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Integrate Review Postoperative Pain Assessment in Surgical Adult Patients

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Abstract

This integrative review aimed to systematically searching update evidences in postoperative pain assessment regarding surgical adult patient and the existing tools as well as its the psychometric properties of the existing tools for postoperative pain assessment among adult patients. The method of this review was conducted by integrating review. The database search through PubMed and CINAHL, and additional searching was undertaken in The Journal of Pain Management. The search was limited with English studies from 2014 to Jan. 2019. The included studies contain one guideline, two systematic review studies, one mix methods research, and six descriptive studies with sample size range from 21 to 144. Among of these studies mentioned eight types of pain assessment tools including numerical pain scale (NRS), CAPA, Wong-Baker Faces pain scale, color circled pain scale, 11-faces pain scales, visual analog scale (VAS) and verbal rating scale (VRS). And four studies test the psychometric properties of pain assessment tools. Consequently, numerical pain scale is widely used to detect pain intensity after surgery. However, based on the updated evidence, postoperative pain assessment should beyond pain intensity, onset and duration of pain, pain location, and duration, quality of pain, aggravating and relieving factors, previous treatment and pain effect, as well as barriers to pain assessment should be measured.

Keywords

Pain, pain assessment, pain assessment tool

1. Background and Significance of the Problem

Pain is common symptom after surgery. There is gold standard guideline for postoperative pain management. Recently studies found that 75% patients experienced acute pain after surgery [1]. Inadequate pain control will lead to delay recovery, and develop complication related to pain such as infective breathing, sleep disturbance, delayed healing as well as developed to chronic pain [2].

In fact, insufficient assessment of pain remains the major factor of undertreatment pain [3, 4]. As pain assessment is the first step of pain management. Accordingly, pain assessment helps to measure whether pain management is adequate, whether intervention is met and treatment plan is adjusted [1]. Therefore, the consequences of inaccurate postoperative assessment are serious. It may relate insufficient pain management as well as uncontrolled pain. As postoper-

ative pan its subjective nature, patients' self-report is the key indicator of pain. Patients' behavior, attitude and knowledge may have an impact on the assessment.

Previous studies have showed that patient lacks of knowledge of pain and delays report pain being risk factors to receive appropriate treatment in time.And effectiveness of an educational intervention on relieving pain has being proved is may benefit to postoperative patient [1]. In addition, foreign countries around 40 years identified that nurses as well as surgical nurses play a key role in pain relief and take main responsibility for adequate pain management regarding postoperative patients. Also, the core competencies for pain management consist of multidimensional inherent pain, pain assessment, management of pain, and context influence pain management **[5].** However, less than half of patients who experienced surgery were unsatisfied with pain management, one of the reasons due to nurse underestimate patient pain [1, 6].

Postoperative pain management [1] recommend nurses should provide tailored education to patient and family before surgery to conduct adequate pain assessment after surgery. Also, postoperative pain should be assessed in multidimensional approach, and validated tool should be used to trigger the response of pain treatment and adjust its plan. Pain should be rating at rest and with activities (eg. cough, turning position). Accordingly, frequency of assessment and reassessment should to determine intervention effectiveness and how the pain impact function.

In China, the standard tool for assess pain among postoperative adult patient is not available. The surgical nurses assess postoperative pain when patient report severity pain. 81% postoperative adult patients experience moderate to severe pain [7]. They would receive analgesic when they asked the physician during visiting time [8].

In order to improve postoperative pain management in China, the effective postoperative pain assessment is required. Therefore, this study was to review update issues about postoperative pain assessment, analyze the existing tools for postoperative pain assessment among adult patients and synthesis the psychometric properties of the tools. Moreover, the clinical applicable of the postoperative pain assessment tools would be concluded for suggestion.

2. Objective

1) Review the update evidences related to postoperative pain assessment among adult patients.
2) Analyze the existing tools for postoperative pain assessment among adult patients.
3) Synthesis the psychometric properties of the existing tools for postoperative pain assessment among adult patients.

3. Method to Conduct Integrate Review

The databases PubMed and CINAHL were used to identify studies on postoperative pain assessment on adult patient according to inclusion criteria: 1) Published within 5 years 2014- 2019; 2) Written in English; and 3) full text with focusing on postoperative pain assessment.

The keywords conducting searching were "P = postoperative adult patient OR surgical adult patient after surgery AND I = Postoperative pain assessment AND O = validity and reliable of pain assessment tool OR pain measurement". In addition, except the two databases, conducting search in *the journal of Pain Management in Nursing*. Any studies which not focus on postoperative pain assessment were excluded.

In total, 47 articles were identified in the two database and one journal. 11 studies in PubMed and 1 study in CINAHL, 33 studies in *the journal of Pain Management in Nursing*. After screened with inclusion criteria, 9 studies were eligible to access. While 4 studies were excluded due to not focus on pain assessment but pain treatment. And 5 studies were found from reference. Finally, 10 studies were included (Figure 1).

4. Critique and Evaluation

Critical appraisal of literature in term of quality and level of evidence.

Critical appraisal of ten studies was conducted in terms of level of evidence by using JBI (2014). Methodological quality assessments were conducted by using JBI critical appraisal tools (2017).

5. Data analysis

Review for contents and data extraction and synthesis. The analysis of the reviewed studies focused on update evidence-based pain assessment, existing tool and its psychometrics regarding postoperative adult surgical patient.

6. Result

The result of pain assessment of the included ten studies will be describe in following table, geographical distribution and methodological quality of included review studies. In this review, the included ten studies were conducted in

American, China, Africa, Thailand, and Turkey. The included studies contain one guideline, two systematic review studies, one mix methods research, and six descriptive studies with sample size range from 21 to 144. Among of these studies mentioned eight types of pain assessment tools including numerical pain scale (NRS), CAPA, Wong-Baker Faces pain scale, colour circled pain scale, 11-faces pain scales, visual analog scale (VAS) and verbal rating scale (VRS). All of these scales were validated as researcher stated. And numerical pain scale is widely used to detect pain intensity after surgery. While, Sayin & Akyolcu [9] reported patient most prefer faces pain scale (FPS) and NRS due to they are short and simple to understand and assess pain.

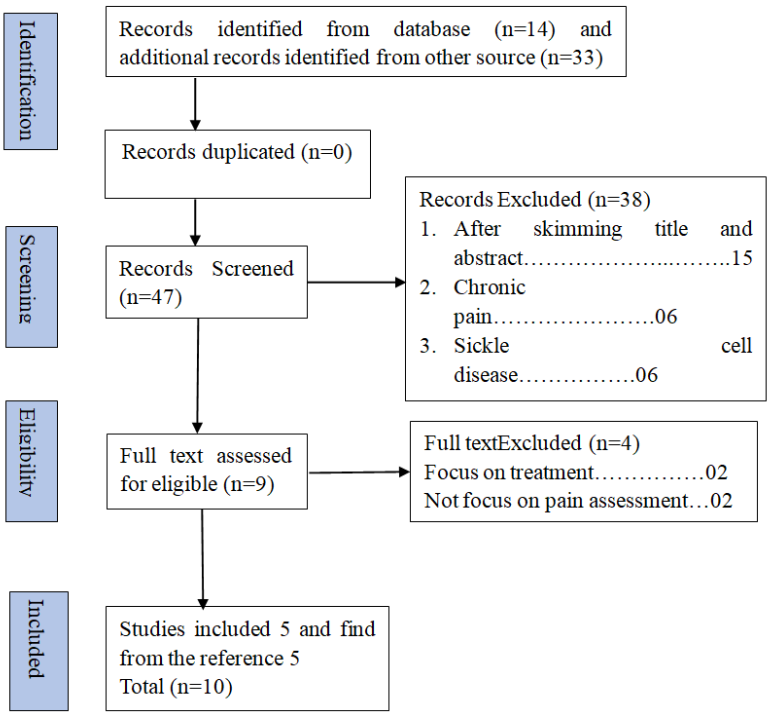

Figure 1. PRISMA of Literature Searching Result.

Update evidence related to postoperative pain assessment should conduct in comprehensive multidimensional approach. As it recommended postoperative pain assessment should assess multidimensional aspect of pain, including onset and pattern of pain, location of pain, quality of pain, intensity of pain, pain aggravating and relieving factors, previous treatment and pain effect, as well as assess barriers to pain assessment [1]. According to researchers' suggestions postoperative pain assessment should be in a comprehensive approach to assess. To conduct a comprehensive postoperative pain assessment, preoperative tailored education is necessary to patient and family, and it should include the plan of pain treatment after surgery and goals for postoperative pain management. In additional, patient and family should be invited to join in decision making process terms of education and treatment plan. Also, validated pain assessment tool is required to provide vital clue to postoperative pain care, from reviewed articles the eight types of tools were validated can be used to clinical practice. Pain assessment tool selection should base on the patient developmental status, cognitive status, level of consciousness, educational level, and cultural and language, as well as considering patient preference. Then, pain assessment experience should be recorded in standard documentation to provide reference to improve pain management and make treatment plan. Time to assess and reassess postoperative pain should base on patient condition change.

Karcioglu et al. [10] reported patient preference numerical pain scale compared with visual analog scale and verbal rating scale, in which NRS is more sensitivity and easier to assess postoperative pain intensity. CAPA as a multifaced scale to assess patient pain experience after implementation the tool patient satisfaction was high improve [11]. And compared with NRS, CAPA is more comprehensive to assess pain. Beyond pain intensity CAPA provides a structured tool for standard communication of pain information including change in pain over time, efficacy of interventions, and pain's effect on functional status and sleep. And it can be generalized to assess acute pain. Colour circled pain scale was preference by Ghana, it may impact by the different color means different meaning in Ghana. 11-faces pain scales sen-

sitively detected changes in pain intensity over time and in response to pain medications in orthopedic patients. Therefore, it is suitable for use in the assessment of orthopedic patient with acute pain.

7. Discussion

In China, orthopedic nurses focus on assessing pain intensity and location, regardless of pain quality, duration and the effect on functional exercise evaluation. And only half of nurse education inpatient about the correct concept of pain treatment in level 2 hospital. It against of guideline recommendation. Nevertheless, patient with experienced severe reported higher pain interference and more side effect of pain treatment but also report higher satisfaction regarding service, which reflects negative attitude towards pain management in Chinese clinicians and patients. Therefore, it is important that assess patient perception and misconception of pain, and receive individual education. At the same time hospital should establish standard principle of pain assessment and regulation to mandatory for nurses. On another side, continuing educational program is necessary to improve poor pain assessment situation.

Measurement of the pain assessment should be standardized, and the standard focused on five distinct types of evidence [12]: 1) test content; 2) response process; 3) internal structure; 4) relation with other variables, and 5) the consequence of testing. In the included studies, Chinese revised APS-POQ-R [13], colour circled pain scale, numerical pain scale and Wong-Face pain scale [14], 11-Face pain scale [15] already test the validity and the result shows these scales were acceptable can. Although in the research of CAPA didn't test, the implementation result shows it has well validity for clinical management for provide standard communication for assess pain change over time, effectiveness of pain treatment and pain impact on function. It illustrates multidimension aspect of pain. Also, it easy and quick to detect pain, patient easy understanding. But it needs nurse to well understand patient pain experience and require good communication skill to conduct.

8. The Psychometric Properties of the Existing Measurements

Chinese Version of the Revised American Pain Society Patient Outcome

Questionnaire in Postoperative Patients [13] it contains three dimensions of pain including physical, sensory and affective of pain. Overall internal consistency reliability of 0.73 and ICV of 0.83 to 1.0, and it has high level of patient satisfaction. according to Polit & Beck [16], consistency reliability with acceptability criteria of >= 0.7. Therefore, this questionnaire is reliable and validated, and fit to surgical setting to use to assess postoperative pain.

Clinically Aligned Pain Assessment [11] was developed by University of Utah Health Care in 2012. This tool consists of sensory, cognitive and affective aspects of pain. And it already to be accepted by The Joint Commission and The Minnesota Department of Health as it meets regular requirement for pain assessment. Different from other tools, this tool conducted with 5 questions to assess pain but no standard questions and scoring. Although it is easy to use in clinical, nurse needs to deeply understand of patient pain experience and also about treatment effectiveness. But the reliability and validity didn't test.

Numeric Rating Scale, Wong-Baker Faces Pain Scale and Colour Circle Pain Scale [14] are to test pain intensity and severity. Pearson's correlation coefficient of the three scale ranges from 0.70 to 0.75 ($p<0.001$), inter-rater reliability NRS of 0.92, Wong-Baker Faces Pain Scale of 0.93, Colour Circle Pain Scale of 0.93. Sensitivity of the three scales to analgesia pretest and posttest reveal significant different ($p<0.001$). Patient pain score decrease after receive analgesia.

The 11-Face Faces Pain Scale [15] assess patient pain severity through observation patient face, Spearman's correlation coefficient of the 11-Face Face Pain Scale correlation with between 11-Face Face Pain Scale and NRS, so when using need nurse empathy to patient and carefully observe patient facial change, if the nurse not sensitivity and correctly to understand it may lead to under or over assess patients' pain. And patient preference should be considered as pain its nature, self-report as the gold standard to assess pain.

EQ-5D Pain Questionnaire this questionnaire reflected pain interference and pain intensity, but I-CVI and S-CVI of this questionnaire was not reported, so it needs to further research to explore.

9. Conclusion

Pain assessment as the first step of pain management, validated tools can accurately assess patient pain experience to provide optimal postoperative pain treatment plan. The tools including NRS, VAS, VRS, Wong-Face pain scale and 11-Face pain scale. CAPA as a validated tool too, it also can be used to conduct clinical pain assessment. Considering patients' preference NRS is best to assess pain intensity. But beyond pain score, pain assessment requires assess onset and pattern of pain, location of pain, quality of pain, pain aggravating and relieving factors, previous treatment and pain

effect, as well as assess barriers to pain assessment. Finally, patient satisfaction of pain management outcome can use Chinese Version of the revised American pain society patient outcome questionnaire to measure.

10. Limitations

Although the present review was conducted based on the systematic steps in conducting integrative literature review method, reviewers just assess the free full-text articles. In addition, this review was conducted based on independently literature review and personal opinion. It may cause potential bias of article critique. And the existing studies with good level of evidence may overlooked, so that the evidence is synthesis from ten articles may insufficient.

11. Implementation

Overall, these seven measurements Chinese revised APS-POQ-Rcanused to measurement the outcome of postoperative patient pain experience. And Numerical Rating Scale considering culture may has influence on the pain scale use, for example, colour circled pain scale was most preference and validity in the study of Ghana [13], and 11-Face pain scale were used in Thai, none of them can be used to Chinese, due to there is different culture in the different setting.

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