

Satisfaction of Postoperative Patients on Pain Management Program its Relationship to the Knowledge and Attitudes of Chinese Nurses: A Cross-Sectional Survey

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Abstract – This study is a cross-sectional survey of the satisfaction of post-operative patients its relationship to the knowledge and attitudes of Chinese nurses on pain management. Data were sourced out from two groups of respondents participated in the study, 75 post-operative patients and 97 in-service nurses from the health institutions China. The study was conducted for five-months. Ethics protocols were observed before and after the conduct of the study. Findings showed that post-operative pain management program among the participating medical institutions in China were assessed to have moderate level of satiation by the patients. All the components namely pain relief experience, care provided by the nurses, education provided as to pain management, and therapeutic dialogue provided by the nurses were all assessed by postoperative Chinese patients at a fair level. Meanwhile, gender and education of post-operative patients can be considered as factors in the planning and implementation of pain management program. Consequently, similar to studies conducted worldwide, Chinese nurses do not establish yet an optimal level of knowledge and attitude towards pain management. Meanwhile age, experience, education are factors on the knowledge and attitude on pain management among nurses. Finally, positive moderate relationship is established between patient satisfaction and knowledge and attitudes of nursing staff towards pain management. The findings of these study call for action and reform in the implementation of pain management program focusing on the major role and development of 21st century nurses. Practical implications of the study are discussed.

Keywords: Post-Operative Pain, Pain Management, Chinese Nurses, Cross-sectional Study, Program Evaluation

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INTRODUCTION

On humanitarian aspect, the medical and health practitioners need to alleviate patients suffering. Pain results to societal, economic, and personal burden. Doctors and nurses are key players in the implementation of pain management programs. Experiencing pain is major reason why people seek medical attention of healthcare professionals (Gallegom 2016; Goldberg et al, 2011; Ung et al, 2016). Pain may originate from different sources. One of which is from surgical operations due to lacerations. It is worth considering that reducing patient's postoperative pain can reduce their risk of developing postoperative complications. The patients under the process of surgical operations are continuously experiencing pain reported to have an incidence of 29.7% for those who are experiencing moderate-to-sever pain while a statistic of 10.9% belonged to those who are experiencing severe pain (Dolin and Cashman, 2005; Dolin, Cashman, & Bland, 2002; Iamaroon et. al., 2019; Michel et al., 2003; Samwel & Boniface, 2019).

In the global context, among developed nations, it was reported that there are around 86% of hospital patients have experienced postsurgical pain and 75% of them reported severe to moderate-severe-pain throughout their immediate postoperative period. The persistent pain after the process of major abdominal surgery leads to reluctant deep breath and as a result may be predisposed to postoperative pneumonia which contributes to dysfunctional order and prolonged convalescence (Botti et al, 2004; Ho, Smith, Pockney, Lim, & Attia, 2014; Ismail et al, 2018; Moraca et al, 2003; Sydow, 1989). Pain management is a civil liberty or human right, ailing patients must be able to have orientation and background about the pain they are experiencing. The information offered to them should be properly managed. Provision of pain treatment medications is their

fundamental right to have access to quality health services (Beard & Aldington, 2012; McDonald & Rapkin, 2012; Merskey & Bogduk, 1994). It is therefore necessary to take important steps in order to ensure the people suffering from pain can have avail and access proper and adequate pain treatment and ultimately reducing the gaps and disparities observed among pain management programs (Eid, Manias, Bucknall, & Almazrooa, 2014; Mocerri & Drevdahl, 2014; Tsai, Tsai, Chien, & Lin, 2007; Wang & Tsai, 2010).

According to the International Association for the Study of Pain (IASP), pain is characterized as an uncomfortable or unpleasant sensation in the body associated with the potential or actual tissue damages (Merskey & Bogduk, 1994). The inadequacy of pain management is the main reasons of human and economic costs among postoperative patients, families and societies (Boudreau et al., 2009; Brennan, Carr & Cousins, 2007; Penney et al., 2016; Schopflocher, Taenzer, & Jovey, 2007). The ineffective process of postoperative pain management leads to psychological, physiological, financial and ethical consequences (Ahmed, Latif, & Khan, 2013; Bhatia, Sen, Mandal, & Batra, 2019; Ismail, Siddiqui, & Rehman, 2018; Keihani, Jalali, Shamsi, & Salari, 2019; Squillaro, et al., 2019). Meanwhile effective postoperative pain management enhances comfort of patients, increases their level of satisfaction, helps a lot in more improve physiotherapy as well as earlier rehabilitation having improved postoperative outcome (Fearon et al., 2005; Kehlet and Holte, 2001; Kehlet, 2018; Kim et al., 2017; van Boekel, 2017).

Postoperative pain is the utmost fear of many patients after surgical operations. It is one of the most unpleasant experiences of human beings which promoted them to seek medical consultation and assistance. The nature of pain condition being subjective and unique affects human disposition and wellbeing in all aspects. Hence, an optimal pain management program necessitates adequate understanding, affective and psychomotor domains in dealing with postoperative patients.

Providing adequate and effective pain management is the primary concern of healthcare services centres. Notable advancement has been reached in many years by understanding pain and its management but despite the progress, the evidences on pain management through psychological rehabilitation is still sub-optimal (Jafra and Mita, 2018; Kehlet, 2018; Gan et al., 2018) considering that postoperative pain treatment is a major component to good quality health care. Much has to be done in order for health practitioners serve the most convenient and appropriate pain management to postoperative patients guided with the values of caring, love, and empathy. The excuses for inadequate pain control management is not acceptable because it is clinically unsound, unethical, and economically wasteful (Block et al., 2003; Jha et al., 2008).

Although there are advancements of pain management approaches and modalities, many patients are still suffering. This may be attributed to several factors and variables. This study hypothetically attributes to inappropriate implementation of pain management program which is related to nurses' attitudes and knowledge in dealing with postoperative patients. Therefore, this study aims to provide clearer perspective on how the pain management among postoperative patients is implemented in mainland China in relation to the attitudes and knowledge of nurses. In such a way, this study will provide practical recommendations to further strengthen the delivery of health services among hospitals focusing on the roles of the health practitioners as implementers of pain management. Likewise, this study hopes contribute to the existing body of literature regarding the better and appropriate implementation of pain management among postoperative patients. On the part of the postoperative patients, this study hopes to benefit them considering that they are the primary customer of health services. They will be provided caring and relaxing treatments on the process of psychological and medical healing provided by appropriate pain management. This study is being proposed with the major reason to ease the pain suffering of postoperative patients.

LITERATURE REVIEW

Approaches for Postoperative Pain Management

At present, there are plethora of studies regarding the approaches considered by medical experts to properly initiate pain management among post-operative patients with the breakthrough goal of lessening if not totally eliminating the pain patients experienced (Becker et al., 2018; Brant et al., 2017; Corti, 2014; Drewes et al., 2017; Eaton et al., 2018; Gordon et al., 2016; Gravess et al., 2017; Hunnicutt, Tijia, and Lapane, 2017; Lemay et al., 2017; Manworren, 2015; McCracken, & Morley, 2014; Nahin, et al., 2016; Pasero, Quinlan-Colwell, Rae, Broglio, & Drew, 2016; Tompkins et al., 2017).

Specific studies such as of Meissner et al. (2015) who explored the priorities for change on improving post-operative pain management. It was confirmed that adequate pain management is necessary where key priorities are laid down. First, involvement of patients on the decision-making process regarding the pain treatment is necessary particularly when significant decisions are considered. This requires good exchange of communicator between the physician, nurses and patients. Secondly, updated professional development and trainings of the team is needed which will increase their knowledge, attitudes and skills to provide care to patients. Third, there is a need to consider the scope of maximizing the treatment for instance the use of synergistic analgesia to address pain. Fourth, organizational dynamics to provide other functional alternatives for patients such as improving the efficiency pain management program, dealing with technological advances will increase patients' satisfaction and enhance performance. Consequently, Ingadottir et. al. (2017) considered the important role of patient's education on pain management hence, development of computer-based game intended for surgical patients for them to learn about postoperative pain management. The computer game was considered efficient method of

learning about pain management among patients. More so, Kukimoto et. al. (2017) conducted systematic review analysis on the effect of message therapy on pain and anxiety after surgery. It was revealed that an alleviating effect is observed in the post-operative pain. However, limits have shown on the conclusion due to limited number of studies reviewed.

Among the factors responsible for inadequate pain management, include inadequacy of training, lack of knowledge, lack of caring attribute and accountability which lead to poor post-operative pain competency assessment among the health providers (Aziato & Adejumo, 2014; Joshi, Schug and Kehlet, 2014; Rantala et al, 2014; Taylor and Stanbury, 2009).

Studies in the Chinese context such as Li et al (2019) investigated post-operative pain management approaches among medical institutions in China exposed the inadequacy of standards and protocols showing that there is limited knowledge and involvement of nurses in pain management. Accordingly, as to the approach of pain management, Wu et al (2016) recommended the use of acupuncture on postoperative pain management among Chinese patients. Consequently, Zhu et al (2017) examined the postoperative pain self-management behaviour among Chinese who underwent knee or hip arthroplasty. It was found out that pain intensity felt is negatively correlated to self-management behaviour score. Personal profile variables such as gender, age, and education are predictors of pain management behaviour.

Despite the present of many studies on the approaches for postoperative pain management, limited studies are carried out in the Chinese context. Hence this study will provide significant implications to improve health delivery system among medical institutions in the world.

Attitudes and Knowledge of Nurses towards Pain Management

Studies on the nurses' attitudes and knowledge towards pain management are evidential in the literature across the world (Al Qadire & Al Khalaileh, 2014 ; Bach, Forman, & Seibaek, 2018; Brant et al, 2017 ; Duke, Haas, Yarbrough, & Northam, 2013; Fang et al, 2017; Francis & Fitzpatrick, 2013; Hroch et al, 2019; Peterson et al, 2019; Pretorius, Searle, & Marshall, 2015; Smeland, et al 2018; Tse & Ho, 2014). A significant study of Shindul-Rothschild (2017) disclosed that staffing, hospital characteristics, and nurses caring attitude are related to patients' perception on pain management program. Hence, nurses' communication style and positive psychological attributes are predictors of successful pain management program. In this study, the attitude and knowledge of nurses were explored. In such a way, it will provide necessary implications for more effective delivery of pain management among Chinese patients. Studies regarding nurses' knowledge and attitude were reviewed in this study to provide important gaps. The nurses are health practitioners spend much time of engagement with patients. Their attitude and knowledge towards pain management reflect the quality of their services rendered to patients in pain. This implies that nurses take share in the opportunity to improve the health delivery system which can provide relief to these patients in pain (WHO, 2008; Fang et al, 2017; Francis & Fitzpatrick, 2013; Hroch et al, 2019; Peterson et al, 2019). Nurses play a major role in pain assessment and advising by following the protocols and standards of pain management program particularly on surgical wards or in post-operative recovery period. They provide significant professional care in the setting of post-operative care (Abdallahmin et al, 2008; Bell and Duffy, 2009; Brant et al, 2017; Shoqirat, 2015; Tarjoman et al, 2019; Van Niekerk & Martin, 2003).

However, the studies also underlined nurses' limited knowledge towards pain management leading to incapacity and inadequacy to approach pain experience by patients which reflect the failure in the implementation of effective pain management program. Despite the plethora of studies referring to nurses attitude and knowledge towards pain management, limited knowledge is known on how healthcare providers and nurses in China approach pain management considering that different healthcare settings require different pain management approach. Hence, this study ventured on the implementation of pain management among postoperative patients in relationship to nurses' knowledge and attitude.

Context and Research Gap

China is one of the largest counties of the world with huge population. Providing healthcare services to its population is considered very important initiative of the government (Li et al, 2017; Liu, Vorherms, and Hong, 2017; Tan, Liu and Shao, 2017). Despite studies presented, limited literature has been conducted to explore the possible outcomes of post-operative pain management received by patients among Chinese medical institutions (Chung & Lui, 2003; Fang et al, 2017; Tong et al, 2019). Likewise, although advances on knowledge referring to pain management are uncovered, studies are continuously reporting inadequacy of pain management among post-operative patients (Gan et al, 2014; Gan, 2017; Liu and Petrini, 2015; Tompkins, Hobelman and Compton, 2017; Xie et al, 2019; Yu et al, 2016). Having this as a concern, there is a need to study the outcomes of postoperative pain management in mainland China in relation to nurses' knowledge and attitudes. Hence, this study aimed to assess the implementation of psychological rehabilitation of postoperative pain among patients its relationship to the knowledge and attitudes of nurses in pain management.

OBJECTIVES OF THE STUDY

This study fundamentally assessed the implementation of psychological rehabilitation of postoperative pain among patients and its relationship to the knowledge and attitudes of nurses in pain management. It specifically aims to: (1) Describe the pain management outcomes for Chinese postoperative patients as to their: pain expectation; pain intensity; pain interference with function, patient education; patient satisfaction; and adequacy of pain medication; problems encountered; (2) Describe the knowledge and attitudes of the nurses towards pain management; (3) Ascertain the differences on the satisfaction of postoperative patients and the nurses knowledge and attitudes towards pain management when grouped according to their profile variables. Determine the relationship between patient satisfaction on psychological rehabilitation and knowledge and attitudes of nursing staff towards pain management.

The first research inquiry shed light to the outcomes of the current pain management program of Chinese hospitals in China. It looked at the Chinese patient perspectives on their pain expectation, the pain intensity they experience, education, and their level of satisfaction on the services will be provided to them. In this part of the study, it is anchored on the theory of program evaluation (Brousselle and Buregeya, 2018) where it assessed whether pain management program is designed in such a way it achieves its intended outcomes. Hence, the present status of pain management will be improved since there will be propose interventions to be offered. Secondly, to have clearer perspective of the psychological rehabilitation, the attitudes and skills of nurses were assessed being the frontline of health services providers. It is important to assess their level of attitudes and skills towards pain management since they are directly involved in providing caring services to patients who are in the postoperative pain experience. This study answered the level of knowledge and attitude Chinese nurses possessed.

The third and fourth research objectives determined the significant differences and relationship between patient satisfaction to the knowledge and attitudes of nursing staff towards pain management. With this specific research objective, it helped to determine the causal effect existing. This study hypothesizes the relationship between the variables. Hence, this study will provide significant theatrical and practical implications to pain management programs implement by medical health institutions in the world.

MATERIALS AND METHODS

Research Design

The study employed descriptive cross-sectional design. The study was conducted in medical, surgical, and gynaecological patients among the selected hospitals in China. Cross-sectional survey involved the process of collecting data to generate inferences from a population (Constantini, Viterbori, and Flego, 2002; Darawad et al, 2015; Lavrakas, 2008).

Respondents Sampling Criteria and Ethical Consideration

Eight tertiary hospitals were randomly selected from fifteen hospitals in Beijing, China. Random selection process of surgery wards was performed. In selecting the postoperative patients the following inclusion criteria were followed based from Shen, Sherwood and McNeil (2008) sampling inclusion criteria: a) at least 18 years old and above; b) has been hospitalized within the period of study; c) on the second postoperative day; d) establish consciousness; e) capable of communicating in Chinese language. Identification of population and sample size was conducted for 5-month period. Moreover, selection of nurses to participate in the study was based on total population of the identified hospitals in Beijing. Only the registered nurses from the surgery wards of the selected hospitals were sampled. Calculation of sample size was based on Raosoft sampling size calculator set at 5% margin of error, 90% level of confidence, 50% response distribution.

Grounded on ethical consideration, all data gathered from the participants were treated confidentially. A written request was sent by the researcher and approved by the authorities regarding the conduct of the study. The data privacy form was also reviewed by the concerned authorities as well as ethics protocol was reviewed by the ethics committee. Hence, the approval of the hospital's institutional review board and data protection authority were secured. To observe anonymity, names of hospitals were not mentioned in this study.

As to the post-operative patient's respondents sampling background, Table 1 presents the frequency and percentage distribution of the respondents of the study. Majority of the respondents are female. Large portion of the respondents is married, have finished high school level, have underwent surgery on urological, abdominal, and thoracic, and have no analgesic drug.

Table 1. Sampling Background of the Post-Operative Patients Respondents

Variable	Category	Frequency (n=75)	Percentage
Sex	Male	32	43
	Female	43	57
Marital Status	Unmarried	12	16
	Married	38	51
	Divorced	14	19
	Widowed	8	11
	Not specified	3	4
Mean Age	49.56		
Education	Primary Schooled	7	9
	Middle Schooled	15	20
	High Schooled	28	37

	College Education	25	33
Previous Surgery	Yes	47	63
	No	28	37
Operation	Urological	14	19
	Abdominal	13	17
	Orthopaedic	8	11
	Thyroid	8	11
	Vascular	6	8
	Mammary	5	7
	Thoracic	11	15
	Not specified	10	13
Type of Analgesic	No Analgesic Drug	28	37
	Nonopoids	11	15
	Weak opiods	9	12
	Strong opiods	27	36
	Not specified	3	4

Meanwhile, as to the sampling background of the nurses respondents, Table 2 presents that most of the respondents are female, in 21-30 years old age bracket, have been in the nursing profession for 3-5 years, have attended seminar in pain management, have no advance degree, and are always involved in caring patients in the surgery wards.

Table 2. Sampling Background of Nurses Respondents

Variable	Category	Frequency (n=97)	Percentage
Sex	Male	25	26
	Female	72	74
Age	21-30 years old	33	34
	31-40 years old	30	31
	41-50 years old	18	19
	51-60 years old	16	16
Work Experience in Nursing Profession	Less than one year	10	10
	1-2 years	21	22
	3-5 years	36	37
	6-10 years	21	22
	11-15 years	9	9
	More than 15 years	0	0
Attended Seminar on Pain Management?	Yes	70	72
	No	27	28
Have an advanced degree?	None	43	44
	Yes	38	39
	Yes but not nursing	16	16
Frequency of Caring for Patients	Always	36	37
	Often	35	36
	Seldom	26	27
	Never	0	0

Data Gathering Procedure

Before gathering the data, the nursing departments of each participating hospital were requested for their approval for the conduct of the study. Date and time of gathering were scheduled. The head nurse and the data collector helped to identify those patients who will meet the inclusion criteria. After obtaining verbal and written consent, as per protocol, the data collector read the items to the participants. Their responses were recorded. Meanwhile, for the nurses as the respondents of the study, they were asked to answer the standardized questionnaire regarding their knowledge and attitudes towards pain management. Figure 1 presents the phases of data collection.

Figure 1. Phases of Data Collection Procedure

Activities Conducted	Timeline
Phase 1. Scheduling of Visit and Survey / Ethics Protocol Review	One month
Phase 2. Data Collection/ gathering	Two months
Phase 3. Tabulation, Data Cleaning, and Statistical treatment	One month
Phase 4. Analysis and Interpretation/ Report Witting	One Month
Total	Five months

Research Instruments

To assure that the instruments were reliable, they were subjected to content validity by technical experts composed of anaesthesiologists, three nurses, and one nurse professor in a university.

During the process, translations of specific terms in Chinese was conducted to improve the questionnaire. The time of completion of the instrument was tested and 20 minutes was adopted.

Socio-Demographic Profile Form

To elicit the data on the profile variables of the postoperative patients and nurse respondents, the socio-demographic forms were used to identify the personal profile. For post-operative patients, the profile elicited were sex, marital status, age, education, previous surgery, operation, and type of analgesic. In lime manner, for the nurse's respondents, their sex, age, years of experience were elicited.

Measure of Post-Operative Patients' Satisfaction

The measure of the post-operative patients' satisfaction was adopted from the items of Shen, Sherwood and McNeill (2008). The instrument was adapted and modified to the context of the study. The instrument assessed the Patient Satisfaction as to the outcomes of Pain Management Programme as to the following: Pain relief experience, Care provided by the nurses, Education provided as to pain management, and Therapeutic Dialogue provided by Nurses. it was answered with five-point liker scale with 1 as the lowest and 5 as the highest.

Measure of the Knowledge and Attitude of Nurses towards Pain Management

The measure the level of knowledge and attitude of nurses towards pain management will use the revised version of K&A-SRP (Ferrell & McCaffery, 2008). The tool is standardized and has been used by previous studies. Hence, its content validity is already established across culture and nationalities which was based on the guidelines of pain management of the American Pain Society, the World Health Organization, and the Agency for Health Care Policy and Research (Ferrell & McCaffery, 2008). The instrument has 40 item questions broken down into 22 multiple choice, 14 true or false, and four clinical questions. A higher score indicates better knowledge/more positive attitude. The instrument has a Cronbach alpha of 0.70 and the test-retest reliability as > 0.80 .

Data Analysis

To analyse the profile variables, post-operative patients' satisfaction, and nurses' knowledge and attitude towards pain management the descriptive and inferential data were computed using the SPSS version 25. The data gathered from cross-sectional survey where data sourced from the post-operative patients and nurses which were tabulated and properly subjected to statistical computation and analysis using descriptive and inferential statistical tools such as mean, weighted mean and standard deviation (Omair, 2015). Frequency and percentages were also used to describe the personal profile variables of the respondents.

To analyse post-operative patients' satisfaction the following descriptive statistics such as mean and standard deviation were used with the adopted interpretations and scale ranges: Strongly Agree/ Very High (4.20-5.00); Agree/ High (3.40-4.19); Undecided/ Moderate (2.60-3.39); Disagree/ Low (1.80-2.59); strongly Disagree/ Very Low (1.00-1.79). Consequently, the mean percentage scores of the nurses on their knowledge and attitude towards pain management was interpreted using mean and standard deviation with the following: Very Low (less than 60%); Low (60.00-69.00 %); Moderate (70.00-79.99%); High (80.00-89.99%); Very High (More than 90.00%).

To ascertain the differences on post-operative patients' satisfaction, and nurses' knowledge and attitude towards pain management, mean test of differences such as independent sample t-test, ANOVA, Post Hoc-tukey HSD test were used (Adbi and Williams, 2010). Considering that this study looked into the relationship of transformative leadership to the factors of organisational climate and employee innovative behaviour, person r was used to test the relationship. The correlation between variables varied between -1 and +1 where zero implies no relationship and 1 means a perfect correlation. The sign of the r denotes the direction of the relationship. A negative computed r means an inverse relationship. Hence, the strength of the relationship increases both from 0 to +1, and 0 to -1 (Dancey and Reidy, 2007).

RESULTS AND DISCUSSION

Level of Post-Operative Pain Management Satisfaction of Patients

There were 78 samples of post-operative patients who met the inclusion criteria set in this study. Table 3 shows the pain management program satisfaction as assessed by the post-operative patients. The respondents generally assessed the program at a moderate level of satisfaction as evidenced with the mean of 3.24 (sd=0.862) denoting a moderate level of outcomes on the implementation of post-operative pain management program among the participating medical institutions in China. Looking at

the context of the study, it is significant to note that all the components of the pain management program namely pain relief experience, care provided by the nurses, education provided as to pain management, and therapeutic dialogue provided by the nurses to patients were all assessed by postoperative Chinese patients moderate satisfaction or at a fair level. It implies that much has to be done the pain management program of the participating medical institutions particularly on its systematic implementation and proper management in order to achieve its positive outcomes in delivering health services as well as reducing the pain to the people.

Table3. Satisfaction of Post-Operative Patients on Pain Management Program

Patient Satisfaction as to the outcomes of Pain Management Programme	Mean (n=76)	SD	Interpretation
1. Pain relief experience	3.30	0.965	Moderate Level
2. Care provided by the nurses	3.13	1.309	Moderate Level
3. Education provided as to pain management	3.26	1.257	Moderate Level
4. Therapeutic Dialogue provided by Nurses	3.25	1.376	Moderate Level
Over-all Satisfaction	3.24	0.862	Moderate Level

Legend: Strongly Agree/ Very High^a (4.20-5.00); Agree/ High^b (3.40-4.19); Undecided/ Moderate^c (2.60-3.39); Disagree/ Low^d (1.80-2.59); strongly Disagree/ Very Low^e (1.00-1.79)

Among the service components of the pain management program is on providing *pain relief experience* to Chinese post-operative patients reported a satisfactory assessment. This suggests that respondents have moderate level of satisfaction on the provision of pain relief experience. The reasons are attributed to the immediate protocols performed by nurses to gradually manage the pain experiences of post-operative patients among which is the systematic monitoring and employing intervention techniques about pain relief basics. Despite the moderate level of satisfaction, there is a need to strengthen the standards of pain management programs among Chinese medical institutions. Pain alleviation is an important component of pain management program. Effective postoperative pain management enhances comfort of patients, increases their level of satisfaction, helps a lot in more improve physiotherapy as well as earlier rehabilitation having improved postoperative outcome (Fearon et al. 2005; Kehlet and Holte, 2001; Kehlet, 2018; Kim et al, 2017; van Boekel, 2017).

Relative to the *care provided by nurses*, the Chinese patients established a moderate level of satisfaction on the caring service provided by the nurses. This can be attributed to how the nurses managed to assist the patients in professional way. Clinical nurses are the forerunners of caring value towards hospitalized in-pain patients. The finding implies that nurses take share in the opportunity to improve the health delivery system which can provide relief to these patients in pain (WHO, 2008; Fang et al, 2017; Francis & Fitzpatrick). As to the *education provided to pain management*, the post-operative Chinese respondents have manifested a moderate level of satisfaction on the provision of education to the patients regarding the self-management of the pain they experienced. It is indicative that the nurses are moderately capable of providing information and knowledge to the post-operative patients. Hence, enhancement can be done since the finding can be attributed that nurses cannot properly enhance patients' knowledge if they themselves do not have the appropriate knowledge towards pain management. Shen et al (2008) reported that in mainland China, that pain management care is not a required course in the nursing degree program and the tendency is that nurses may not master the competency and skills in pain management before employment. As seconded by Keefe and Wharrad (2012) that pain management is not prioritized as well as under-utilized among nursing degree program. Lastly, the *therapeutic dialogue* provided by the nurses has been assessed moderately satisfied by the post-operative patients. The finding means that a nurse is moderately capable of manifesting health counselling dialogue to the postoperative patients. This nursing competency is embedded in the course psychiatric nursing where nurses are oriented on their roles on managing and preventing patients' aggressive behaviour particularly when they are in pain. Rosenberg and Gallo-Silver (2011) confirmed that engaging in therapeutic dialogue can help address patients distressed as well as depersonalizing negative messages from them. This will eventually formulate a goal-driven healing relationship.

In general, patients' satisfaction towards pain management is an indicator of effective and efficient health service delivery program. In such a way, it will achieve the goal for universal health care system. Studies measuring patients' outcomes and satisfaction to pain management program concurred that it is a fundamental feedback mechanism to measure the effectiveness of pain management implement by medical institutions (Beck et al, 2010; Bozimowski, 2012; Caruso et al, 2018; Hanna et al, 2012; Matthias et al, 2010; Philipps et al, 2013; Scher et al, 2018; You et al, 2013). The finding of this component of this study adds to policy recommendations among health institutions in China in particular concerning the effective implementation of pain management program to clienteles lie in the updated professional training, effective therapeutic communication, and providing other functional alternatives for patients such as improving the efficiency pain management program, dealing with technological advances will increase patients' satisfaction and enhance performance. Hence, further studies may be conducted in this context to validate what this present paper has to offer.

Difference on the Satisfaction of Pain-Operative Patients When grouped According to their Profile Variables

Results of the test of differences on the post-operative patients when grouped according to selected variable is shown in Table 4. Results showed that patients' gender and education spelled differences on level of satisfaction while civil status do not spell significant difference to the level of patients' satisfaction towards pain management. This implies that when taken as a whole, gender and education of post-operative patients can be considered as factors in the planning and implementation of pain management program among health institutions in China.

Table 4. Difference on the Satisfaction of Pain-Operative Patients

Patient Satisfaction as to the outcomes of Pain Management Programme	Gender	Civil Status	Education
Pain relief experience	0.777 ns	0.730 ns	0.401 ns
Care provided by the nurses	0.512 ns	0.852 ns	0.728 ns
Education provided as to pain management	0.652 ns	0.152 ns	0.731 ns
Therapeutic Dialogue provided by Nurses	0.045 *	0.901 ns	0.043 *

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.00$

ns = not significant

Relative to the therapeutic dialogue provided by nurses, the significant differences are seen in gender and education. Chinese female post-operative patients assessed themselves to have higher satisfaction level compared to male patients implying that female tend to prefer therapeutic conversations from nurses. The finding can be attributed to the nature of women who are more conversant and emotional than males (Back & Debus, 2019; Hall, Carter & Horgan, 2000; Kimbrough et al, 2013). Likewise, the finding can be explained that women have lower pain tolerance and threshold compared to males (Becker and McGregor, 2017; Sorge and Totsch, 2017) hence they tend to prefer therapeutic dialogues. Consequently, those post-operative patients who have college education tend to prefer to therapeutic dialogue compared to those from primary, middle and high school respondents. This finding can be attributed that those Chinese post-operative patients have higher level of education tend to ask questions on how to overcome their post-operative pain experiences as well as the self-management treatment they can do to pursue healing. Their level of education make them more confident to articulate and express their pain tolerance to the health providers. Caruso et al (2018) highlighted that patient satisfaction increases when therapeutic conversation is encouraged. Shen et al (2008) also confirmed that for Chinese populations, experiencing pain after surgical operations is a normal reaction of the body. The significance of this finding can be an important input for health institutions in China in designing standards and procedures for effective and adequate pain management program.

Level of Knowledge and Attitudes Nurses on Pain Management

This study also shed light on the prevailing attitudes and skills of nurses being the frontline of health services providers on pain management program. As seen in Table 4, it presents the level of knowledge and attitude of the nurses. A mean percentage score of 72.88 (sd=10.338) revealing a moderate level of knowledge and attitude of the respondents towards pain management is presented. The present finding of the study using the K&A-SRP instrument indicates that Chinese participants still manifest inadequacy of knowledge and attitude towards pain management. It is worth noticing that when taken individually in the table presented (please see table 4), the items in which the nurses perform *high* are in the following eight items (1, 23, 30, 31, 33, 36, 38, and 40). Meanwhile, they got moderate scores in 20 items (7,10, 14,15,16,18,19, 20,22,24,25, 26,27, 28,29, 32, 34, 35, 37, and 39). It is alarming to note that the Chinese nurse have low scores in the items (2, 5, 8, 9, 12, 13, and 21) and very low scores in the items (3, 4, 6, and 11). Focusing on the identified items where the nurses scored low and very low are related to how they manage and handle severe pains among post-operative patients. This is indicative of their misconceptions and insufficient knowledge about pain management and their role confusion as healthcare professionals.

This finding of this study on the knowledge and attitudes of Chinese nurses towards pain management presents consistency with a decade previous studies across different countries describing a deficit knowledge and negative attitude of nurses towards pain management (Al Qadire & Al Khalailah, 2014; Al-Khawaldeh, Al-Hussami, & Darawad, 2013; Alotaibi et al, 2018; Al-SHaer, Hill and Anderson, 2011; Arav et al, 2016; Bernardi et al, 2007; Blodal and Halldorsdottir, 2009; Brant et al, 2017; Furjanic et al, 2016; Gretarsdottir et al, 2017; Liu, So, & Fong, 2008; Lunsford, 2015; Nimbalkar et al, 2014; Tse and Ho, 2014; Tse et al, 2012; Utne, Småstuen, & Nyblin, 2019; Wilson, 2007). Hence, the call for significant curricular reform in the undergraduate nursing, and adequate and continuous professional development for nurses to address pain management concerns are being recommended. In the context of this study, the low competency of the Chinese nurses to deal with pain management for post-operative patients is implicated to the nurses' inadequacy of educational preparation. The knowledge gap between the theory and practice in pain management among the Chinese nurses needs to be addressed properly to assure quality health services. If this problem permeates, nurses may not be able to properly integrate pain assessment and management intervention to their professional practice

Table 5. Knowledge and Attitude towards Post-operative Pain

Item Content		Percentage of Correct Answers (n=97)		Descriptive Interpretation
True or False Questions				
1.	Vital signs are the most reliable indicators of the patient's intensity pain.	n=86	88.66	High
2.	Since nervous system is underdeveloped among children under two years of age, they have decreased pain sensitivity and limited memory of painful experiences.	n=66	68.04	Low
3.	Patients who can be distracted from pain usually do not have severe pain.	n=56	57.73	Very Low
4.	Patients may sleep in spite of severe pain.	n=49	50.52	Very Low
5.	Aspirin and other non-steroidal anti-inflammatory agents are NOT effective analgesics for painful bone metastases.	n=61	62.89	Low
6.	Respiratory depression rarely occurs in patients who have been receiving stable doses of opioids over a period of months.	n=55	56.70	Very Low
7.	Combining analgesics that work by different mechanisms (e.g., combining an NSAID with an opioid) may result in better pain control with fewer side effects than using a single analgesic agent.	n=71	73.20	Moderate
8.	The usual duration of analgesia of 1-2 mg morphine IV is 4-5 hours.	n=66	68.04	Low
9.	Research shows that promethazine (Phenergan) and hydroxyzine (Vistaril) are reliable potentiators of opioid analgesics.	n=79	60.82	Low
10.	Opioids should not be used in patients with a history of substance abuse.	n=72	74.23	Moderate
11.	Morphine has a dose ceiling (i.e., a dose above which no greater pain relief can be obtained).	n=35	36.08	Very Low
12.	Elderly patients cannot tolerate opioids for pain relief	n=62	63.92	Low
13.	Patients should be encouraged to endure as much pain as possible before using an opioid.	n=64	65.98	Low
14.	Children less than 11 years old cannot reliably report pain so clinicians should rely solely on the parent's assessment of the child's pain intensity.	n=69	71.88	Moderate
15.	Patients' spiritual beliefs may lead them to think pain and suffering are necessary.	n=74	76.29	Moderate
16.	After an initial dose of opioid analgesic is given, subsequent doses should be adjusted in accordance with the individual patient's response.	n=77	79.38	Moderate
17.	Giving patients sterile water by injection (placebo) is a useful test to determine if the pain is real	n=83	85.57	High
18.	Vicodin (hydrocodone 5 mg þ acetaminophen 500 mg) PO is approximately equal to 5-10 mg of morphine PO.	n=70	72.16	Moderate
19.	If the source of the patient's pain is unknown, opioids should not be used during the pain evaluation period, as this could mask the ability to correctly diagnose the cause of pain.	n=69	71.13	Moderate
20.	Anticonvulsant drugs such as gabapentin (Neurontin) produce optimal pain relief after a single dose.	n=77	79.38	Moderate
21.	Benzodiazepines are not effective pain relievers unless the pain is due to muscle spasm.	n=66	68.04	Low
22.	Narcotic/opioid addiction is defined as a chronic neurobiological disease, characterized by behaviors that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, and craving.	N=71	73.20	Moderate
Multiple-Choice Questions				
23.	The recommended route of administration of opioid analgesics for patients with persistent cancer-related pain is a. intravenous, b. intramuscular, c. subcutaneous, d. oral, e. rectal	n=79	81.44	High
24.	The recommended route of administration of opioid analgesics for patients with brief, severe pain of sudden onset, such as trauma or postoperative pain is a. intravenous, b. intramuscular, c. subcutaneous, d. oral, e. rectal	n=74	76.29	Moderate
25.	Which of the following analgesic medications is considered the drug of choice for the treatment of prolonged moderate to severe pain for cancer patients? a. codeine, b. morphine, c. meperidine, d. tramadol	n=77	79.38	Moderate

26.	Which of the following IV doses of morphine administered over a 4 hour period would be equivalent to 30 mg of oral morphine given q 4 hours: a. Morphine 5 mg IV, b. Morphine 10 mg IV, c. Morphine 30 mg, IV d. Morphine 60 mg IV	n=71	73.20	Moderate
27.	Analgesics for post-operative pain should initially be given a. around the clock on a fixed schedule, b. only when the patient asks for the medication, c. only when the nurse determines that the patient has moderate or greater discomfort	n=72	74.23	Moderate
28.	A patient with persistent cancer pain has been receiving daily opioid analgesics for 2 months. Yesterday the patient was receiving morphine 200 mg/hour intravenously. Today he has been receiving 250 mg/hour intravenously. The likelihood of the patient developing clinically significant respiratory depression in the absence of new comorbidity is: a. less than 1%, b. 1%-10%, c. 11%-20%, d. 21%-40% e. >41%	n=77	79.38	Moderate
29.	The most likely reason a patient with pain would request increased doses of pain medication is a. The patient is experiencing increased pain, b. The patient is experiencing increased anxiety or depression, c. The patient is requesting more staff attention, d. The patient's requests are related to addiction	n=74	76.29	Moderate
30.	Which of the following is useful for treatment of cancer pain? a. Ibuprofen (Motrin), b. Hydromorphone (Dilaudid), c. Gabapentin (Neurontin), d. all of the above.	n=78	80.41	High
31.	The most accurate judge of the intensity of the patient's pain is a. the treating physician, b. the patient's primary nurse, c. the patient, d. the pharmacist, e. the patient's spouse or family	n=80	82.47	High
32.	Which of the following describes the best approach for cultural considerations in caring for patients in pain: a. there are no longer cultural influences in the U.S. due to the diversity of population, b. cultural influences can be determined by an individual's ethnicity (e.g., Asians are stoic, Italians are expressive, etc), c. patients should be individually assessed to determine cultural influences, d. Cultural influences can be determined by an individual's socioeconomic status (e.g., blue collar workers report more pain than white collar workers).	n=68	70.10	Moderate
33.	How likely is it that patients who develop pain already have an alcohol and/or drug abuse problem? a. < 1%, b. 5%-15%, c. 25%-50%, d. 75%-100%	n=81	83.51	High
34.	The time to peak effect for morphine given IV is a. 15 min, b. 45 min, c. 1 hour, d. 2 hours	n=76	78.35	Moderate
35.	The time to peak effect for morphine given orally is a. 5 min, b. 30 min, c. 1-2 hours, d. 3 hours	n=71	73.20	Moderate
36.	Following abrupt discontinuation of an opioid, physical dependence is manifested by the following: a. sweating, yawning, diarrhea and agitation with patients when the opioid is abruptly discontinued, b. Impaired control over drug use, compulsive use, and craving, c. the need for higher doses to achieve the same effect, d. a and b	n=79	81.44	High
Clinical Scenario				
37.	The final four questions are clinical vignettes. Two patients are presented. For each patient, you are asked to make decisions about pain and medication. Patient A: Andrew is 25 years old and this is his first day following abdominal surgery. As you enter his room, he smiles at you and continues talking and joking with his visitor. Your assessment reveals the following information: BP 1/2 120/80; HR 1/4 80; R 1/4 18; on a scale of 0 to 10 (0 1/4 no pain/discomfort, 10 1/4 worst pain/discomfort) he rate his pain as 8. 37 A. On the patient's record you must mark his pain on the scale below. Circle the number that represents your assessment of Andrew's pain (A VAS from 0 to 10 presented)	n=72	74.23	Moderate
38.	B. Your assessment, above, is made two hours after he received morphine 2 mg IV. Half hourly pain ratings following the injection ranged from 6 to 8 and he had no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2/10 as an acceptable level of pain relief. His physician's order for analgesia is "morphine IV 1-3 mg q1h PRN pain relief." Check the action you will take at this time: 1. administer no morphine at this time, 2. administer morphine 1 mg IV now, 3. administer morphine 2 mg IV now, 4. administer morphine 3 mg IV now. 48.9 Patient B: Robert is 25 years old and this is his first day following abdominal surgery. As you enter his room, he is lying quietly in bed and grimaces as he turns in bed. Your assessment reveals the following information: BP 1/2 120/80; HR 1/4 80; R 1/4 18; on a scale of 0 to 10 (0 1/4 no pain/discomfort, 10 1/4 worst pain/discomfort) he rates his pain as 8.	n=84	86.60	High
39.	A. On the patient's record you must mark his pain on the scale below. Circle the number that represents your assessment of Robert's pain. (A VAS from 0 to 10 presented)	n=76	78.35	Moderate
40.	B. Your assessment, above, is made two hours after he received morphine 2 mg IV. Half hourly pain ratings following the injection ranged from 6 to 8 and he had no	n=80	82.47	High

clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2/10 as an acceptable level of pain relief. His physician's order for analgesia is "morphine IV 1-3 mg q1h PRN pain relief." Check the action you will take at this time: 1. administer no morphine at this time, 2. administer morphine 1 mg IV now, 3. administer morphine 2 mg IV now, 4. administer morphine 3 mg IV now.		
Mean Percentage Score as Revealed by K&A-SRP (Ferrell & McCaffery, 2008)	72.88 (sd=10.339)	Moderate Level

Legend: Very Low (less than 60%); Low (60.00-69.00 %); Moderate (70.00-79.99%); High (80.00-89.99%); Very High (more than 90.00%)

The discrepancy found on the knowledge and attitude of nurses on pain management in this study hopes to offer interventions among health institutions China. China being one of the largest counties of the world with huge population needs to properly deal with this concern to attain quality healthcare services. Since relaying only with the presently existing nursing education program will not improve knowledge and attitude of nurses towards pain management but it calls for a collaborative and cooperative involvement of the government, health practitioners, and the academe to carry out initiatives in improving the competencies of nurses as 21st century health practitioners.

Difference on the Knowledge and Attitudes of Nurses When Grouped According to their Profile Variables

Moreover, test of difference on the percentage scores and attitudes of the nurse's towards pain management program when grouped according to their profile variables was considered in this study. Table 6 presents the results that age, experience, attendance to seminar, advance degree, and frequency of caring spelt differences on the knowledge and attitudes of nurses towards pain management. This indicates that these personal profile variables of the nurses are major factors to be considered in enhancing their knowledge and attitudes when taken as a whole.

Table 6. Difference on the Knowledge and Attitude of Nurses Towards Pain management

Profile Variables	Knowledge and Attitude Towards Pain Management
Sex	0.150 ns
Age	0.023 *
Experience	0.000**
Attendance to Seminar	0.000**
Advance Degree	0.032*
Frequency of Caring	0.019*

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$
ns= not significant

The significant difference on age showed that those nurses who are in the brackets of 21-30 and 31-40 years old have higher percentage mean scores in their knowledge and attitude towards pain management compared to those who are in the age brackets of 41-50 and 51-60 years old. It can be practically explained that younger groups have higher scores compared to those in the older groups. Meanwhile, those nurses who have 6-10 years of work experiences score significantly higher in their knowledge and attitude, implying that experience is a factor of knowledge and attitude acquisition. In like manner, those nurses who attended seminar on pain management, have advanced degree in nursing, and who are always involved in dealing with Chinese post-operative patients have scored significantly higher compared those counterparts. The findings in this portion of the study are attributable to age, experience, education as factor on the knowledge and attitude on pain management among nurses which are consistently concur with previous studies (Abdallah et al, 2011; Alkatib, Al Qadine and Alshraideh, 2019; Alnajar et al, 2019; Francis and Fitzpatrick, 2013; Li et al, 2019; McNamara et al, 2012; Meissner et al, 2015; Pretorius et al, 2015; Tapp and Kropp, 2005; Yildirim, Cicek & Uyar, 2008). Having identified the different profile variables spelt differences on the knowledge and attitude of nurses towards pain management. This study presents implications on the role of continuing professional education program, personal experiences, maturity and empathic attitude are important factors to be considered in enhancing Chinese nurses' knowledge and attitude towards pain management. This study will help to present factors on what to consider in enhancing nurses' competency and skills.

Relationship between Post-Operative Patients Satisfaction and Nurses' Knowledge and Attitude towards Pain management

This study hypothesized that in the Chinese context, post-operative patients' satisfaction is associated to the nurses' knowledge and attitude towards pain management. The association of the two majors may weaken or strengthen claims presented in the literature. Table 7 shows that there is a significant relationship between patient satisfaction and knowledge and attitudes of nursing staff towards pain management ($p = 0.025$). The computed (r value= 0.455) showed a moderate relationship between the two variables signifying that a positive moderate relationship exists between the two variables. It can be practically interpreted that the positive relationship would mean that the higher nurse's level of knowledge and attitude towards pain management tend

to positively increase the satisfaction of post-operative patients. This explains that when patients are served by competent nurses their satisfaction tend to increase.

Table 7. Relationship Patients' Satisfaction and Nurses' Knowledge and Attitude towards Pain Management

Variables	Nurses' Knowledge and Attitude Towards Pain Management
Post-Operative Patients Satisfaction level	r value = 0.455 p value = 0.025 *

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.00$
ns = not significant

The finding harmonizes with the latest literature showing that pain management as patients' satisfaction are positively correlated (Chaw et al 2019; Daniels et al, 2019; Duncan et al, 2019; Lee et al, 2019; Scher et al, 2018; Siu et al, 2019; Thinh et al, 2018). Pain as a prevalent health challenges among Chinese requires appropriate pain management is an important indicator of patients' satisfaction in the 21st century healthcare service. The finding of this present study implicates the need for quality health services offered by healthcare frontlines especially then nurses to be equipped with the necessary competencies in dealing with post-operative patients in China.

Conclusion

This study is a cross-sectional survey of the satisfaction of post-operative patients its relationship to the knowledge and attitudes of Chinese nurses on pain management. Findings of the study showed that a moderate level of outcomes on the implementation of post-operative pain management program among the participating medical institutions in China. It is significant to note that all the components of the pain management program namely pain relief experience, care provided by the nurses, education provided as to pain management, and therapeutic dialogue provided by the nurses to patients were all assessed by postoperative Chinese patient's moderate satisfaction or at a fair level. Meanwhile, gender and education of post-operative patients can be considered as factors in the planning and implementation of pain management program. Consequently, similar to studies conducted worldwide, Chinese nurses do not establish yet an optimal level of knowledge and attitude towards pain management showing moderate level of mean percentage scores. Meanwhile age, experience, education are factors on the knowledge and attitude on pain management among nurses. Finally, positive moderate relationship is established between patient satisfaction and knowledge and attitudes of nursing staff towards pain management. The findings of these study call for action and reform in the implementation of pain management program focusing on the major role of competent nurse.

Practical Implication of the Study

The future of pain management delivery system lies in the competency of nurses as healthcare professionals. There is a need to empower nurses to provide the best and quality health care services in the world. With regards to the practical implications of the study, there is a need for serious reform on the pain management program of health institutions in China focusing on the knowledge and attitudes of nurses towards post-operative pain management. This study offers practical suggestions as follows: First, there is a need to intensify the professional development of Chinese nurses focusing on the pain management knowledge and attitudes by doing the following components: (a) training module development related to the least mastered skills on pain management of the nurses identified in this study; (b) integrate pain management course in the nursing degree program as experiential learning course of the nursing students to match theory and practice as a component of the pre-service degree program; (c) to guarantee quality patient care and satisfaction, there is a need for in-service nurses to be contently monitored on their post-operative pain management tasks by mentoring and collaboration with more experience nurses. Secondly, there is a need for the standardization of policies among health institutions in China with regards to pain management and patients' education. Thirdly, allocation of funds for the professional development and training facilities of nurses on post-operative pain management is needed. Fourth, further studies need to be conducted as a sort of validating the findings of the present study.

Strengths and Limitations of the Study

This paper adds to the existing body of literature using cross-sectional survey of patients and nurses on the implementation of pain management program and nurses' attitude and knowledge considering the personal profile variables of the respondents which strengthens the decade result of literature on the nurses' deplorable knowledge and attitude towards pain management. Despite the use of cross-sectional method, it is still encouraged for future studies should be conducted with larger number of samples using mixed method of research to obtain triangulation and validation of results. Likewise, there is also a needed for multilevel analyses to ascertain the real outcome of post post-operative pain management program and the satisfaction of the patients. Moreover, the study is only limited to selected number of participating hospitals due to the interest of time and funding.

APPENDICES

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