

Nursing Practices regarding Non-pharmacological Pain Management for Patients with the Cardiothoracic Surgery at Zagazig University Hospitals

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Abstract

Background: Patients with cardiothoracic surgery 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 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. **Aim of the study:** was to assess nurses' practices regarding non-pharmacological pain management for patients with cardiothoracic surgery at Zagazig University Hospitals. **Subjects and Methods: Research design:** descriptive exploratory design was used. **Setting:** The study was conducted in the postoperative cardiothoracic surgery department at Zagazig University Hospitals. **Subjects:** Convenient sample of all available nurses (55) working in cardiothoracic surgery wards and open heart ICU at Zagazig University Hospitals. **Tools of data collection:** An interview questionnaire and observational checklist were used to collect data. **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, 67.3% had unsatisfactory total practice regarding non-pharmacological pain management. There was a positive statistically significant correlation of total practice score with nurses' age, and nurses' experience years in the nursing field and at the cardiothoracic surgery departments. **Conclusion:** Nurses had an unsatisfactory level practice regarding non-pharmacological pain management. **Recommendations:** Workshops are highly recommended to improve nursing practices regarding pain assessment and non-pharmacological pain management for patients with cardiothoracic surgery. **Keywords** Nursing practices, 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, 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, costovertebral joints, and intercostal 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 complications post 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' practices greatly affect the use of non-pharmacological pain management methods⁽¹⁴⁾.

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 CVD 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 patients with cardiothoracic surgery 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 practices regarding non-pharmacological pain management for patients with cardiothoracic surgery at Zagazig University Hospitals.

Aim of the study:

The aim of the study was:

To assess nursing practices regarding non-pharmacological pain management for patients with cardiothoracic surgery at Zagazig University Hospitals.

Research questions:

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

Subjects and Methods:

Research design:

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

Study Setting:

The study was conducted in the postoperative cardiothoracic surgery department at Zagazig University

Hospitals, which composed of an open heart ICU contained 12 beds with 20 nurses and cardiothoracic surgery wards consisted of 56 beds with 35 nurses.

Study Subjects:

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.

Tool for data collection:

In order to fulfill the objectives of the study two tools were used to collect necessary data:

Tool I: An interview questionnaire: This tool comprised of: Nurses' demographic data: This part was concerned with assessing the demographic characteristics of nurses. It contained nine 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.

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 (Blenkharn⁽²¹⁾, Gelinis et al.⁽²²⁾, and Bader, Morsy & Ali,⁽²³⁾). 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 practice regarding pain assessment as analgesics history, previous pain experience and intervention used, using the facility of the pain assessment tool, assessing pain at regular intervals, documenting 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 TENS (21 items) and performing acupuncture (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.

Content Validity and Reliability:

Once the tools were prepared in their preliminary form, they were presented to a panel of five experts from different nursing specialties. Cronbach's Alpha used to measure the internal consistency (reliability of used tool) was 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 about 6 nurses. 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 tools, those who shared in the pilot study were included in the main study sample.

Administration and Ethical consideration:

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.

-The study protocol was approved by the research ethics committee at the Faculty of Nursing, Zagazig University. Each potential subject was informed about nature, purpose, and benefits of the study, and informed that his/her participation is voluntary before giving 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 would be confidential and used only for the purpose of the study.

Statistical Analysis:

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 \pm 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 indicated direct correlation & (-) sign indicated inverse correlation, also values near to 1 indicated 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 \geq 0.05 was considered statistically insignificant (NS).

Results:

Table (1): shows that studied nurses' age ranged between 22-50 with mean \pm SD=31 \pm 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 were residing in urban areas. Regarding nursing qualification, 63.6% of studied nurses had technical institute, 45.5 of studied nurses had experience \geq 5 years 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): shows that all studied nurses were assessing the patients about onset and location of the pain. While 76.4 %, 63.6%, and 52.7% of studied nurses assessed duration, intensity and quality of pain respectively. While slightly more than one-third (36.4%) of nurses assessing precipitating, alleviating, and aggravating factors of pain. In general, 56.4% of studied nurses assessed the pain for the patients with cardiothoracic surgery.

Table (3): Demonstrates that 41.8% of the nurses were using the facility's clinically-validated pain assessment tool, 85.5% of them were documenting the pain scale and vital

signs step. Totally 50.9% of studied nurses had satisfactory general practice regarding the pain assessment methods.

Table (4): Shows that 49.1% of the studied nurses had satisfactory practice level regarding applying warm compresses, 47.3% were applying cold compresses, 43.6% were performing a back massage, 14.5% were performing relaxation techniques, 34.5% were applying and caring for the patients using TENS, and 45.5% were performing acupressure. Also, 32.7% of the studied nurses had total satisfactory practice level regarding non-pharmacological pain management methods.

Figure 1: 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 (5): indicates statistically significant relations between nurses total practice and their demographic characteristics including age ($p=0.0001$), social status ($p=0.012$), nursing qualification ($p=0.0001$), experience years in nursing field ($p=0.001$) and also with nurses' experience in cardiothoracic surgery department ($p=0.0001$).

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 are concurred by El-husseiny et al⁽²⁴⁾, 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 Khalil⁽²⁵⁾, 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 Mwanza, Gwisai & Munemo⁽²⁶⁾, who showed that 58.7% of nurses had a general nursing diploma as their highest qualification. Also, disagree with Al Qadiere & Al Khalaileh⁽²⁷⁾, 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 males and 90.5% of them had a bachelor's degree in nursing science.

Regarding assessment of patients' complain about pain, the present finding showed that all the studied nurses assessed the onset and location of the pain. This finding congruents with Ramadan, Mohamed & Abd Elsalem⁽²⁸⁾, who revealed that all of the studied nurses (100%) assessed the location of the pain. Moreover, this finding is in the same line with Bader, et al⁽²³⁾, who revealed that more than three-quarters of the studied nurses assessed pain onset, while this finding contradicted with him

in some findings, as only 33% of studied nurses assessed the location of the pain.

Regarding the general nurses' practices about pain assessment methods for patients with cardiothoracic surgery, the current study finding reported that the majority of studied nurses documented pain scale and vital signs. This finding is supported by Kizza⁽²⁹⁾, who revealed that the majority of the participants who assessed pain were documented findings after assessment. On the other hand, this finding contradicted with Ramadan, et al⁽²⁸⁾, who showed that all nurses didn't document pain scale and vital signs during pain. Also, this finding contradicted with Watt-Watson, et al⁽³⁰⁾, who conducted a study entitled "Relationship between nurses' pain knowledge and pain management outcomes for their post-operative cardiac patients" and reported that there were no documentation practice among nurses caring for emergency ill persons.

About nurses' practice 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' training, and experience years in the nursing field and cardiothoracic surgery department.

The current study finding is in the same line with Kidanemariam et al⁽³¹⁾, who showed that non-pharmacological pain relieving methods were less utilized by the nurses and there was a gap in the

knowledge and attitude in pain management. Also, this result is supported by Khalil⁽²⁵⁾, who showed that most of the nurses didn't perform non-pharmacological pain intervention practices. On the other hand, this finding disagrees with Polkki et al⁽³²⁾, who carried out a study entitled "Non-pharmacological methods in relieving children's post-operative pain" and revealed that 57% of nurses used non-pharmacological therapies routinely.

The present study finding showed that there was a statistical significant correlation between nurses' age, social status, nursing qualification, and their experience years with the total satisfied practice level. This finding would be in accord with Kidanemariam et al⁽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.

Also, this current study result concurred with Wilson⁽³³⁾, who stated that many variables and factors may have relevance to nurses' applying non-pharmacological pain interventions practices, such as years of experience in the nursing field and years of experience in the cardiothoracic surgery department and nursing qualification, as the higher educational level, and the more years of experience, had more satisfactory practice level. On the other hand, these findings contradicted with Khalil⁽²⁵⁾, 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 more than two-thirds of the studied nurses had unsatisfactory practice level regarding the non-pharmacological pain

management for patients with cardiothoracic surgery, while less than one third of them had satisfactory practice level. Also, it was concluded that there was a positive statistically significant correlation between total nurses' practice score about non-pharmacological pain management and their demographic characteristics including age, experience years in the nursing field and cardiothoracic surgery department.

Recommendation:

Based on findings, the study recommended:

1. Training programs and workshops are highly recommended to improve nursing practices regarding pain assessment and non-pharmacological pain management.
2. A booklet about non-pharmacological pain management should be available to the nursing staff at all hospital departments particularly at cardiothoracic surgery departments.
3. Further studies should be carried out on a large number of nurses for evidence of the 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	31±9.06	
Range	22-50	
Gender:		
Male	2	3.6
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	10.5±9.4	
Range	1-30	
Experience years in cardiothoracic surgical departments:		
<5	30	54.5
≥5	25	45.5
Mean ±SD	7.8±7.9	
Range	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 2: Frequency and Percentage Distribution of studied nurses' practices regarding assessment of cardiothoracic surgery patients' complain (n=55):

Nurses' practices regarding assessment of patients' complain	Done		Not done	
	No	%	No	%
Onset of pain	55	100.0%	0	0.0
Location of pain	55	100.0%	0	0.0
Duration of pain	42	76.4%	13	23.6%
Intensity of pain(using quantities scale)	35	63.6%	20	36.4%
Quality of pain(e.g. .sharp, dull, throbbing)	29	52.7%	26	47.3%
Precipitating factors of pain	20	36.4%	35	63.6%
Alleviating Factors/aggravating factors of pain	20	36.4%	35	63.6%
Total nurses' practices regarding assessment of patients' complain				
-Satisfactory	31	56.4%		
-Unsatisfactory	24	43.6%		

Table 3: Frequency and Percentage Distribution of studied nurses' general practices regarding the pain assessment for the patients with the cardiothoracic surgery (n=55):

General nurses' Practices regarding pain assessment	Done		Not done	
	No	%	No	%
Ask about an Analgesic history	29	52.7%	26	47.3%
Ask about previous pain experience and intervention used	40	72.7%	15	27.3%
Accept the patient's description for pain	46	83.6%	9	16.4%
Uses the facility's clinically-validated pain assessment tool	23	41.8%	32	58.2%
Assess pain at regular intervals	39	70.9%	16	29.1%
Document pain scale and vital signs	47	85.5%	8	14.5%
Reporting of pain or any alarming signs	35	63.6%	20	36.4%
Listen to the patient carefully during the pain description	42	76.4%	13	23.6%
Total nurses' general Practices regarding pain assessment				
-Satisfactory	28	50.9%		
-Unsatisfactory	27	49.1%		

Table 4: Frequency and Percentage Distribution of the 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 acupuncture	25	45.5%	30	54.5%
Total nurses' practices regarding non-pharmacological pain management methods	18	32.7	37	67.3

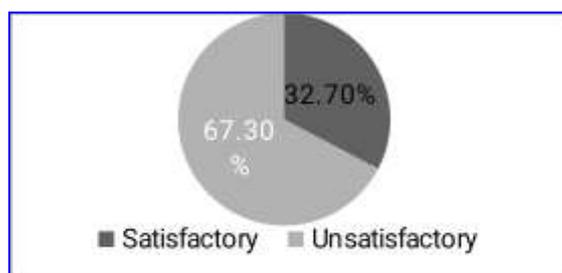


Figure 1: Total nurses' practice regarding non-pharmacological pain management for the patients with cardiothoracic surgery (n=55):

Table 5: Relation between nurses' total practices and their demographic characteristics

(n=55):

Demographic characteristics	Total practice				No	χ^2	p-value
	Satisfactory $\geq 65\%$		Unsatisfactory $< 65\%$				
	No.	%	No	%			
Age per years							
<30	4	11.43	31	88.57	35	19.8	0.0001*
≥ 30	14	70.00	6	30.00	20		
Gender							
Male	1	50.00	1	50.00	2	f	0.99
Female	17	32.08	36	67.92	53		
Social status							
Married	17	42.50	23	57.50	40	f	0.012*
Single	1	6.67	14	93.33	15		
Residence							
Urban	7	23.33	23	76.67	30	2.6	0.109
Rural	11	44.00	14	56.00	25		
Nursing qualification							
Bachelors	4	80.00	1	20.00	5		
Technical institute	4	11.43	31	88.57	35	20.3	0.0001*
Diploma	7	70.00	3	30.00	10		
Diploma +specialty	3	60.00	2	40.00	5		
Experience years in the nursing field							
<5	2	8.70	21	91.30	23	10.4	0.001*
≥ 5	16	50.00	16	50.00	32		
Experience years in cardiothoracic surgery departments							
<5	2	6.67	28	93.33	30	20.3	0.0001*
≥ 5	16	64.00	9	36.00	25		
Attended training courses about pain assessment							
yes	6	25.00	18	75.00	24	1.15	0.28
no	12	38.71	19	61.29	31		
Attended training courses about non-pharmacological pain management methods							
yes	4	19.05	17	80.95	21	2.8	0.09
no	14	41.18	20	58.82	34		

χ^2 Chi square test

f=Fisher exact test of significant

*significant p<0.05

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