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# PERCEPTION OF PAIN MANAGEMENT AMONG CARDIAC NURSES ON POST OPEN-HEART SURGERY

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## ABSTRACT

*Effective pain management enables the nurses to assist patients post open-heart surgery in their recovery process; however, the numbers of patient-controlled analgesic (PCA) usage is increasing yearly. Therefore, it is a need to explore cardiac nurses' perception on pain management in post open-heart surgery. A cross-sectional descriptive study was conducted with 113 respondents who fulfilled the inclusion criteria. A 23-item Toronto pain management inventory questionnaire was adapted and a visual analog score (VAS) from 0±100 was used to determine nurses' perception was then converted to percentage. The total mean score was (M= 63.10; SD ±4.10) which reported a moderate level of perception in pain management. Participants' age more than 30 years old and nursing experience more than 5 years have a better perception in pain management. The finding also shows participants with a lower educational background have a better perception in managing pain compared to the higher education level. Participants' age (t= -1.210, p values =0.22); gender (t= 0.518, p values =0.60); educational level (t= 2.231, p values =0.02) year of nursing experience (t= -2.90, p value 0.00); pain management education*

*(t= -0.281, p values 0.78) and duration of pain management education (t= 0.368, p values 0.71) respectively. In conclusion, the cardiac nurses possess moderate level of perception towards pain management in this private hospital. The nurses' education level and years of nursing experience reported to be significantly associated. Cardiac nurse with Diploma education level and nursing experience more than 5 years has a better perception in pain management.*

**Keywords:** *Cardiac nurses, perception, pain management; open-heart surgery; Intensive Care Unit.*

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## 1. INTRODUCTION

Many studies stress that nurses play a vital role to optimize one of the significant aspects of patient care which is effective pain management (Omran et al., 2014; Parizad et al., 2014). Nurses are often the first healthcare personal who attends to the patient once they are out from surgery; there is where the initial pain management for post-surgical intervention starts. The main complaint of patients who had experienced Coronary Artery Bypass Graft (CABG) surgery, is pain (Parry et al., 2010; Parizad et al., 2014). Therefore, nurses ought to manage

patients concern effectively. After cardiac surgery, the sternotomy and nerve injury between ribs which is created during surgery, and the discomfort and redness around the pleural area due to catheterization are one of the main sources of pain (Parizad et al., 2014). Nurses' knowledge and a comprehension, systemic and regular assessment of pain with proper documentation contributes to optimal pain relief (Parizad et al., 2014; Francis & Fitzpatrick). The best method to assist patients in their recovery process is using an appropriate post-operative pain management (Omran et al., 2014; Parizad et al., 2014; Japar, 2012). Open-heart surgery is a relatively major surgery, and the pain experienced by patients who have undergone the procedure may hinder their recovery process (Parizad et al., 2014).

In the hospital where the study was undertaken, nurses in the critical care area were required to assess the pain level within the first hour of admission, and subsequently reassess every four hours or when the patients verbalized their pain. The tools used for pain assessment were the numerical rating scale (NRS) of 0-10 with an optimum scale < 4/10 for non-ventilated patients and critical care pain observation tool (CPOT) of 0-8 with an optimum scale < 3/8 for ventilated patients. Pharmacological and nonpharmacological strategies were part of the intervention provided by a multi-disciplinary team in accordance with the pain management protocol. Studies showed that the natural history of pain during postoperative days 1 or 2 the pain intensity reaches its maximum limit and then gradually reduces over days 3 to 7 (Parizad et al., 2014; Kanstantatos et al., 2008).

If individuals experience unrelieved pain, it might hinder them from performing daily activities, as well as reduce their physical activities and independence (Parizad et al., 2014; Duenas et al., 2016). The statistics collected in the researcher's hospital showed that the number of patients who reported unrelieved pain despite intravenous or oral analgesia increased in 2016 (90.3%) and 2017 (98.4%). Therefore, a patient-controlled analgesia (PCA) is prescribed to enable patients to self-manage their pain. Effective pain management enables the nurses to assist patients in their recovery process. Hence, it is crucial to identify the perception of our nurses concerning the current practice of pain management for their post open heart surgery patients in association with educational level, years of nursing experience and pain management education.

## 2. REVIEW OF LITERATURE

### 2.1 Pain Perception by Nurses

A person's attitudes and biases viewpoint may affect pain management in different ways (Omran et al., 2014; Parizad et al., 2014; Duenas et al., 2016; McMillan et al., 2000). For instance, proper dosage of analgesic may not be prescribed for a patient who appears in a cheerful mood with no obvious signs of distress from either physical or emotional regardless of the patient might be experiencing severe pain. Nurses might presume that patients who exhibit slight or no sign of pain do not require analgesic as they might not be in pain (Parizad et al., 2014; Duenas et al., 2016). A qualitative approach of focus group discussion with surgical nurses (n=18) from two hospitals found out that nurses in Thailand prefer to manage patients' post-operative pain based on their own experience and

professional assumption rather than relying on evidence-based practice (Duenas et al., 2016; Chatchumni et al., 2015). Furthermore, nurses believe that patients should be able to tolerate pain to a certain level in their post-operative experience (Parizad et al., 2014; Duenas et al., 2016; Chatchumni et al., 2015). They also found out that there are nurses who believed that pain should only be managed if the patient encounters intolerable pain (Parizad et al., 2014; Duenas et al., 2016). The pain management rendered to the patient is solely dependent on the nurses' beliefs to reduce patients' pain including the type of medication served, and non-pharmacological interventions (Chatchumni et al., 2015).

In addition, patients often ask their family and relatives to convey their pain to the nurses, instead of verbalizing it directly to the nurses (Parizad et al., 2014; Chatchumni et al., 2015). It was found that there is a gap between professional knowledge and nurses' perceptions of patients in pain. Whereas in another study conducted, it was revealed that 99.2% of the nurses believed that patients demanded a higher dosage of analgesic drugs than needed, while only 27.9% patients believed that they required more pain medication (Bahrami et al., 2016). Clearly it shows that nurses often assumed patients need a higher dose of analgesic while patients did not require it (Parizad et al., 2014; Bahrami et al., 2016). This shows that there is a gap between nurses' perception of patient pain needs.

### 2.2 Pain assessment Tool

A study was conducted to analyze the knowledge and perception of pain assessment and management among 3753 intensive care nurses in Canada. The significant finding with

P<0.001 indicated that pain assessment tool is seldom used for patients who are unable to communicate (33%) compared to patients who were able to self-report (89%) (Rose et al., 2012). Only 29% of the respondents were aware of the pain assessment and management by the professional society guideline. Nurses were found not adhering to the recommended pain assessment tools for pain management, as proven by evidence-based practice (Duenas et al., 2016; Rose et al., 2012). Studies on pain after cardiac surgery revealed that pain is the major stressor among patients who undergo cardiac surgery (Duenas et al., 2016; Parizad et al., 2014; Bahrami et al., 2016). Despite all the resources emphasizing the use of guidelines and tools to assess the pain of patients, in cardiac surgery patients the attention paid to pain control is not sufficient (Parizad et al., 2014; Duenas et al., 2016). Patients reported poorly controlled pain and experienced moderate to severe pain after surgery (Duenas et al., 2016; Bahrami et al., 2016).

### 2.3 Nurses' Pain Knowledge

A study found that the knowledge of staff nurses needed to be improved concerning the pain management of postoperative care patients, as although 78.5% showed a positive attitude only 58 of the respondents (69%) possessed a moderate level of knowledge of pain education (Rose et al., 2012). This shows that there is a knowledge deficit among nurses in concerning the management of postoperative pain management (Bahrami et al., 2016; Rose et al., 2012; Ho et al., 2009). The lack of pain knowledge of cardiac nurses often results in ignorance concerning patients' post-operative complaints (Ho et al., 2009;

Ho et al., 2013). Ironically, another study found that 41% of the participants who were drawn from a sample of medical ward nurses in Malaysia had not attended any pain management course. Although 55% of the nurses received in-service training, only 6% of the participants obtained certificates in pain assessment (Soh et al., 2017). In a plan to enhance nurses' competency in pain management, few studies suggested the introduction of frequent in-service training revision courses related to pain management (Duenas et al., 2016; Soh et al., 2017). They also found that more experienced nurses tended to incorporate the pain management knowledge better (Soh et al., 2017; Lui et al., 2008). Few findings shown a knowledge deficit in pain assessment knowledge, and pain management (Leegaard et al., 2011; Al-Quliti & Alamri, 2015). In view to raise nurses' knowledge, providing frequent pain assessment course is necessary to improve their management in pain assessment and treatment.

### 2.4 Barriers in Pain Management

Pain management barriers faced in the emergency unit were categorized into two: healthcare system barrier and health care providers related barrier (Duignan & Dunn, 2008). Insufficient time, nurses' knowledge deficit, and administration issues falls under healthcare system barrier. The healthcare provider barrier includes attitudes of nurses, perception of analgesia, and under-assessment of pain (Duenas et al., 2016; Duignan & Dunn, 2008). Most patients often develop a wrong perception and belief about analgesic (Leegaard et al., 2011; Cogan et al., 2014). The fear of addiction, side effects of analgesia and prefer to take medication when the pain is unbearable results in a

situation where patients prefer to bear the pain rather than take analgesia to relieve their pain (Cogan et al., 2014). The hospital needs to provide healthcare personal and patient proper training to understand the usage of analgesia to eliminate the fear of analgesia (Duenas et al., 2016; Silva et al., 2013). Some of the researcher also mentioned that the burden in the overload of daily nursing routine, communication breach, lack of awareness on postoperative pain management, and management changes issues are the possible barriers to prevent a fruitful post-operative pain management (Glowacki, 2015; Meissner et al., 2015; Subramanian et al., 2012). Lack of patient assessment, negative point of view, incomplete documentation, and improper usage of analgesics contributes to the challenges faced by nurses all around the world in pain management (Duenas et al., 2016; Masigati & Chilonga, 2014; White, & Kehlet, 2010).

## 3. RESEARCH METHODOLOGY

### 3.1 Research Design and Sample

A cross-sectional quantitative descriptive study was conducted to identify the perception of cardiac nurses concerning pain management in post open-heart patients in a private hospital, Kuala Lumpur, Malaysia. The accessible population for this study were the registered cardiac nurses' who were working full-time in the selected hospital and will determine their perception concerning pain management as well as the demographic data for post open-heart surgery patients based on the Toronto Pain Management Inventory (TPMI). Total of 146 participants were calculated using the Raosoft sample size calculator, with a 5% margin of error, 95% confidence interval

and 50% distribution rate. Therefore, the sample size required was 103. A 10% (n=10) attrition rate was added to the sample size, which made the sample size to comprise 113 participants.

### 3.2 Research Instruments

The questionnaire consisted of two components: Part, A demographic data and Part B Toronto Pain Management Inventory (TPMI) questions. Part A, which is the demographic data, consisted of the participant's age, gender, years of nursing service, education level, and attendance of pain management training. Part B consisted of 23 TPMI questions using a VAS which was developed by Watt-Watson in 1987 to measure the nurses pain knowledge; however, as mentioned earlier, the question in TPMI was relatively to measure the perception on pain management rather than pain knowledge. For example, the question *"How often do patients tend to overstate their pain? (i.e. what percentage of the time)"*, *"How often do patients tell you without being asked that they are having pain?"* and *"How difficult is it on your unit to have analgesic orders changed when your patients continue to experience pain?"*. The modified TPMI questionnaire consisted of 23 questions with a VAS scale each rated on a scale of 0±100. The numbers were totaled and converted to percentage form. Questions aimed to explore nurses' perception in pain management inclusive of analgesia, patients' experiences of and responses to pain, and professional viewpoint such as nurses' self-perceived competence and colleague support. The medication used in the questionnaire was modified to suit the current institutional medication orders.

The essence of the questionnaires was verified by the Consultant Anesthesiologists in charge of the Acute Pain

Service, the Nurse Manager of the ICU and the Nurse Mentor in charge of nurse education at the ICU. The panel of experts assessed the validity and suitability of the contents, such as the language and wording of the questionnaire used by the participants in this study. The Cronbach alpha test was to check the reliability of the instrument. The value of 0.70 or higher was considered good (Polit & Beck, 2017). The alpha obtained by Cronbach was 0.94 which showed evidence of good reliability.

## 4. RESULTS AND FINDINGS

### 4.1 Descriptive Analysis

A total of 113 questionnaires were distributed to the participants and the respond rate was 100%. The data were tabulated and shown accordingly in the tables below. In the Table 1, the demographic data of 113 participants is shown. The demographic data included age, gender, education level, years of nursing experience, pain management education and duration of pain management education. Among the 113 participants, a total of 81 (71.7%) participants were aged ≤30 years old and 32 (28.3%) participant >30 years old. The mean and standard deviation of the age was (M = 29, SD = 4.38). The majority of the participants were female 107 (94.7%) and 6 (5.3%) male participants. In the context of education level, there were 62 (54.9%) participants who held a diploma in nursing while 51 (45.1%) participants had a Bachelor of nursing. There were 62 (54.9%) participants whose year of nursing experience was less and equal to 5 years, and 51 (45.1%) of the participants had more than 5 years of nursing experience. The mean and standard deviation of the years of nursing experience is (M = 6.46, SD = 4.29). A total of

99 (87.6%) participants claimed that they had attended pain management education and 14 (12.4%) did not attend the pain management education. Out of the 99 participants who had attended the pain management education which was held for less than half a day consisted of 85 (75.2%) participants, 8 (7.1%) participants attended one day education and 6 (5.3%) of the participants attended more than one day.

Table 1. Participants Demographic Data (n=113)

| Variables | Categories | n(%) | M±SD |
|---|---|---|---|
| Age (Years) | ≤30 | 81(71.7) | 29 ± 4.38 |
| | >30 | 32(28.3) | |
| Gender | Male | 6(5.3) | |
| | Female | 107(94.7) | |
| Education Level | Diploma | 62(54.9) | |
| | Bachelor of Nursing | 51(45.1) | |
| Years of Nursing Experience | ≤5 | 62(54.9) | 6.46 ± 4.29 |
| | >5 | 51(45.1) | |
| Pain Management Education | Yes | 99(87.6) | |
| | No | 14(12.4) | |
| Duration of Pain Management Education | Less than half day | 85(75.2) | |
| | One day | 8(7.1) | |
| | More than one day | 6(5.3) | |

### 4.2 Toronto Pain Management Inventory (TPMI) Percentage of Pain Management

Participants score their perception on pain management using the visual analog scale from 0 to 100. A cumulative score for the 23 TPMI questions was calculated for each participant and tabulated into percentage. Table 2 shows the participants highest to lowest score in percentage for each TPMI question. The highest score is 96.1 % and the lowest at 35.4%. Participants agreed that pain relief is directly related to the type of surgery undergone by the patient (Q4) with the highest score of (M = 96.1%, SD = 5.4). The usage of pain rating scale to assess pain (Q20) came in second highest with (M = 95.5%, SD = 8.6), participants (78%) routinely use pain ruler to assess pain in post-operative patients. Participants feel competent to manage patient pain effectively (M = 88.0%, SD = 14.3); moreover, they also feel their pain assessment and management knowledge is adequate (M = 86.0%, SD = 16.3).

Results with the score less than 50% include Q12, Q5, Q6, Q11 and Q9 are mainly participants' perception of patients' experiences in terms of postoperative pain except for Q12 which is included in the knowledge of analgesia. The lowest score of the TPMI question is pertaining to the patients experiencing severe pain post-surgery Q9 (M = 35.4%, SD = 14.5). As for Q7 of patients experiencing mild or less pain and Q8 moderate pain post-surgery (M = 70.4%, SD = 16.1) and (M = 53.4%, SD = 11.1) respectively. Q1, Q17 and Q23 scores were reversed in order to generate a final higher score (Watt-Watson et al., 2001).

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Table 2. Mean and Standard Deviation for each TPMI Item with Descending Orders (n=113)

| Toronto Pain Management Inventory | M (%) ± SD |
|---|---|
| Q4. To what degree is pain relief directly related to the type of surgery the patients has had? | 96.1 ± 5.4 |
| Q20. How often do you use a rating scale to assess pain (e.g. 0-10)? | 95.5 ± 8.6 |
| Q22. How competent do you feel in effectively managing patients who are having pain? | 88.0 ± 14.3 |
| Q21. How adequate do you feel your current knowledge is about pain assessment and management? | 86.0 ± 16.3 |
| Q23. What percentage of patients in hospital who take opioids for pain become addicted? * | 80.8 ± 7.6 |
| Q14. A 45-year-old construction worker still complains of severe incisional pain 2 days after surgery despite taking tablet paracetamol 1g QID. After assessment, would you give him the ordered oral Tramadol 50mg three times a day (TDS)? | 79.5 ± 15.7 |
| Q19. To what degree do physicians on your unit agree with your decisions about managing a patient's pain? | 78.5 ± 12.2 |
| Q18. To what degree do nurses on your unit agree with your decisions about managing a patient's pain? | 76.1 ± 11.6 |
| Q13. How often would you give surgical patients analgesics for their chronic pain if they can be distracted? | 76.0 ± 17.24 |
| Q17. How difficult is it on your unit to have analgesic orders changed when your patients continue to experience pain? * | 75.8 ± 11.4 |
| Q10. What percentage of the time would you give opioid analgesics orally where there is a choice of route? | 70.9 ± 21.0 |

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| | |
|---|---|
| Q7. What percentage of postoperative patients where you work experience mild or less pain? | 70.4 ± 16.1 |
| Q1. With effective pain management, what pain rating should patients experience after surgery? * | 64.6 ± 20.0 |
| Q3. How often do you agree with patients' statements about their pain? | 61.2 ± 15.4 |
| Q15. Mrs. N's Fentanyl has been increased within a range because of her unrelieved pain. She has begun to experience nausea and is given an antiemetic. Your nursing colleague suggests you should also decrease the Fentanyl dose. Would you follow this advice? | 60.5 ± 22.3 |
| Q2. How often do patients tend to overstate their pain? (i.e. what percentage of the time). | 59.2 ± 12.8 |
| Q16. Mr. Z, in spite of receiving Fentanyl 40 mcg/hr., continues to report moderate pain on his first postoperative day. Would you ask the physician for a higher dose? | 54.7 ± 21.3 |
| Q8. What percentage of postoperative patients where you work experience moderate pain? | 53.4 ± 11.1 |
| Q12. How often do you tell patients that they need to wait for their next analgesic? | 48.0 ± 18.1 |
| Q5. How often do patients tell you without being asked that they are having pain? | 48.0 ± 15.7 |
| Q6. How often do patients ask you voluntarily for an analgesic? | 43.8 ± 14.7 |
| Q11. What pain rating should patients have before the next analgesic dose is given? | 36.2 ± 12.3 |
| Q9. What percentage of postoperative patients where you work experience severe pain? | 35.4 ± 14.5 |

*Reverse score questions

### 4.3 Association Between Participants' Demographic Data with Participants' Perception Towards Pain Management in Post Open-heart Surgery

The association between patients' demographic data (age, gender, education level, and years of nursing experience, pain management education and duration of pain management education) and participants' perception towards pain management in post open-heart surgery is measured using the inferential analysis of independent t-test to test the p-value in Table 3. In order for the data to be significant $p < 0.05$. The mean and standard deviation of participants age towards pain management perception was (62.80 ± 3.91) for age group ≤30 years old which is lower compared to the age group > 30 years old (63.84 ± 4.55). There were no significant differences between the two age groups and pain management perception ($t$ = -1.210, p = 0.22) $p > 0.05$. The mean and standard deviation of pain management perception for female participants (63.14 ± 4.08) is slightly higher compared to the male participants (62.25 ± 4.82). There were no significant differences of the two gender groups towards pain management perception ($t$ = 0.518, p = 0.60) $p > 0.05$. The mean and standard deviation of participants who owns a Diploma (63.86 ± 3.99) is higher compared to bachelor holder (62.16 ± 4.09). There is a significant difference of the two education level groups towards pain management perception ($t$ = 2.231, p = 0.02) $p < 0.05$. Participants whose nursing experience is more than 5 years (64.29 ± 4.20) relatively have a higher mean and standard deviation compared to participants who have nursing experience less or equal to 5 years (62.11 ± 3.78).

The finding ($t$ = -2.900, p = 0.00) p < 0.05 determine that there is a significant between participants years of nursing experience towards pain management perception. Pain management education mean and standard deviation for participants who attended the teaching was (63.05 ± 4.27) and participants who did not attend were (63.39 ± 2.77). Hence, ($t$ = -0.281, p-value = 0.78), there is no significant as the p > 0.05 between participants who attended and fail to attend the pain management education towards pain management perception. Subsequently, the duration of pain management education means, and standard deviation attended by participants by means of less than half day were (63.19 ± 4.23), participants who attended the pain management education for one day or more than one day were (62.73 ± 4.44). There is no significant between participants duration of pain management education towards pain management perception ($t$ = 0.368, p = 0.71) p > 0.05.

Table 3. Participants' Total Mean Score of Pain Management Perception with Demographic ata (n=113)

| Variables | Categories | M±SD | $t$ | p-value |
|---|---|---|---|---|
| Age (Years) | ≤30 | 62.80 ± 3.91 | -1.210 | 0.22 |
| | >30 | 63.84 ± 4.55 | | |
| Gender | Male | 62.25 ± 4.82 | 0.518 | 0.60 |
| | Female | 63.14 ± 4.08 | | |
| Education Level | Diploma | 63.86 ± 3.99 | 2.231 | 0.02* |

| | | | | | |
|---|---|---|---|---|---|
| | Degree | 62.16 | ± 4.09 | | |
| Years of Nursing Experience | ≤5 | 62.11 | ± 3.78 | -2.900 | 0.00* |
| | >5 | 64.29 | ± 4.20 | | |
| Pain Management Education | Yes | 63.05 | ± 4.27 | -0.281 | 0.78 |
| | No | 63.39 | ± 2.77 | | |
| Duration of Pain Management Education | Less than half day | 63.19 | ± 4.23 | 0.368 | 0.71 |
| | One day and more than one day | 62.73 | ± 4.44 | | |

*p - value < 0.05- significant
**p- value > 0.05- non- significant

## 5. DISCUSSION

In accordance with the findings, out of 113 participants 81 (71.7%) participants are aged ≤30 years old and 32 (28.3%) participant >30 years old. Majority of the participants are female 107 (94.7%) and 6 (5.3%) male participants. In the context of education level, there are 62 (54.9%) participants who hold a diploma in nursing while 51 (45.1%) participants own a Bachelor of nursing. There are 62 (54.9%) participants whose year of nursing experience is less and equal to 5 years, and 51 (45.1%) of the participants have more than 5 years. A

total of 99 (87.6%) participants claim that they have attended pain management education and 14(12.4%) did not attend the pain management education. Among the 99 participants who have attended the pain management education, the duration of pain management education which was held for less than half a day consist of 85 (75.2%) participants, 8 (7.1%) participants attended one day education and 6 (5.3%) of the participants attended more than one day. It was found that participants' age > 30, with more than 5 years of nursing experience and diploma holder have better perception in pain management.

The findings of the study reveal that there Is a significant difference between cardiac nurses' perception in pain management and their education level with $p < 0.05$. Such significant reflects education level play an important role in determine nurses pain management perception. It was also reported that pain management is associated with education level (Ho et al., 2009). There is a significant difference between the initial level of nursing education which is Diploma and Bachelor and the knowledge of pain management with $p < 0.05$ in another study (Salameh, 2018). In Malaysia, the period undergone to obtain Diploma is 3 years and Bachelor is 4 years course, whereby the year difference is only 1-year. In our opinion, the reason Diploma holders have a better perception in pain management compared to Bachelor holder is due to the 1-year difference that the Diploma holders have an additional one year in the clinical setting or work setting to learn and master pain management, the interaction between nurse and patients helps Diploma holder to enhance their pain management experience. Furthermore, that lecturers in the institution may not have

sufficient time to educate students in either the concept of pain or the proper way of managing pain (Lui et al., 2008).

Other scholars further supported that nurses' level of knowledge and pain management assessment will be affected due to the inadequate pain education time allocated in the curriculum and in hospital (Watt-Watson et al., 2001; Salameh, 2018). In contrary, Yava et al. claimed that nurses with a Bachelor education are better than Diploma education in terms that their score in pain knowledge is higher and with a significant of $p < 0.05$ (Yava et al., 2013). However, the current study shown that participants with Diploma background have a better perception in managing pain compared to the participants who were bachelor holders. The finding of Yava et al. pointed out that Bachelor nurses are able to score higher in the pain knowledge compared to Diploma nurse as Bachelor is considered a higher education level compared to Diploma (Yava et al., 2013). However, we have to take into consideration that the content of the training program for Diploma and Degree is different as the duration to complete the program is differs by 1-year. Therefore, Degree nurses may score better in pain knowledge, but it does not mean that they will have good pain perception in pain management.

Participants whose nursing experience is more than 5 years relatively have a better perception in pain management compared to participants who have nursing experience less or equal to 5 years. There is a significant between participants' years of nursing experience towards pain management perception as $p < 0.05$. According to the study findings, nurses with more than 5 years of experience possess a better

perception in pain management can be explained through the experience gain throughout the years of nursing experience. Nurses who have longer years of nursing experience are exposed to more pain assessment and management situation compared to nurses who have fewer years of nursing experience. The skill of pain management is developed throughout the years of nursing experience with the guidance of different pain management style.

In our opinion, the more years of nursing experience a nurse has, the more confident they will be during the management of patient's pain. Furthermore, nurses who have more years of experience may have a better knowledge of the analgesic drug and they are able to provide suggestion if there is a need to increase or change patient's medication. Nevertheless, the results of the study from both Ho et al. (2013) and Soh et al. (2017) reported that there is no significant difference in pain management between years of service which is not aligned with the findings of the current study (Ho et al., 2013; Soh et al., 2017). The findings may deduce that years of nursing experience does not indicate that nurses will have a better pain management perception in the long run. Moreover, there might be a possibility that nurses may not have any continuation of pain management education or course in years and their ability to assess and manage pain remains status quo from where they started the nursing profession. Another reason contributing to such finding will be nurses with longer years of nursing experience may have developed his or her pain assessment and management style and is less susceptible to new information or practice pertaining to pain management.

Pain management education is often believed to help nurses improve in their pain management for their patients. However, there is no significant difference between participants who attended and fail to attend the pain management education towards their pain management perception as the $p > 0.05$. Johns Hopkins Pain Curriculum Development Team reckoned that in order to strengthen pain management in nurses, pain education and continuation of education in practice is vital (Mezei & Murinson, 2011). As seen in few studies, there is no significant relationship between the pain management knowledge and the pain education attended among the medical ward nurses in Malaysia (Soh et al., 2017), and Saudi nurses (Samarkandi, 2018). The relationship of pain management and pain education which is not significant may be due to the standard of education provided does not improve nurses' knowledge in their pain management. The study finding shown that the duration of pain education attended by 85 out of 99 participants is less than half a day while only 14 of them attended pain education for one day and more than one day. The duration of the education which was less than half a day might be inadequate, or the content of education is not all rounded which reflects that there is no significant difference.

On the other hand, few scholars suggested a significant association between nurses' knowledge and pain management course (Utne et al., 2018; Germossa et al., 2018; Eid et al., 2014) with the in-house education provided are 2 continuous days (16 hours) of face-to-face training, facilitate self-learning and provide reading materials, and 8-hour refresher course after 4 weeks (Germossa et al., 2018). Such approach of education left a huge impact on the participants and should be introduced to

the hospital or other institution as the basic pain management education. Nurses who had attended pain management continuation education programs, scored better compared to those who did not attend in terms of pain education and patient counsel session (Eid et al., 2014). A comprehensive pain education session is proved to benefit nurses in their pain assessment and management for their patients.

## 6. CONCLUSION, IMPLICATIONS AND LIMITATIONS

The findings of the study show significant difference between the perception of cardiac nurse concerning pain management in post open-heart surgery in the education level and years of experience. There is no significant difference between the perception of cardiac nurse and pain management education. Study findings show that cardiac nurses who age > 30 with more than 5 years of nursing experience and in the group of Diploma holder lower education level had better perception. The unexpected finding of nurses who are Diploma holder reported having better perception compared to Bachelor holders. This is the opposite of findings in most research papers, as Bachelor holder level of education is higher than Diploma. In this study, the years of nursing experience is significant to the cardiac nurses' pain management perception which is inconsistent with most studies. Whereas pain management education should show a significant difference reported to have no significant to the cardiac nurses' perception in this study. In short, the researchers would like to recommend the next coming research to look into the education level, years of nursing experience and pain management education.

Cardiac nurses are the first line of healthcare personnel who attend to the patient immediately in their post open-heart surgical intervention. Therefore, it is important for cardiac nurses to help patients manage post-operative pain with proper and effective pain management. As nurses pain management perception differs from one individual to another it is important to find out their viewpoints and make more improvement in pain management education. The study shows that cardiac nurses who are aged more than 30 and with more than 5 years of experience and lower education level have better perception nevertheless the pain education does not make a significant difference to the findings.

This study was conducted in a private hospital in Kuala Lumpur where a specific group of nurses was taken as the study population where the findings may not be able to represent the general population of cardiac nurses in Malaysia. Although the study population was 113 participants, the findings only reflect the perception of cardiac nurses of a particular hospital. Another limitation was the time allocated for the questionnaire to be answered by the participants is not sufficient as participants often request more time and ask permission to bring back on the next day as most of them complained of exhaustion after work and some would like to read the questions in detail. Those who managed to answer the questionnaire in the stipulated time may have rushed through it and did not read the questions carefully. The lack of literature review pertaining on nurses' perception in pain management in both qualitative and quantitative research is another limitation of the study. Such constrain limits the viewpoint of the researcher to look into nurses' perception in pain management.

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