Original Article

The Effect of Implementing Pain Control Guidelines on the Pain of Patients Admitted to the Intensive Care Unit

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Abstract

Introduction & Objective: Pain is the most important stressor in the intensive care unit (ICU). The use of pain management protocols in the ICU, in addition to reducing anxiety and stress, lowers the duration of hospital stay. Therefore, this study was conducted to investigate the effect of implementing pain control guidelines on the pain of patients admitted to the intensive care unit (ICU).

Methods: This quasi-experimental study was conducted on 54 patients admitted to the ICU, who had been non-randomly allocated into two intervention and a control groups. The data collection tool was the Behavioral Pain Scale (BPS). The pain control guidelines were implemented for patients in the intervention group according to the pain pattern.

Results: Repeated measures test showed a significant difference between the intervention and control groups ($P < 0.01$) in terms of pain score, and the highest difference was observed at 1 hour after intervention, where the severity of pain in the intervention group was less than the control group.

Discussion and Conclusion: Based on the results of present study, it can be said that the implementation of pain control guidelines has an important role in relieving patients' pain in the ICUs. Therefore, educating and encouraging nurses to use pain control guidelines has an important role in reducing drug side effects and hospitalization time, and also increasing patient satisfaction.

Keywords: Guideline, Pain Control, Hospitalized Patient, ICU.

DOI: 10.47750/pnr.2022.13.S07.048

INTRODUCTION

Pain is one of the most common symptoms in patients admitted to the intensive care unit (1). Of the 5 million people admitted to the intensive care unit each year, 64% say they experienced pain at the time of admission (2).

Pain, as a stressor, is common among ICU patients. It increases catecholamine levels and physiological changes and causes instability in patients' hemodynamic status (3). Since most patients admitted to ICU require mechanical ventilation, this aggravates the pain of hospitalized patients (4). Patients undergoing mechanical ventilation may experience restlessness and confusion due to discomfort, pain, or lack of coordination with the device (5, 6).

Also, hospitalization in the intensive care unit will intensify the fear and confusion of patients due to the existence of complex and noisy devices, unfamiliarity with the hospital environment, lack of knowledge about the disease process, and fear of the future (7-9). Evaluation and management of pain in patients admitted to ICU is difficult due to decreased level of consciousness, lack of communication between patient and medical team, inability of patients in expressing pain, and administration of sedatives (10). Most ICU physicians and nurses have difficulty diagnosing pain (11, 12). Improper pain management increases hospitalization time and mortality rate (12). Medications and analgesics are used for most patients admitted to ICU to soothe and relieve pain (13). The use of painkillers to soothe and relieve pain is associated with side effects. The use of non-pharmacological methods plays an important role in pain control and management (14). Therefore, pain assessment by nurses and use of appropriate intervention to manage pain are very important (4). Pain management in patients admitted to ICU reduces the use of medications and sedatives (13). It also plays an important role in restoring the normal function of body's organs (1, 15). The use of pain

control protocols in the ICU in addition to reducing anxiety and stress lowers blood pressure in hospitalized patients (16). The implementation of pain control guidelines has an important role in reducing the confusion and delirium of patients admitted to the ICU (17). Also, the implementation of pain management methods, while reducing pain, calms patients during mechanical ventilation (18). Pain management, while causing relaxation, also reduces hospital complications (5). Today, there is a great deal of emphasis on the use of relaxation and pain relief methods in patients admitted to ICU, but we still see mismanagement in methods of pain relief in hospitalized patients (19). The use of treatment protocols and determining the optimal level of sedatives and analgesics based on clinical changes and patients' need for medication is one of the care challenges in patients admitted to ICU (6). Also, the implementation of pain relief protocols in hospitals is inadequate (3). Most pain controls in Iran are based on the understanding and judgment of physicians and nurses, and no specific guidelines or criteria are used to control pain (5). Therefore, the researcher in this study decided to examine the effect of implementing pain control guidelines on the pain of patients admitted to the ICU.

METHOD

This experimental study was conducted on 52 patients admitted to the ICU in 2021. The environment of this study was the ICU of Hakim Jorjani Hospital. Criteria for entering the study were; having no severe injuries, having the ability to move at least one limb, having level of consciousness of between 5 and 8 on Glasgow scale despite the endotracheal tube, and being under mechanical ventilation with CPAP, SPONT mode. All participants in this study were between 18 and 60 years old. The study was started 48 hours after patient admission to ICU. Exclusion criteria included; having no history of alcohol or drug use, having the diagnosis of quadriplegia, spinal cord injury, liver or kidney disease, and requiring continuous sedatives or high muscle relaxants during hospitalization.

The sample size of this study was calculated to be 52 people (n=26 in each group) based on the Yeganeh's study (2018) with an effect size of 1.04 and confidence interval of 95% at a significance level of 0.05 (6).

The tool used in this study was the Behavioral Pain Scale (BPS), which was designed and psychometrically evaluated by Aïssaoui (2005), (20). Scoring of this scale, which is based on the three sections of face shape, upper limbs and compatibility with the ventilator ranges from 1 to 4 in each section, and its final score is between 3 and 12 with higher score indicating higher level of pain (21). This scale has been translated and psychometrically assessed by Heidarzadeh (2017) in Iran. Face validity, content validity and criterion validity of this scale have been confirmed. Its reliability has also been confirmed by Cronbach's alpha coefficient of 0.74- 0.94 (22). Sedighi (2019) has calculated the content validity (CVR = 0.84) and the reliability of this scale by Cronbach's alpha coefficient of 0.9 (4). In the present study, the content validity of this scale was confirmed by 10 faculty members and 2 anesthetists.

To conduct this study, after approving the plan and receiving the ethics code: IR.IAU.CHALUS.REC.2020.019 from Chalous Islamic Azad University, the researcher first explained the objectives of the study to the hospital officials, the participants, their next of kin and the anesthesiologist, and obtained permission from the head nurse. Then, a written consent was obtained from the samples. The participants were divided into two intervention and control groups based on the inclusion criteria by non-random sampling method. In this study, since relaxation technique could have a learning effect on nurses, first, the data of control group was collected. The routine care of the ICU was implemented for patients in the control group according to the instructions of a specialist physician under the supervision of an anesthetist. But, 2 sessions of 30-40 minutes workshop were held for the intervention group by the researcher together with the anesthetist before the intervention. In this study, 6 ICU nurses and 4 final year students of anesthesiology and nursing collaborated with us.

In the workshop, in addition to the ICU's routine care, interventions such as how to diagnose the pain of patient admitted to ICU, how to properly suction the patient, how to change patient position in a timely manner and how to calculate medication dose were taught to nurses. Based on the guidelines, the nurses first assessed patients' pain by BPS scale, and if they had pain, first checked their position and corrected it if necessary. Then, they suctioned patients' airway and prescribed oxygen to solve the problem of hypoxia according to the physician's instructions. If there was pain, midazolam was injected with morphine according to the anesthetist's instructions. The injection of these drugs was initially calculated as a bolus according to the patient's weight. Depending on the patient's pain score, the dose of medication was increased or decreased according to the anesthetist's instructions. The patient's pain was assessed 10 minutes after the implementation of protocol, because the patient could be provoked immediately after the initiation of nursing care protocol itself. Then, 1 hour after the re-implementation of the protocol, the patient's pain was evaluated again. In the control group, the level of pain was assessed before the routine care, and then 10 and 60 minutes later.

Data were analyzed by descriptive statistics (table, mean and standard deviation) and inferential statistics (paired t-test, independent t-test and Rapid Major Test) at a significant level of 0.05.

FINDINGS

The mean age of patients in the intervention group was

43.66 (6.73) years and in the control group was 42.92 (5.73) years. Independent t-test showed no significant difference between the two groups in this regard (P = 0.65). Chi-square test did not show a significant difference between the two groups in terms of gender (P = 0.17).

The pain score before intervention in the intervention group was 8.07 (1.41) and in the control group was 8.42 (1.72). Independent t-test did not show a significant difference between the two groups in this regard before the intervention (p = 0.43).

The score of pain 10 minutes after intervention in the intervention was 6.5 (1.44) and in the control group was 7.61 (1.29). Independent t-test showed a significant difference between the two groups in this regard (p = 0.005).

The score of pain 60 minutes after intervention in the intervention group was 5.5 (1.22) and in the control group was 6.57 (1.41). Independent t-test showed a significant difference between the two groups in this regard (P = 0.009).

Repeated Measures test also showed a significant difference between the two groups in terms of the pain score (P <0.01), and this difference was mostly observed in the intervention group 10 minutes and 1 hour after the intervention.

Table 1: The effect of implementing pain management guidelines on the pain of patients admitted to the ICU

Time / Group	**Before intervention**	**10 minutes after intervention**	**1 hour after intervention**	**P-Value**
Intervention	8.07(1.41)	6.5(1.44)	5.5(1.22)	0/01 P<
Control	8.42(1.72)	7.61(1.29)	6.57(1.41)	0/01 P<
P-Value	P= 0/43	P= 0/005	P= 0/009	

Discussion and Conclusion

The aim of this study was to evaluate the effect of implementing pain control guidelines on the pain of patients admitted to the ICU. The results showed that the implementation of pain control guidelines reduced the pain of patients admitted to the ICU. Therefore, it can be said that increasing the ability of nurses to diagnose and monitor pain, and also use pharmacological and non-pharmacological pain relief methods has an important role in reducing pain in hospitalized patients (4).

Ghasemiyeh (202) stated that, the correct regulation and use of analgesia in patients admitted to ICU plays an important role in managing pain and reducing complications. This is because the distribution, metabolism, absorption and elimination along with the serum level of medications in the patients admitted to ICU are different from other patients (23). Pain causes stress and increases catecholamine levels. It also causes changes in the speed and depth of breathing. Proper pain management plays an important role in reducing hospital complications (24). Keykha (2014) believed that implementation of pain control guidelines calms the hospitalized patients, reduces their pain during hospitalization, and shortens the duration of mechanical ventilation in patients admitted to ICU (25). Walker (2019) argued that pain management reduces drug use and increases relaxation (13). Phillips (2019) stated that use of pain relief protocols plays an important role in the relaxation of patients admitted to ICU (26). Ross (2020) showed that nurses, by using relaxation techniques and pain management protocols, in addition to reducing patients' stress and pain, shorten the duration of mechanical ventilation (27). Relaxation reduces muscle tension, lowers blood pressure, controls stress, and maintains physiological and psychological balance in patients (28). Relaxation techniques reduce mechanical complications and decrease the risk of coma, cardiac arrest, bradycardia, renal failure and drug accumulation in the body, all of which reduce stress in patients (5). Pain management in patients admitted to the intensive care unit reduces the use of drugs and complications caused by hospitalization (2). Among positive consequences of patient relaxation are; reduced muscle tension, increased adaptation, pain relief, improved sleep and reduced anxiety (29).

By identifying behavioral changes of pain, nurses can observe the symptoms and complications of pain in hospitalized patients, and based on it, perform relaxation and pain control techniques (10). Therefore, increasing the ability of nurses to diagnose and monitor pain, and also use pain relief methods has an important role in pain control (4). Nurses by using non-pharmacological methods of pain relief can play an important role in controlling pain in hospitalized patients (13, 14).

According to studies, pain management has an important role in restoring normal function of hospitalized patients (1). Behavioral model of pain reduces pain and dependence on mechanical ventilation in ICU patients (4). Proper use of pain relief methods plays an important role in relieving and reducing pain in patients admitted to the ICU (30). Sedighi (2019) in a study showed that 80% of ICU nurses did not diagnose pain, but after training, 56.7% of patients were diagnosed with pain (4).

Therefore, teaching pain control methods has an important role in increasing the knowledge and skills of nurses in the intensive care unit (31, 32), and nurses' skill in using pain control methods has an important role in reducing patients' pain (33). Unfortunately, most studies have shown that intensive care unit nurses do not have enough information about methods of diagnosing and relieving pain. Education along with documenting patients' pain plays an important role in reducing pain (4).

According to the results of studies, it can be said that nurses, as a member of health team who spend a lot of time with patients, have a key role in reducing patients' pain (29, 34).

The use of pain relief and pain control methods has an important role in increasing the physiological and mental health of hospitalized patients (28).

Considering the results of this study, similar studies are suggested to be performed on other hospital diagnoses. One of the limitations of this study was the novelty of using pain control protocol for nurses. Another limitation was that, the nurses' anxiety levels were not assessed before and after the intervention. Also, the use of non-random sampling method and non-standardization of sensory and acoustic stimulus conditions in the ICU were among other limitations of this study. Similar studies are recommended in the more controlled environments to remove these limitations.

CONCLUSION

Considering the effectiveness of pain control guidelines on reducing pain in patients admitted to the ICU, it can be said that the use of pain control program has an important role in relieving patients' pain. This in turn increases patients' satisfaction and reduces the use of painkillers, drug side effects, length of hospital stay and patients' costs. Hospital managers and officials are suggested to hold training courses and encourage ICU nurses to use these methods in a proper manner. Pain control guidelines play an important role in improving the quality of nursing care.

ACKNOWLEDGMENTS

The researchers consider it necessary to express their gratitude to the esteemed officials of Hakim Hospital who helped us in carrying out this study. This plan has been approved by the Student Research Committee of the Islamic Azad University, Aliabad Katoul Branch, with the ethics code: IR.IAU.CHALUS.REC.2020.019.

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