi'dah1433H. The researchers were available three days per week in different shifts. The process of data collection took 8 weeks. The nature and the purpose of the study were explained by the researchers to all heads of departments and nurses. Then the questionnaire was distributed by the researchers. The average time needed for each form completion was around 45 minutes. Nurses' verbal agreement was obtained before the researchers began to collect the data.

Ethical Considerations:
The ethical research considerations in this study included the following:
- The research approval was obtained before research implementation.
-The objectives and the aim of the study were clear to the participants.
-The research maintained anonymity and confidentiality of the subjects.
-Subjects were allowed to choose to participate or not and they had the right to withdraw from the study at any time without penalty.

Statistical Analysis:

An IBM compatible PC was used to store and analyse the data and to produce graphic presentations of important results. Calculations were done by means of a statistical software package namely, "SPSS". Data was tabulated and analysed by using percentages, and chi square tests.

3. Results

Table 1 shows that the age of the studied sample was divided into three categories, the most common age range was between 20<30 years. This was followed by the category 30<40 years, and the least common category was 40 <50 years. While most of the studied sample was female, the proportion of females in the three hospitals was 72.5%, 92.5%, and 47.5% respectively. Also, regarding the nurses' educational level, about half of them in hospitals (1&3) (52.5%) reported having a baccalaureate while hospital (2) 70% reported holding a diploma. Only a small number of nurses held a Masters qualification.

Figure 1 shows that by far the largest category of years of experience of members of the studied sample was 0-9years in which the largest percentage presents at hospital (1), followed by hospital (2) then hospital (3) (95%, 77.5%, and 72.5% respectively). There was no record of 20-30 years of experience.

Figure 2 shows the converged proportion of individuals who have received courses in a period of time and those who have not. More than half of the study sample at hospitals (2& 3) had attended training program courses while in hospital (1)70% had not attended courses.

Table 2 illustrates that the proportion of the studied sample that do not use pain assessment tools compared to those who use them is largest in hospital (1). Those who use these standards show that they did not meet on a particularly uniform scale, despite the high proportion using the first and third scales (happy-sad face and 0-10 Scale) in the three hospitals.

Figure 3 shows that the most common barrier that prevents nurses using non-pharmacological methods for pain management for patients in the three hospitals (1,2 &3) was the lack of time (55%, 62.5%, 15% respectively), then followed by unwillingness of patients (5%, 25%, 7.5% respectively) and lastly, the age level of the patient (7.5 %, 10%, 10% respectively).

It appears from Table 3 that hospital (3).recorded the highest percentage in the level of knowledge of nursing staff where all the answers were in the satisfactory and fair level (12.5% and 87.5% respectively) while the greatest variety among answers was at hospitals (1& 2) between the three bands, but this showed a more satisfactory widespread scale ranges (57.5% and 42.5% respectively).

Table 4 describes nurses' attitudes and practices regarding the use of non-pharmacological methods for pain management. The majority of subjects at hospital (3)have achieved a satisfactory level in patient's preparation, distraction, thermal regulation, massage and touch and environmental comfort (85%,77.5%, 72.5%,80%,100%,and 95% respectively) and hospital (2) (87.5%,100%,80%, 70%,77.5%,72.5 respectively), while at hospital (1), the nurses show an unsatisfactory level in thermal regulation and environmental comfort (52.5%,42.5% respectively) and a satisfactory level in patient's preparation, distraction, massage and touch (65%, 92.5%, 67.5%,60%respectively).

Table 5shows a similarly satisfactory level of attitudes and practices at the three hospitals, butt heat hospital (3) exceeds others in the level of practice (85%).

Table 6 illustrates that there is a positive relationship between age, educational level, years of experience, and attendance on training courses with the knowledge of nursing staff at three hospitals.

Table 7 shows a positive relationship between age, educational level, years of experience and attendance of training courses with attitudes and practices of nursing staff at three hospitals

Table 8 illustrates that there is a positive relationship between the knowledge and practice of nursing staff studied in the three hospitals.

Table 1: Percentages distributions of socio-demographic characteristics of studied sample (NO=120)

| Items	Hospital(1)				Hospital(2)				Hospital(3)			
	No. 40	% 100	Mean	±SD	No. 40	% 100	Mean	±SD	No. 40	% 100	Mean	±SD
Age												
20 < 30	29	72.5			27	67.5			32	80		
30 < 40	11	27.5	1.27	0.45	10	25	1.4	0.63	8	20	1.2	0.40
40 < 50	0	00			3	7.5			0	00		
Sex												
Male	11	27.5	1.72	0.45	3	7.5	1.92	0.26	21	52.5	1.47	0.50
Female	29	72.5			37	92.5			19	47.5		
Level of education												
Baccalaureate	21	52.5			12	30			21	52.5		
Diploma	19	47.5	1.47	0.50	28	70	1.70	0.46	16	40	1.55	0.63
Master's	0	00			0	00			3	7.5		
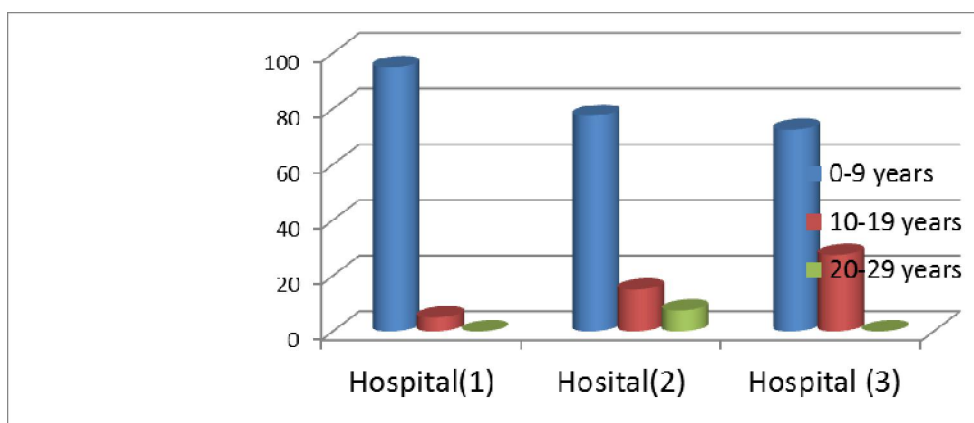
Figure 1: Percentages distributions of years of experience of studied sample
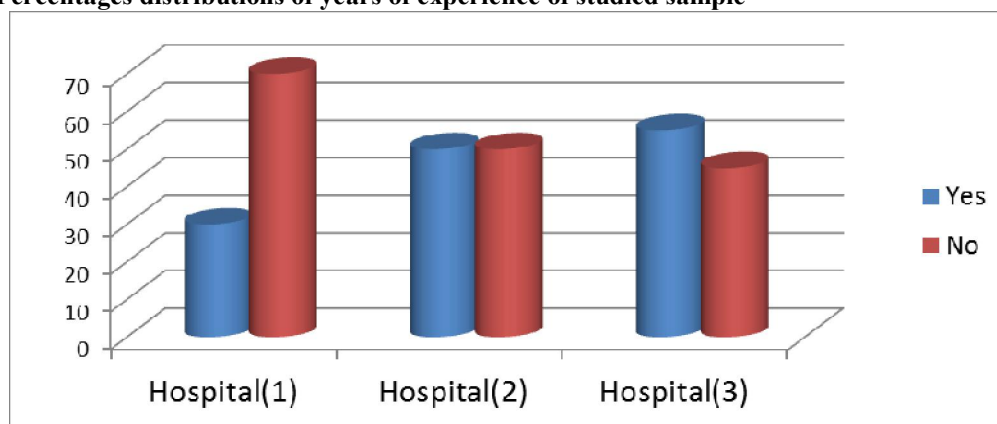
Figure 2: Percentages distributions of attendance on a course of education for non-pharmacological methods of pain management in the last 2 years

Table 2: Percentages distributions of nurses' assessment regarding using non-pharmacological methods of pain management (NO.120)

Items	Hospital(1)		Hospital(2)		Hospital(3)	
	No. 40	% 100	No. 40	% 100	No. 40	% 100
Presence of pain assessment tool						
Yes	16	40	22	55	30	75
No	24	60	18	45	10	25
If yes , the name of tool :						
Happy-sad face	9	22.5	6	15	9	22.5
Visual Analogue Scale	0	00	0	00	2	5
0-10 Scale	6	15	9	22.5	8	20
FLACC Scale	0	00	0	00	0	00
Verbal categorical rating Scale	0	00	2	5	2	5
Pain Assessment in Advanced Dementia (PAINAD) Scale	1	2.5	0	00	1	2.5
Pain assessment sheet (form)	0	00	5	12.5	11	27.5
Abbey pain Scale	0	00	0	00	0	00
Using of the tool :						
Yes	16	40	13	32.5	27	67.5
No	24	60	27	67.5	13	32.5
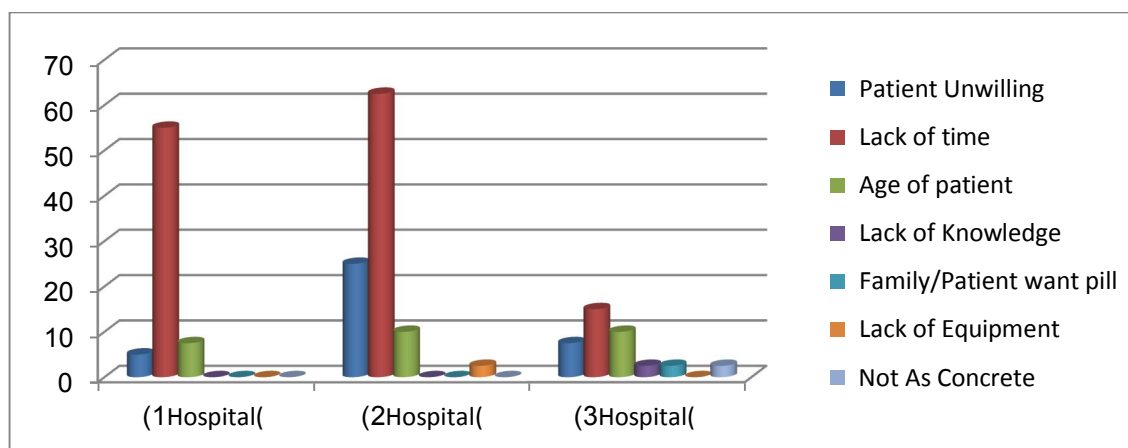
Figure 3: Percentages distributions of barriers that prevent nurses' use of non-pharmacological methods of pain management

Table 3: Distributions of nurses' knowledge regarding using non-pharmacological methods of pain management (NO.120)

Items	Hospital(1)		Hospital(2)		Hospital(3)		Statistical tests		
	No. 40	% 100	No. 40	% 100	No. 40	% 100	Ch^2	P	Sig
Total Degree : 38									
Poor < 60%	8	20	18	45	0	00			
Satisfactory 60-75%	23	57.5	17	42.5	5	12.5	1.12	$\succ$ 0.05	Not significant
Fair > 75%	9	22.5	5	12.5	35	87.5			

Table 4: Distributions of attitudes and practices as reported by nurses regarding using non-pharmacological methods of pain management (NO.120)

Items	Hospital(1)		Hospital(2)		Hospital(3)		Statistical tests		
	No. 40	% 100	No. 40	% 100	No. 40	% 100	Ch^2	P	Sig
Patient Preparation = 85 degree									
Unsatisfactory **< 60%**	14	35	5	12.5	6	15	0.31	$\succ$ 0.05	Not significant
Satisfactory ≥ 60%	26	65	35	87.5	34	85			
Using of distraction method = 45 degree									
Unsatisfactory **< 60%**	3	7.5	0	0	9	22.5	0.42	$\succ$ 0.05	Not significant
Satisfactory ≥ 60%	37	92.5	40	100	31	77.5			
Using of relaxation technique = 15 degree									
Unsatisfactory **< 60%**	13	32.5	8	20	11	27.5	0.39	$\succ$ 0.05	Not significant
Satisfactory ≥ 60%	27	67.5	32	80	29	72.5			
Using of thermal regulation = 15 degree									
Unsatisfactory **< 60%**	21	52.5	12	30	8	20	0.35	$\succ$ 0.05	Not significant
Satisfactory ≥ 60%	19	47.5	28	70	32	80			
Using of massage and touch = 25 degree									
Unsatisfactory **< 60%**	16	40	9	22.5	0	0	0.47	$\succ$ 0.05	Not significant
Satisfactory ≥ 60%	24	60	31	77.5	40	100			
Using of environmental comfort = 40 degree									
Unsatisfactory **< 60%**	17	42.5	11	27.5	2	5	0.36	$\succ$ 0.05	Not significant
Satisfactory ≥ 60%	23	57.5	29	72.5	38	95			

Table 5: Distributions of total attitudes and practices as reported by nurses regarding using non-pharmacological methods of pain management

Items	Hospital(1)		Hospital(2)		Hospital(3)		Statistical tests		
	No. 40	% 100	No. 40	% 100	No. 40	% 100	Ch^2	P	Sig
Total Practices = 225 degree									
Unsatisfactory <60%	14	35	7	17.5	6	15	0.42	$\succ$ 0.05	Not significant
Satisfactory ≥ 60%	26	65	33	82.5	34	85			

Table 6: Correlation between nurses' knowledge and their age, level of education, years of experience, attendance of a course of education for non-pharmacological methods of pain management in the last 2 years

	Knowledge	
	P	Sig
Age	0.232	0.023
Level of education	0.141	0.099
Years of experience	0.173	0.047
Attendance of a course of education for non-pharmacological methods of pain management in last 2 years	0.099	0.031

Table 7: Correlation between nurses' attitudes and practices and their age, level of education, years of experience, attendance of a course of education for non-pharmacological methods of pain management in the last 2 years

	Practices	
	P	Sig
Age	0.149	0.042
Level of education	0.234	0.035
Years of experience	0.214	0.046
Attendance of a course of education for non-pharmacological methods of pain management in last 2 years	0.185	0.043

Table 8: Correlation between total knowledge and total practices.

	Knowledge	
	P	**Sig**
Practices	0.153	0.046

4 . **Discussion**

Discussion of the findings will cover four main areas. First, the socio-demographic characteristics of the group under study and nurses' assessment regarding use of non-pharmacological methods of pain management. Second, the barriers that prevent nurses use' of non-pharmacological methods of pain management. Third, nurses' knowledge regarding use of non-pharmacological methods of pain. Fourth, attitudes and practices as reported by nurses regarding the use of non-pharmacological methods for pain management.

First, the socio-demographic characteristics of the studied sample and nurses' assessment regarding use of non-pharmacological methods of pain management:

The results of the current study revealed that the most common age group among subjects of the study sample was 20-30 years, most of whom were female. These findings were congruent with an earlier study (Elcigil *et al.,* 2011) which reported the demographic characteristics of the participating nurses comprised a majority who were20 to 30 years old, and 99% of which were female[28].

In addition, the study showed that the largest percentage of the study sample had between 0-9 years of experience. It also showed the converged proportion of individuals who have received courses in a period of time and those who have not. These results were congruent with a previous study (Bicek, 2004)which reported that most of the members studied had fewer than 10 years' experience (55.3%) and 60.4% had classes in the past 2 years in non-pharmacological pain management[14].

With regard to the level of education, the current study shows that most of the subjects in the study have Bachelor degrees or diplomas. Only a very small number of subjects in the study held a Masters degree. These results were congruent with an earlier study (Fourie, 2008) which reported that in terms of education, 77.2% of respondents were in possession of a Diploma qualification in nursing, 15.8% of respondents had obtained a Bachelor Degree in nursing and only 7% had completed a Masters degree in nursing[29].

The study found that the proportion of the studied sample that do not use pain assessment tools (PAT) in the three hospitals is larger than those who use them; while those who use these standards show that they did not meet them on a particularly uniform scale. This finding was congruent with a recent study by Vickers (2011) who reported that the incorporation of a pain assessment tool (PAT) was used in less than 9% of the cases where nurses assessed pain[30].

The most common PAT were happy-sad faces and 0-10 scales as shown by the results of this study, which were congruent with Clavreule (2012) who reported that most nurses feel that they have a good understanding of pain. They have charts and diagrams that they use to help their patients describe just how much discomfort they are experiencing. On a scale from 0-10, with zero being no pain, and so on; or the happy/sad face pictorial chart where they ask the patient to choose the appropriate smiley/frowning face[31].

Second, barriers that prevent nurses using non-pharmacological methods of pain management:

The results of the current study revealed that the most significant obstacle to the use of non-pharmacological methods for patients was the lack of time. This was in agreement with Morgan (2012) who reported that time has been identified by nurses as one of the enabling factors. The time needed to implement non-pharmacological therapies is long, therefore, discouraging most nurses from its use. Since these therapies are not considered standard practice, their use is, therefore, not considered a priority. Although the nurse may be supportive of the use of non-pharmacological therapies their use of these therapies is counterbalanced by perceived restrictions of lack of time[32].

Third, nurses' knowledge regarding use of non-pharmacological methods of pain management:

In relation to the level of knowledge, the results of this study showed a satisfactory level of knowledge regarding use of non-pharmacological pain management methods. However, this contradicted the findings of an earlier study by Lui *et al.* (2008) who reported nurses have inadequate knowledge about non-pharmacological interventions for pain patients[33].

Fourth, attitudes and practices as reported by nurses regarding use of non-pharmacological methods of pain management:

The results of the current study revealed that there is a satisfactory level of attitudes and practice of nurses. These results are congruent with (Kipkorir 2011) who reported nurses are in a better position, as compared to other professionals in healthcare, to effectively manage pain, due to their close relationship with patients. A positive attitude is the key to successful pain management. The results of this study indicate that the level of attitudes of nurses is satisfactory[13].

At the same time these findings conflict with Basak (2010) who reported pain management action is performed less by nurses using non-pharmacological methods to reduce pain. This indicated that nurses may not have adequate knowledge regarding non-pharmacological methods. In addition, a study by Matthews and Malcolm (2007) reported non-drug methods are very effective for combining with the

treatment of pain but only 6% of nurses in their study used non-drug methods[34,35].

The results of this study show a positive relationship between age, educational level, years of experience, and attendance on training courses with the knowledge and practice of nursing staff. This was congruent with a study by Wilson (2007) who reported nursing education, professional activity, and years of clinical experience contribute to the knowledge necessary for competency in pain management[36].

The current study revealed a positive relationship between knowledge and practice of nursing staff regarding non-pharmacological methods. This finding was congruent with Thomas (2009) who reported a lack of knowledge regarding non pharmacological methods resulted in poor nursing practice[37].

In the view of the researchers, if nurses have a sound base of knowledge of non-pharmacological pain management therapies this will enable them to have positive attitudes towards their use and they will practice these methods at the same level of their knowledge.

Conclusion
The study concludes that: The most common barrier to applying non-pharmacological methods was lack of time. Nurses in the study have a satisfactory level of knowledge and that leads to attitudes which encourage a high level of practices regarding non-pharmacological methods of pain management. The findings reveal a positive relationship between ages, educational level, years of experience, and attendance on training courses with the knowledge and practices and positive relationship between knowledge and practices of nursing staff regarding implementation of non-pharmacological methods.

Recommendations
This study recommends:

A training program to encourage nurses to educate patients about benefits of non-pharmacological methods to relieve pain so they can accept these methods. Further study should be conducted in other hospitals to gain additional information on the level of knowledge and practice of nurses regarding non-pharmacological methods of pain management. Efforts to improve application of non-drug interventions should focus on innovative educational strategies, using problem solving to secure support, and development and testing of new delivery methods that require less time from busy staff nurse.

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