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Nursing performance regarding non-pharmacological pain management for patients with the cardiothoracic surgery at Zagazig University Hospitals

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Abstract

Background: Cardiothoracic surgery patients are exposed to a wide range of pain following tissue injury associated with surgery, so adequate pain control is a substantial factor in improving patients' outcomes. Non-pharmacological measures are an important part of pain management that is used by critical care nurses to increase the tolerance of experienced pain, decrease physical stress, reduce the feeling of weakness, and reduce the use of analgesics. The study aimed to assess nursing performance regarding non-pharmacological pain management for patients with cardiothoracic surgery at Zagazig University Hospitals. Research design: A descriptive design was used. Tools of data collection: An interview questionnaire and observational checklist were used to collect data. Study subjects: convenient sample of all available nurses (55) working in cardiothoracic surgery wards and open heart ICU at Zagazig University Hospitals. Results: Studied nurses' age ranged between 22-50 years old, 96.4% of them were females, 63.6% of studied nurses had a technical institute degree in nursing science, and 61.8% of studied nurses didn't attend previous training courses about non-pharmacological pain management. Furthermore, 61.8% of studied nurses had unsatisfactory total knowledge and 67.3% had unsatisfactory total practice regarding non-pharmacological pain management. There was a positive statistically significant correlation of total nurses' knowledge score with total practice score, nurses' age, and nurses' experience years in the nursing field and at the cardiothoracic surgery departments. Conclusion: Nurses had an unsatisfactory level of knowledge and practice regarding non-pharmacological pain management. Recommendation: Practical training programs and workshops are highly recommended to improve nursing performance regarding pain assessment and non-pharmacological pain management for patients with cardiothoracic surgery.

Keywords: Nursing performance, Non pharmacological pain management, cardiothoracic surgery.

Introduction

Cardiothoracic surgeries, rank among the most frequently performed surgical interventions worldwide (1). Up to 80% of surgical patients reported inadequate pain control postoperatively, which can lead to increased

morbidity, decreased quality of life, longer recovery times, and higher health care costs (2).

Additionally, poorly controlled postoperative pain can cause multiple complications in the recovering patient including impairing breathing and movement. Moreover, postsurgical pain after cardiothoracic surgery is a major source of stress and distress for patients (3).Post cardiothoracic surgery pain is sever because operations involving the chest necessitate thoracotomy or sternotomy, which damage the pleural lining, surrounding musculature, cost vertebral joints, and intercostals nerves (4). So, managing this pain in the care setting can potentially facilitate recovery and early ambulation in order to improve respiratory function and decrease postoperative complications after cardiothoracic surgery (5). Adequate cardiothoracic surgery pain management becomes the main care element for patients in the postoperative period (6). Opioid, paracetamol, and nonsteroidal anti- inflammatory drugs are commonly used for pharmacological management of postsurgical pain. Unfortunately, adequate pain control is not always satisfactory. Furthermore, many of these painkillers have been limited due to serious side effects including nausea, vomiting, constipation, tolerance or hyperalgesia (7). In addition to medication therapy, there are non-pharmacological techniques such as massage therapy, physical therapy, and transcutaneous electrical nerve stimulation (TENS) therapy. Using both pharmacological and non-pharmacological interventions can improve pain control, enhance recovery, and increase patient satisfaction (8). Non-pharmacological interventions can be used in the preoperative process to help relieve postoperative pain. These are frequently inexpensive and simple to implement (9). In the postoperative setting, the non-pharmacological pain management methods can be used as part of a self-management program, increasing patient independence, and autonomy (10). Nurses' understanding of patients' pain is important inpatient care, as nurses play a central role in patient's pain assessment and management (11). The nursing pain management strategies for the patients with post-operative pain can be categorized into two dimensions: implementing the medication doctor order, and applying the non-pharmacological interventions model (12). In general, the nurses when implementing the non-pharmacological interventions model can play an important role in improving the quality of care and saving the treatment costs

(13). Moreover, nurses' knowledge and attitude greatly affect the use of non-pharmacological pain management methods (14). Therefore, the aim of the study was to assess nursing performance regarding non-pharmacological pain management for patients with cardiothoracic surgery at Zagazig University Hospitals.

Significance of the study

Cardiovascular diseases (CVD) are ranked first among all causes of death worldwide. The World Health Organization in 2017 reported that 17.7 million people lost their lives due to cardiovascular diseases in 2015, representing 31% of all deaths worldwide. It is estimated that 7.4 million of these deaths were caused by coronary heart disease and more than 23 million annually might lose their lives by 2030 (15). The morbidity rate in Egypt as a result of CVD is 5.6% (16). Cardiothoracic surgery may be the treatment for cardiothoracic diseases (17); more than 80% of cardiothoracic surgery patients experienced moderate to severe pain after surgery and complaining of inadequate pain management (18). Non-pharmacological therapies for pain management have become increasingly popular and can be useful in managing pain (19). It is important to understand nurses' experiences on non-pharmacological pain management therapies because their practices and knowledge regarding these therapies can affect their response to managing the pain of their patients (20). Therefore, the aim of the study was to assess nursing performance regarding non-pharmacological pain management for patients with cardiothoracic surgery at Zagazig University Hospitals.

Aim of the study

The current study aimed to assess nursing performance regarding non-pharmacological pain management for patients with cardiothoracic surgery at Zagazig University Hospitals.

Methodology

Research questions

1- What is the nurses' knowledge about non-pharmacological pain management for patients with cardiothoracic surgery?

2- What are the nurses' practices regarding non-pharmacological pain management for patients with cardiothoracic surgery?

Design

A descriptive design was utilized to achieve the aim of this study.

Setting

The study was conducted in the postoperative cardiothoracic surgery department at Zagazig University Hospitals, which is composed of an open heart ICU contains 12 beds with 20 nurses and cardiothoracic surgery wards consist of 56 beds with 35 nurses.

Sample

The study sample included a convenient sample of all available nurses working in the cardiothoracic surgery departments (open heart ICU and cardiothoracic surgery wards) at Zagazig University Hospitals. Their total number was 55 nurses with at least one year of experience.

Tools of Data Collection

Two tools were used to collect the necessary data:

Tool I: An interview questionnaire:

This tool compromised of the following parts:

Part 1: Nurses' demographic data: This part was concerned with assessing the demographic characteristics of nurses. It contained mine close-ended questions (9 questions) such as age, gender, marital status, educational level, area of residence, years of experience in the nursing field and the cardiothoracic surgery departments (ward and open heart ICU), and previous attendance of training courses about assessment of pain and non-pharmacological pain management for patients with cardiothoracic surgery.

Part 2: Nurses' knowledge: This part was intended to assess nurses' knowledge regarding non-pharmacological pain management for patients with cardiothoracic surgery. It was developed by the researcher based on pertinent literature (21; 22; 23and 24), it was contained 42 MCQ questions and 31True and false questions. It covered the following areas of knowledge:

A-Nurses' knowledge about cardiothoracic surgery patients' pain, contained 27 questions (9MCQ questions and 18True and false questions) covered the definition of pain, types of pain, degrees of pain, causes of pain, characteristics of acute and chronic pain, physiological responses to pain, behavioral response, psychological response and vital signs changes as a

response to pain, and factors affecting individual pain perception. B-Nurses' knowledge about pain assessment, contained 23 questions (18 MCQ questions and 5 true and false questions), covered the definition and methods of pain assessment, pain rating scales as verbal, numerical, visual, and behavioral pain scale, etc. C-Nurses' knowledge about non-pharmacological pain management, contained 23 questions (15 MCQ questions and 8 True and false questions), covered the methods of pain management, definition of non-pharmacological pain management, types of non-pharmacological pain measures, the advantage of different types of non-pharmacological pain management methods as heat and cold compresses, back massage, relaxation technique, TENS, and acupressure therapy, nursing role regarding non-pharmacological methods, etc. Scoring system: For the knowledge items, the correct answer was scored "1" and the incorrect "zero". For each area of knowledge, the scores of the items were summed-up and the total divided by the number of the items, giving a mean score for the area. These scores were converted into percent scores. The knowledge was considered satisfactory if the percent score was 65% or more and unsatisfactory if less than 65% based on data entering of the pilot study and statistical analysis. Tool II: Observational checklists: This tool was used to assess the adequacy of nurses' practices regarding pain assessment and non-pharmacological pain management methods for the patients with cardiothoracic surgery; it was developed by the researcher based on pertinent literature (25; 26 and 24). It covered the following areas of practice: A-Nurses' practice regarding pain assessment: It was contained 43 items covering 4 parts: Assessment of patients' complaints (onset, location, duration, intensity and quality of pain, precipitating, alleviating, and aggravating factors of pain), monitoring of vital signs during pain (temperature, blood pressure, pulse rate, respiratory rate), assessing patient's behaviors toward the pain (assessing activity/body movement, sleep, and appetite pattern, co-morbid signs and symptoms of the patient), and general practices regarding pain assessment as analgesics history, pervious pain experience and intervention used, using the facility of the pain assessment tool, assess pain at regular intervals, document pain scale and vital signs, reporting of pain and any alarming signs, etc. B-Nurses' practice of non-pharmacological pain management methods: It was contained 119 items covered 6 parts: applying warm and cold compresses (21 items), performing back massage (23 items), performing relaxation

technique (17 items), applying and caring for the patient using a transcutaneous electrical nerve stimulation (21 items) and performing acupressure (16 items). Scoring system: Each practice item observed to be done correctly was scored "1" and the not-done "zero". For each area of practice, the scores of the items were summed-up and the total divided by the number of the items, giving a mean score for the area. These scores were converted into percent scores. The practice was considered satisfactory if the percent score was 65% or more and unsatisfactory if less than 65% based on data entering of the pilot study and statistical analysis.

Validity and reliability of the tool

Once the tool was prepared in their preliminary form, the data collection tools were presented to a panel of five experts from different nursing. Cronbach's Alpha used to measure the internal consistency (reliability of used tool) was 0.83 for knowledge (tool I) and 0.95 for practice (tool II) acceptable.

Field work

After necessary permission was obtained, the researcher then met with the nurses individually, explained to them the aim of the study and the process of collection of the data, and invited to participate. Those who gave their consent were given a structured interview questionnaire. This took 30 minutes from each nurse. The data collection process of this study was carried out through six months in the period from the beginning of August 2019 to the end of January 2020.

Pilot study

A pilot study was conducted on five nurses representing 10% of the main study sample. The purpose of the pilot was to check and ensure the clarity, applicability, and feasibility of the tools, to identify the difficulties that may be faced during data collection. It also helped to estimate the time needed to fill in the forms. Since no modifications were done in the tool, those who shared in the pilot study were included in the main study sample.

Ethical consideration

The study protocol was approved by the research ethics committee at the Faculty of Nursing, Zagazig University. Each potential subject was informed

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about nature, purpose, and benefits of the study, and informed that her participation is voluntary before giving her verbal consent to participate. The anonymity of the subjects was also assured through coding all data. The researcher assured that the data collected and information will be confidential and would be used only for the purpose of the study.

Statistical Design

All data were collected, tabulated, and statistically analyzed using SPSS 20.0 for windows (SPSS Inc., Chicago, IL, USA 2011). Quantitative data were expressed as the mean ± SD & range, and qualitative data were expressed as absolute frequencies (number) & relative frequencies (percentage). Percent of categorical variables were compared using the Chi-square test or Fisher's exact test when appropriate. Pearson's correlation coefficient was calculated to assess the relationship between various study variables, (+) sign indicates direct correlation & (-) sign indicates inverse correlation, also values near to 1 indicate strong correlation & values near zero indicate weak correlation. All tests were two-sided. P-value < 0.05 was considered statistically significant (S), and p-value ≥ 0.05 was considered statistically insignificant (NS).

Administrative design

To carry out the study, the necessary approvals were obtained from the hospital administrative personnel by the submission of a formal letter from the dean of the Faculty of Nursing, Zagazig University explaining the aim of the study in order to obtain permission and help.

Results:

Table 1: Frequency and Percentage Distribution of Demographic Characteristics of Studied Nurses (n=55):

Demographic characteristics	No.	%
Age per years:		
<30	35	63.6
≥30	20	36.4
Mean ±SD Range	31±9.06 22-50	
Gender:		
Male	2	3.6

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Female	53	96.4
Social status:		
Married	40	72.7
Single	15	27.3
Residence:		
Urban	30	54.5
Rural	25	45.5
Nursing qualification:		
Bachelors	5	9.1
Technical institute	35	63.6
Diploma	10	18.2
Diploma +specialty	5	9.1
Experience years in the nursing field:		
<5	23	41.8
≥5	32	58.2
Mean ±SD Range	10.5±9.4 1-30	
Experience years in cardiothoracic surgical departments:		
<5	30	54.5
≥5	25	45.5
Mean ±SD Range	7.8±7.9 1-30	
Attended training courses about pain assessment:		
Yes	24	43.6
No	31	56.4
Attended training courses about non-pharmacological pain management methods		
Yes	21	38.2
No	34	61.8

Table 1: shows that studied nurses' age range between 22-50 with mean± SD=31±9.06years, 96.4%of the studied nurses' were females and 72.7% of studied nurses were married and more than half (54.5%) of studied nurses residing in urban areas. Regarding nursing qualification, 63.6% of studied nurses had technical institute, 45.5 of studied nurses had experience ≥5 years

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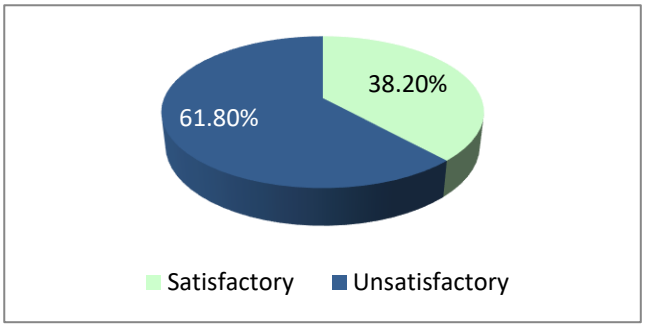
in the cardiothoracic surgical department. Related to the attendance of training courses, 56.4% and 61.8% respectively of studied nurses not attended previous training courses about pain assessment and non-pharmacological pain management methods.

Table 2: Distribution of studied nurses' knowledge regarding non-pharmacological pain management methods for patients with cardiothoracic surgery (n=55):

Variables	Satisfactory ≥65%		Unsatisfactory <65%	
	No	%	No	%
Total nurses' knowledge about pain	23	41.8%	32	58.2%
Total nurses' knowledge regarding pain assessment	26	47.3%	29	52.7%
Total nurses' knowledge regarding non-pharmacological pain management methods	15	27.3%	40	72.7%
Total nurses' knowledge regarding non-pharmacological pain management	21	38.2%	34	61.8%

Table 2 shows that more than two-fifths (41.8%) of studied nurses had total satisfactory knowledge about pain, also less than one-half (47.3%) of nurses had satisfactory knowledge about assessing pain, while only quarter 27.3% of studied nurses had satisfactory knowledge about non-pharmacological pain management methods. In general 38.2% of the studied nurses had satisfactory knowledge level about non-pharmacological pain management for cardiothoracic surgery patients.

Figure 1: Total nurses' knowledge about non-pharmacological pain management for cardiothoracic surgery patients (n=55)



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Figure 1 illustrated that about two thirds (61.8%) of studied nurses had unsatisfactory total knowledge regarding non- pharmacological pain management for cardiothoracic surgery patients, while 38.2 % of them had satisfactory knowledge about it.

Table 3: Distribution of studied nurses' practice regarding applying non-pharmacological pain management methods for patients with cardiothoracic surgery:

Variable	Satisfactory		Unsatisfactory	
	No	≥65%	No	<65%
Nurses' practice regarding applying warm compresses	27	49.1	28	50.9
Nurses' practices regarding applying cold compresses	26	47.3%	29	52.7%
Nurses' practices regarding performing a back massage	24	43.6%	31	56.4%
Nurses' practices regarding performing relaxation techniques	8	14.5%	47	85.5%
Applying and caring for the patients using a transcutaneous electrical nerve stimulation (TENS)	19	34.5%	36	65.5%
Nurses' practices regarding performing acupressure	25	45.5%	30	54.5%
Total nurses' practices regarding non-pharmacological pain management methods	18	32.7	37	67.3

Table 3: defined that 49.1% of the studied nurses had satisfactory practices level regarding applying warm compresses, 47.3% regarding applying cold compresses, 43.6% regarding performing a back massage, 14.5% regarding performing relaxation techniques, 34.5% regarding applying and caring for the patients using TENS, and 45.5% regarding performing acupressure. Also, 32.7% of the studied nurses had satisfactory practices level regarding non-pharmacological pain management methods.

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Figure 2: Total nurses' practice regarding non-pharmacological pain management for the patients with cardiothoracic surgery (n=55):

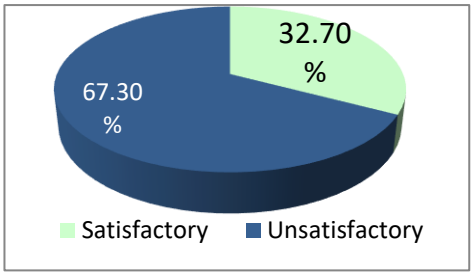


Figure 2 illustrates that , more than two thirds (67.30%) of studied nurses had unsatisfactory practices level regarding non-pharmacological pain management for the patients with cardiothoracic surgery, while 32.70 % of them had satisfactory practice level about it.

Table 4: Correlations between total nurses' practices and total knowledge score and their characteristics (age of nurses, experience years in the nursing field, and experience years in cardiothoracic surgery departments):

Items	Total practice score	
	(r)	p-value
Total knowledge score	0.41	0.002
Age of nurses	0.69	0.0001
Experience years in the nursing field	0.63	0.0001
Experience years in cardiothoracic surgery departments	0.6	0.0001

(r) Correlation coefficient significant $p < 0.05$.

Table 4 shows a positive significant correlation between nurses' total practice score and total knowledge score with P-value0.002, age of nurses with p-value 0.0001, experience years in the nursing field with p-

value0.0001, and experience years in the cardiothoracic surgery department with p-value 0.0001.

Discussion

Regarding demographic characteristics of studied nurses, the current study found that about two-third of the studied nurses their age was less than 30 years old and the majority of them were females. The high percentage of them was carrying technical institute nursing degree, while the lowest percentage had bachelor graduate in nursing. The high percentage of females in the current study is due to the dominance of females in the nursing profession in Egypt. In relation, the years of experience, two-fifths of them had less than five years of working experience in the nursing field, and half of them had less than five years of working experience in the cardiothoracic surgery department. These study findings is concurred by (27), who stated in a study entitled "Impact of an Educational program on pediatric Nurses knowledge regarding non-pharmacological pain management in neonatal intensive care units" that, 62.5% of studied nurses aged between 20 to less than 25 years, 57.5% of them graduated from technical nursing institute while 15% had baccalaureate nursing degrees and 60% of them had 1 to less than 3 years experience in neonatal intensive care unit. Also, these findings supported by (28), who showed in his study entitled "Critical care nurses' use of non-pharmacological pain management methods in Egypt" that, most of the nurses in his study were younger, with lower educational level (secondary nursing school graduates) and fewer years of experience. On the other hand, these findings disagree with (29), who showed that 58.7% of nurses had a general nursing diploma as their highest qualification. Also, disagree with (30), who conducted a study about "Effectiveness of educational intervention on Jordanian nurses' knowledge and attitude regarding pain management" and revealed that 51.7% of participants were male and 90.5% of them had a bachelor's degree in nursing science. The current study findings revealed that more than two-thirds of the studied nurses had unsatisfactory total knowledge about non-pharmacological pain management methods. From the researcher' point of view, the unsatisfactory knowledge of studied nurses in the present study may be attributed to that about two-third of studied nurses were new graduates (less than 30 years old), and only 9.1% of studied nurses had bachelors graduate in nursing,

while the most of them had technical institute or diploma degree, also the highest percentage of them hadn't attended training courses about both pain assessment and non pharmacological pain management methods. This finding agrees with (31), who carried out a study entitled "Utilization of non-pharmacological methods and the perceived barriers for adult postoperative pain management by the nurses at selected National Hospitals in Asmara, Eritrea" and showed that lack of knowledge was highly rated as important nurse related barriers for the utilization of non-pharmacological methods for postoperative pain management. Furthermore, this finding concurred with (27), who indicated that none of the studied nurses had satisfactory pre-intervention knowledge about non-pharmacological pain management methods. On the other hand, the current study findings disagree with (32), who carried out a study entitled "Non-pharmacological pain management: Nurses' knowledge, attitudes and practices in selected Hospitals at Makah El-Mukarramah" and showed that knowledge and practices of studied nurses were at a satisfactory level. About nurses' practices regarding applying non-pharmacological pain management methods for patients with cardiothoracic surgery, the current study showed that more than two-thirds of studied nurses had unsatisfactory total practices level regarding the application of non-pharmacological pain management methods, while only less than one third had satisfactory total practice level regarding it. From the researcher's point of view, the unsatisfactory practices regarding applying non-pharmacological pain management methods for patients with cardiothoracic surgery attributed to lack of studied nurses' knowledge, training, and experience years in the nursing field and cardiothoracic surgery department. The current study finding in the same line with (31), who showed that non-pharmacological pain relieving methods are less utilized by the nurses and there was a gap in the knowledge and attitude in pain management. Also, this result is supported by (28), who showed that most of the nurses didn't perform non-pharmacological pain intervention practices. On the other hand, this finding disagrees with (33), who carried out a study entitled "Non- pharmacological methods in relieving children's post operative pain" and revealed that 57% of nurses use non-pharmacological therapies routinely. The current study showed that there is a statistically significant relation between nurses' age, experience years in the nursing field and cardiothoracic surgery department, and total satisfactory knowledge. It is evident that these nurses' whose age

more than 30 years old and their experience more than five years in the nursing field and specialty had a more satisfactory knowledge level. These findings concurred with (34), who carried a study entitled "Influences shaping nurses' use of distraction for children's procedural pain", and recognized that nurses' experience is influential in the management of pain, and older nurses are more likely to use non-pharmacological techniques than younger nurses. Furthermore, they found a statistically significant correlation between nursing experience and knowledge of pain management techniques. Furthermore, these findings agree with (35), who carried out a study entitled "Relationship between knowledge, attitudes, and self-efficacy of nurses in the management of pediatric pain" and showed that nurses with more years of nursing experience were found to have a higher level of knowledge on pain management compared with those with fewer years of nursing experience. On the other hand, these findings disagree with (24), who showed that there was no significant statistical correlation between the study subjects in relation to their age, working unit, and years of experience in the nursing field and in ICU in relation to knowledge score. The present study findings showed that there is a statistical significant correlation between nurses' age, social status, nursing qualification, and their experience years with the total satisfied practice level. These findings would be in accord with (31), who revealed that all nurses' age, educational status, and experience in healthcare with a close relative had a significant difference in the utilization of non-pharmacological methods. The utilization of non-pharmacological methods is proportionate to the increase in age, experience, and educational level of the nurses. On the other hand, these findings contradicted (28), who revealed that nurses' education, work experience, and the unit in which they worked showed no statistically significant association with the few non-pharmacological pain relief approaches they used.

Conclusion

It can be concluded that about two-thirds of studied nurses had unsatisfactory knowledge and practice level regarding the non-pharmacological pain management for patients with cardiothoracic surgery, while the lowest percentage of studied nurses had satisfactory knowledge and practice level. Also, it was concluded that there was a positive statistically significant correlation of total nurses' knowledge score with total practice score about

non-pharmacological pain management, age of studied nurses, and nurses' experience years in the nursing field and cardiothoracic surgery department.

Recommendation

The nursing staff who work in the study settings need more training to improve and refresh their knowledge about non-pharmacological pain management.

Practical training programs and workshops are highly recommended to improve nursing performance regarding pain assessment and non-pharmacological pain management.

A booklet about non-pharmacological pain management should be available to the nursing staff at all hospital departments particularly at cardiothoracic surgery departments.

Further studies should be carried out on a large number of nurses for evidence of the result.

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