



Research on the Emergency Nursing Value of Comprehensive Nursing Intervention for Patients with Severe Traumatic Shock

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ABSTRACT

Traumatic shock (TS) is a lethal condition that may result from substantial hemorrhage and tissue damage consequent to physical injury. It results in severe decrease of blood volume and defective flow of microcirculation which negatively affects all organs of the body. It also causes health related psychological disturbances such as anxiety and pain which makes the clinical condition of the patient worse. Effective and appropriate emergency interventions are significant in the promotion of desirable patient outcomes during calamity care. This study was intended to assess the outcome of generalized multiple-category interventions in emergency severe traumatic shock. A total of 90 patients, admitted to our hospital between October 2020 and September 2022, were randomly divided into two groups: The control group who was comprised of 45 individuals received only the routine nursing care while the experimental group that also comprised of 45 participants received the comprehensive emergency nursing interventions in addition to the routine care package. The result measures included the following; rescue time, rescue success rate, cure rate, disability rate, mortality rate, blood pressure recovery rate, rate of complication incidence, and the level of satisfaction



of the nurses. Mean rescue time and success rate of the experimental group was less and higher respectively than that of the control group which was found statistically significant ($p < 0.05$). The experimental group also achieved better results in cure rates, disability and mortality and systolic / diastolic blood pressure recovery ($p < 0.05$). In addition, the experiment group showed a lower rate of thrombosis, organ injury, and infection ($p < 0.05$). Another reason for the difference was that there was greater satisfaction among the members of the experimental group of nurses. Therefore, the approach to nursing interventions dramatically enhances the scope, rescue times, organ, and clinical outcomes of patients with severe traumatic shock, decreases complications, and increases patients' satisfaction.

Keyword: Comprehensive nursing intervention, Severe traumatic shock, Emergency nursing

1. Introduction

Shock can lead to acute microcirculatory insufficiency and insufficient tissue blood perfusion, and severe patients can lead to hypoxia, acidosis and vital organ dysfunction. When the patient has the manifestations of early shock, it needs to be paid attention to, and sent to the nearest hospital for treatment as soon as possible, so as to prevent the further aggravation of the condition and gain time for rescue. Severe traumatic shock (TS) is a common critical illness in clinical emergency department. The main causes of its occurrence include damage to important organs or abnormal blood circulation and insufficient microcirculation perfusion caused by massive bleeding. After the trauma is formed, patients often have severe pain, and are prone to negative emotions such as anxiety and restlessness (Du Yaming, 2017; Ji Yanan, 2017), with urgency and suddenness, the disability rate and fatality rate are relatively high, and the most direct result is the death of the patient (Wang Xiuping, 2019). Severe TS patients are often caused by traffic accidents, machine injuries, fall injuries, and other accidents, and the main contributing factors are external force and trauma (Lin Tingting, 2017; Song Yanjuan, 2020). Emergency rescue after the onset of severe TS patients is very important, which is of great significance for saving the lives of patients and avoiding serious consequences. An important part of the process of first aid to patients is nursing cooperation, which is an important guarantee for the smooth progress of emergency rescue. In addition, patients with severe traumatic shock are also prone to various complications during rescue and treatment, especially massive bleeding. The above situation shows that severe traumatic shock is more complicated than conventional shock symptoms, and requires more complete intervention in nursing care



(Zhang Qinghong, 2020). The nursing work during the rescue process has a direct impact on its effect and improvement of prognosis. Under such circumstances, it is necessary to analyze better emergency nursing methods (Song Liwei, 2018). As an important part of the emergency rescue process, nursing cooperation is also an important guarantee for the smooth progress of emergency rescue.

Comprehensive nursing is a relatively new nursing intervention model, which is mainly aimed at the injury site and the degree of the patient's condition. Most patients and their families lack basic knowledge of the rescue of severe trauma, and the treatment process is accompanied by severe pain. It is easy to cause anxiety, panic and other negative emotions in patients, poor compliance, resistance or even refusal to cooperate with medical staff, which affects the smooth implementation of the treatment process. At present, the clinical treatment methods are diversified, and in the actual implementation, the assistance of nursing staff is needed to successfully complete the treatment of patients (Tian Yuan, 2016; Wang Chengrong, 2020). Carry out targeted nursing intervention, rescue nursing and drug nursing implementation, etc., to ensure the patient's airway patency, timely control the bleeding, and reasonably deal with the injured part. Nursing intervention also requires patients to actively cooperate with technology, so as to improve the overall quality of nursing services and implementation efficiency (Xuan Hongyan, 2018). Comprehensive nursing interventions need to prepare a rescue plan in advance, clarify and organize each step in the rescue plan, and assign all aspects of the rescue task. At the same time, the nurses are clear about their work responsibilities, and they can be closely linked from the beginning of receiving patients to the subsequent treatment links, establishing a green channel for emergency rescue patients, and ensuring that the treatment of patients can be completed in a short time. After adopting comprehensive nursing intervention, special nursing can improve the pertinence of nursing work, strengthen the care of the patient's respiratory tract, maintain smooth breathing, and reduce the risk of suffocation. By following the doctor's advice and rational medication, the disorder of the patient's internal environment can be corrected, which has significant significance in improving the success rate of rescue. In addition, with the optimization of the emergency nursing process, the effect of emergency work can be improved, coupled with the psychological counseling of patients and their families, it can maintain the normal progress of the nursing and rescue process, which is conducive to avoiding the interference of family members on the rescue work (Xu et al., 2022).

To examine the prospect of upgrading the emergency nurse program for extremely shocked



patients, and implementing more efficient reconnaissance technique. This study presents a new and an elaborate nursing program, and evaluates the effectiveness of nursing care intervention and nursing care received by the patients in the past two years in the our facility hospitals with a view of advancing best practices for nursing care among patients with severe traumatic shock.

2. Methods and Materials

2.1 Basic information

For this study, 90 patients with traumatic shock who were treated within our facility in the period starting from October 2020 and ending in September 2022 were set as subjects of investigation. The abovementioned patients were also subjected to on the average a random allocation and were equally distributed into the control and observation groups with 45 patients in each set and all patients were refered to hospital for rescue immediately after sustained trauma. Out of them, the control group: 28 males and 17 females; the age interval of the patients was 15 to 66 years with the mean age of the study population being (45.16 ± 5.07) years; the time from the point of onset of hypovolemic shock to the time of delivery of the patient to the hospital ranged between 12 to 137 minutes with mean range of (50.33 ± 10.10) minutes; Out of the sample, 13 cases suffered machine injuries, 18 cases were victims of traffic accidents, 9 sustained injuries from fall, and 5 others. According to the information obtained in the study, there were no statistically significant differences between the two groups with respect to pathogenic factors, gender, age, time and place of the hospital and other general information ($P > 0.05$), and the two socio demographic groups were comparable.

2.2 Inclusion and exclusion criteria

Inclusion criteria: The patient is in a normal state of mind and is able to interact and communicate normally.

Exclusion criteria: patients who are with severe heart, kidney and other organic diseases; patients who are with blood or endocrine diseases; patients who are with previous history of allergic reaction towards the anesthesia; pregnancy or people who are lactating.



2.3 Nursing method

The control group received routine nursing care, and paid close attention to changes in the patient's vital signs, mainly including monitoring pulse and blood pressure, measuring the patient's blood pressure, etc., promptly cleared nasal and oral secretions, kept the patient's airway open, and accurately assessed the degree and duration of shock. Replenish blood volume as soon as possible according to the patient's shock condition and ischemic volume. Actively cooperate in the rescue process and implement rescue and nursing measures.

Patients in the observation group received comprehensive nursing intervention on the basis of routine nursing, mainly including: (a) Strengthen the management of emergency care. As an emergency nurse, a rescue plan should be formulated in advance, and various tasks and specific steps should be clarified during the rescue process, so that the emergency rescue tasks can be reasonably allocated. Every medical staff should clarify their work tasks and enhance their sense of responsibility, so as to avoid loopholes in emergency rescue work to the greatest extent. From receiving patients to rescuing patients, the treatment process and the later task handover between wards should be dispatched and deployed by unified personnel. Relevant medical staff should clarify the patient's condition, rescue treatment, etc. It is necessary to plan the whole process of patients entering the emergency department to rescue, treatment, and post-ward nursing handover, reasonably deploy and adjust the working links of shock treatment, and be aware of the rescue procedures and treatment conditions so that all links can be closely connected, try to complete the treatment of patients in a short time, and minimize the loopholes in the emergency work as much as possible. Only in this way can the links and steps be closely connected, which can not only improve work efficiency, but also maximize the probability of successful rescue. At the same time, the professional skills, nursing awareness and comprehensive quality of the medical staff should be comprehensively cultivated and trained, so that the medical staff can show stability and not be impatient during the emergency rescue process, and can complete the emergency rescue and nursing tasks as quickly as possible.

(b) Provide timely psychological care to patients. Traumatic shock is mostly caused by sudden external factors. Patients and their family members lack sufficient psychological preparation and have large mood swings. Pay attention to verbal attitudes and behavioral factors during the conversation, so that patients and their families can stabilize as soon as possible. In the process of psychological care for patients, nurses should take the initiative to communicate with



patients, establish and carry out discussion groups, and take targeted measures to solve problems. There is also the possibility of dealing with patients' and their families' concerns regarding disease treatment and nursing plans through proactive answers and information which can be provided by the nurses during the treatment process. In this way, it is possible to ease the nervousness and evaluate the anxiety of the patient and help in maintaining a happy mood which is very important in the recovery of the disease. However, for patients with serious psychological disorders, nursing staff association must be emphasized, whereby a one-on-one psychological assessment model was adopted to aid in neutralizing negative emotions of patients, and to help maintain a positive outlook in patients. Moreover, the medical staff must maintain the temperature and humidity ranges appropriate to the human body for the comfort of the patient at all times, maintain cleanliness in the patient's hospital environment, and take necessary measures every once in a while to change the air in the ward.

(c) Open a green channel for emergency rescue patients. First-time treatment, nurses should quickly and accurately complete the care in emergency care. After receiving the first aid information from the patient, the nurses immediately prepare comprehensive rescue equipment and follow the ambulance to the emergency scene to understand the patient's condition and formulate an emergency plan in a short time; after the patient entered the rescue room, the nursing staff helped him put on the mask and gave oxygen, closely observed the patient's electrocardiogram, blood pressure and other basic conditions, and gave cardiopulmonary resuscitation if necessary. At the same time, the patient is injected with an appropriate amount of sedative and analgesic drugs to achieve the effect of pain relief; during the rescue process, the nursing staff should closely cooperate with the attending physician to quickly and accurately deliver the rescue items; patients with severe traumatic shock, due to the accelerated blood flow, the nursing staff should indwell the urinary catheter and gastric tube for the patient as soon as possible, and establish an intravenous infusion channel, keep the patient supine, keep breathing unobstructed, remove foreign objects in the mouth in time, and choose to use a mask for oxygen inhalation, or use a ventilator for assisted ventilation.

(d) Provide personal care to patients. For patients with severe traumatic shock, it is usually difficult to take care of themselves in daily life, and special personnel are needed to help the patient adjust to an appropriate position, and the body and head need to be raised by 20-30°, and the lower limbs should be raised by 15-30°, prevent the movement of internal organs in the abdominal cavity and seriously affect the functions of the heart and lungs, so as to promote



blood perfusion in the brain, ensure the normal circulation of cardiology blood, and facilitate follow-up rescue and treatment.

(e) Implement drug interventions. Establish two venous accesses in time to expand the volume of the patient, and use alkaline drugs as directed by the doctor to correct the internal environment balance of the patient, and use vasoactive substances rationally to increase the blood pressure of the patient to maintain the supply of blood oxygen. During the infusion period of the patient, scientifically adjust the infusion speed, etc., to prevent the patient from phlebitis during the infusion.

2.4 Observation indicators and judgment criteria

(a) Detailed records and statistics of the effective rescue time and rescue success rate of the two groups of patients; (b) Patient's prognosis (cure rate, disability rate and death rate); (c) The blood pressure changes of the two groups of patients were analyzed; (d) The incidence of complications in the two groups. Mainly include thrombosis, organ injury, post-traumatic infection, crush syndrome; (e) Compare care satisfaction. The patient treatment satisfaction questionnaire self-made by our hospital is used for evaluation. There are a total of six items, which are divided into three levels: very satisfied, satisfied and dissatisfied, with a total of 10 points. Very satisfied is greater than or equal to 9 points, and satisfied is 6 to 9 points, less than 6 points are dissatisfied. Overall satisfaction rate = very satisfied + satisfied.

2.5 Statistical analysis

The data in this research were analyzed by SPSS 26.0 software, including counting data and measurement data. The former is represented by “[n (%)]” and “ χ^2 ” is used for testing, and the latter is represented by “Mean \pm Standard Deviation”, and take “t” to carry out the test, if $P < 0.05$, it can be confirmed that there is a significance in the data difference.

3. Result

3.1 Comparison of rescue indicators

The results show (**Table 1**) that the effective rescue time of the observation group was significantly shorter than that of the control group, and the difference was significant ($P < 0.05$) (**Figure 1**); the rescue success rate of the observation group was 95.55%, significantly higher



than 86.67% of the control group.

Group	Effective rescue time (min)	Rescue success rate (%)
Observation group (n=45)	44.53±5.15	43 (95.55)
Control group (n=45)	73.68±4.66	39 (86.67)
<i>t</i>	-28.155	2.195
<i>P</i>	0.000	0.138

Table 1. Comparison of rescue indicators

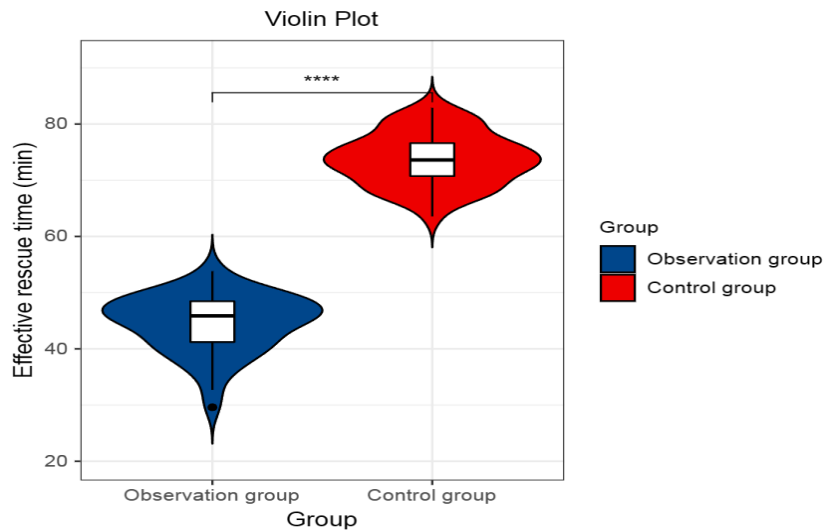


Figure 1. The violin plot of the comparison of effective rescue time (minutes) between the two groups

3.2 Comparison of post-treatment conditions

After comparing the cure rate, disability rate and death rate of the two groups, it can be clearly seen that the cure rate in the observation group is better than that of the control group, and the disability rate and death rate are lower than that of the control group (**Table 2, Figure 2**). The cure rate of the observation group was 73.33%, the disability rate was 22.22%, and the mortality rate was 4.44%. The cure rate of the research group was 55.55%, the disability rate



was 30.00%, and the mortality rate was 11.11%.

Group	Cured	Disabled	Death
Observation group (n=45)	33 (73.33)	10 (22.22)	2 (4.44)
Control group (n=45)	25 (55.55)	15 (30.00)	5 (11.11)
<i>t</i>	7.619	1.385	1.394
<i>P</i>	0.006	0.239	0.238

Table 2. Comparison of prognosis of patients [n (%)]

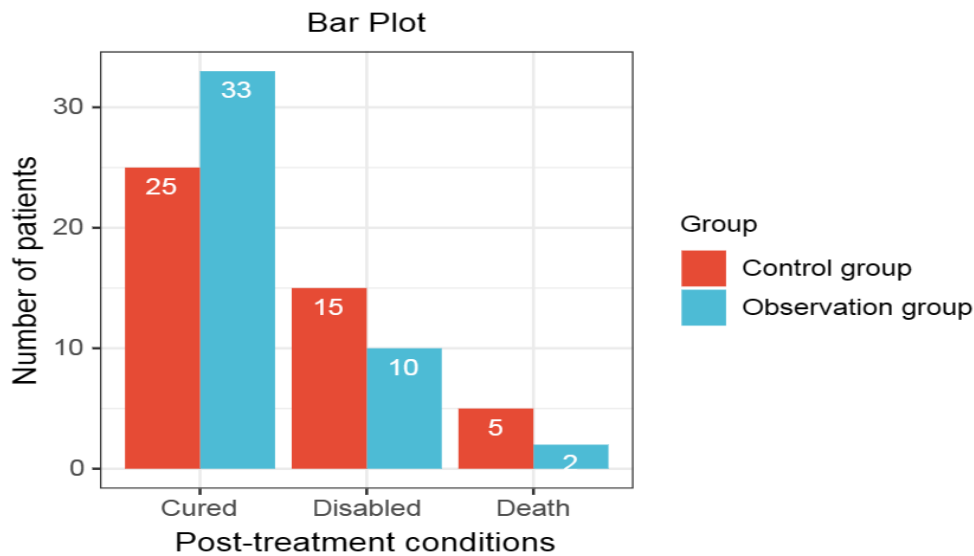


Figure 2. Bar plot comparing the prognosis

3.3 Patient's blood pressure changes

After nursing the two groups of patients, the systolic blood pressure, diastolic blood pressure, and mean arterial pressure recovery of the observation group were better than those of the control group, and the difference between the groups was statistically significant ($P < 0.05$) (Table 3, Figure 3-5).

Group	Systolic blood pressure	Diastolic pressure	Mean arterial pressure
Observation group	100.86±5.85	66.50±6.53	77.80±5.34



(n=45)			
Control group (n=45)	94.38±5.10	60.67±7.42	70.95±6.30
<i>t</i>	5.601	3.957	5.064
<i>P</i>	0.000	0.000	0.000

Table 3. Changes in blood pressure of two groups of patients (mmHg)

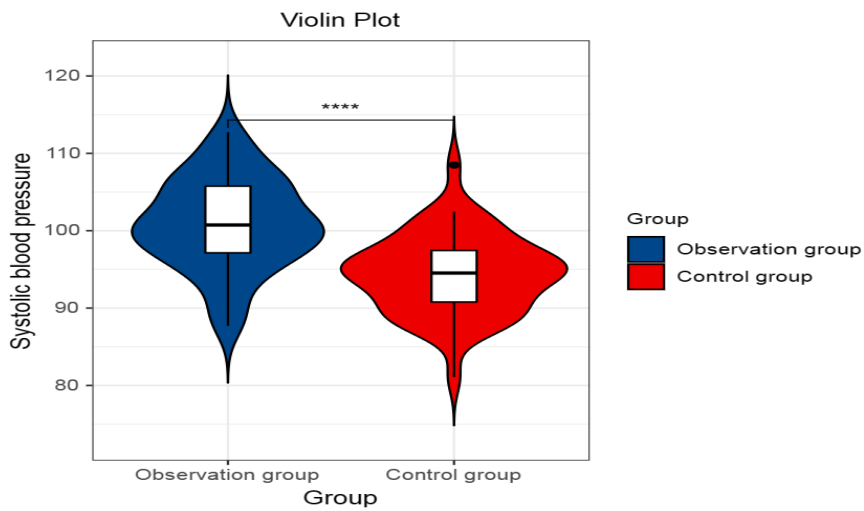


Figure 3. Violin plot comparing systolic blood pressure

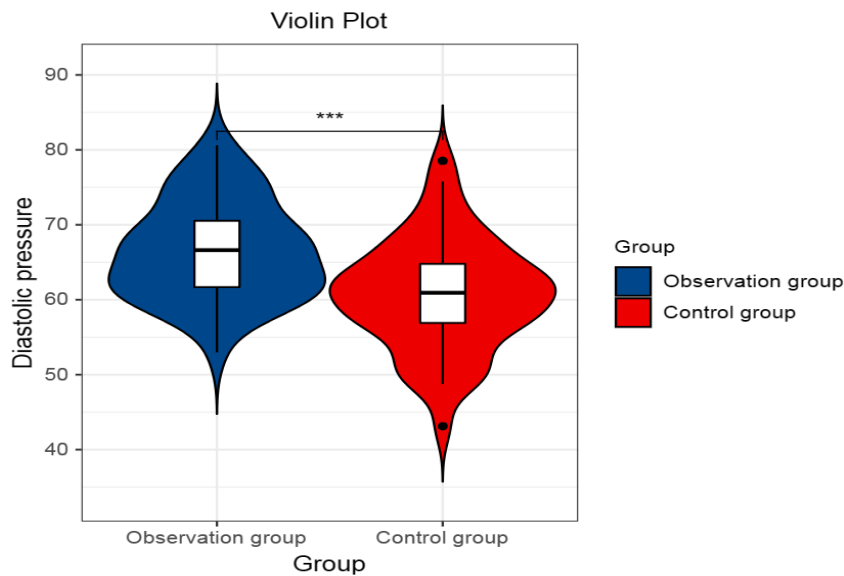


Figure 4. Violin plot of diastolic blood pressure comparison

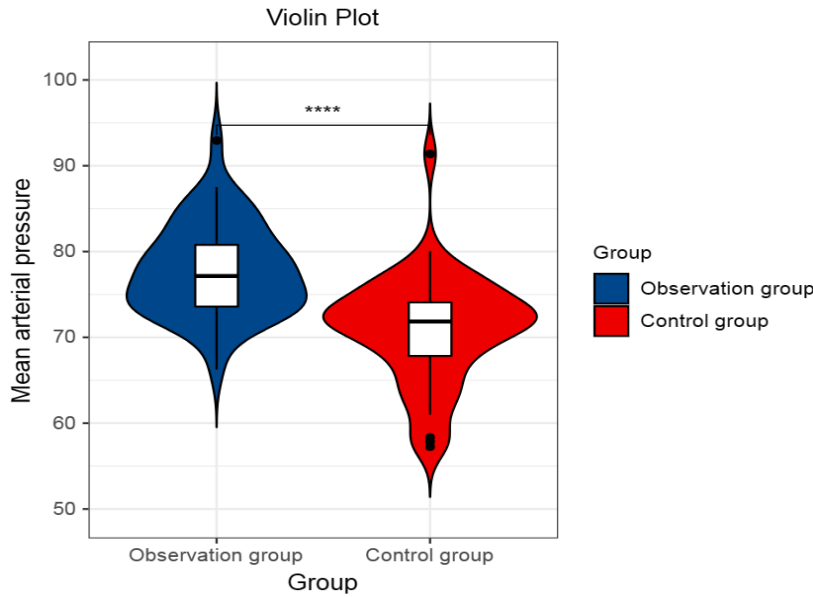


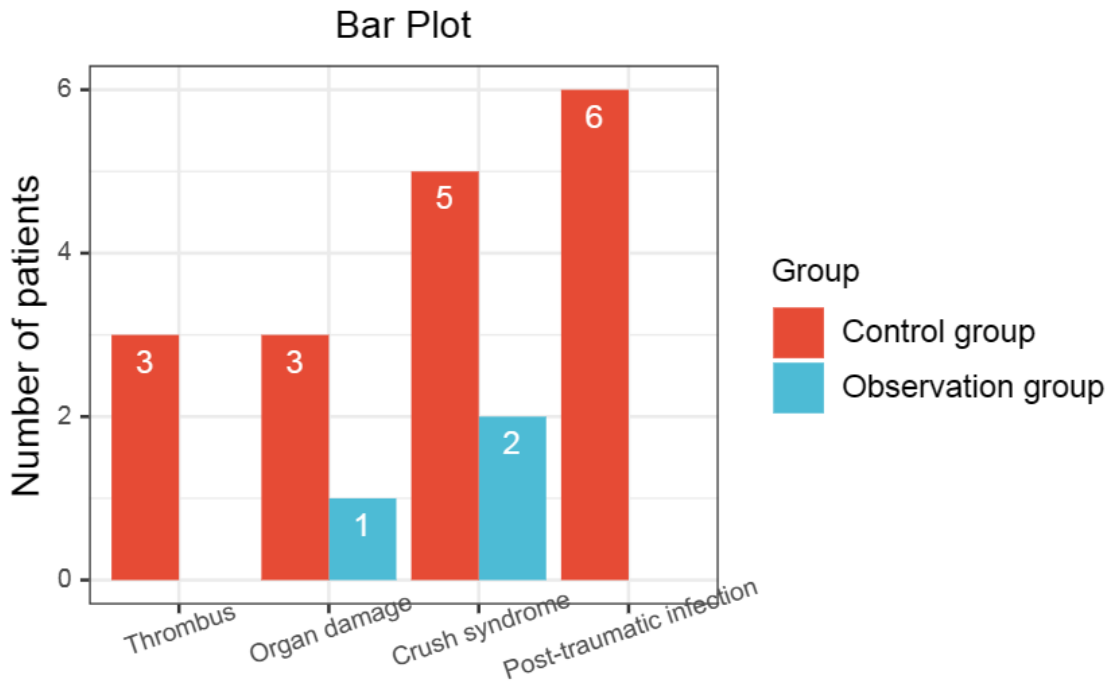
Figure 5. Violin plot of mean arterial pressure comparison

3.4 Complications compared

After nursing, the incidence rates of various complications (thrombus, organ damage, crush syndrome and post-traumatic infection) in the observation group were significantly lower than those in the control group, and the differences were statistically significant ($P < 0.05$) (Table 4, Figure 6).

Group	Thrombus	Organ damage	Crush syndrome	Post-traumatic infection	Total
Observation group (n=45)	0	1 (2.22)	2 (4.44)	0	3 (6.67)
Control group (n=45)	3 (6.67)	3 (6.67)	5 (11.11)	6 (13.33)	17 (37.78)
<i>t</i>	3.103	1.047	1.394	6.429	12.600
<i>P</i>	0.078	0.306	0.238	0.011	0.000

Table 4. Comparison of complications [n (%)]



Complications

Figure 6. Bar plot comparing complications

3.5 Comparison of nursing satisfaction

The patient treatment satisfaction questionnaire self-made by our hospital was used to investigate and make statistics (**Figure 7**). The overall satisfaction of the observation group was higher than that of the control group, and the difference was statistically significant ($P < 0.05$) (**Table 5**).

Group	Very satisfied	Satisfy	Dissatisfied	Overall satisfaction
Observation group (n=45)	30 (66.67)	15 (33.33)	0	45 (100)
Control group (n=45)	14 (31.11)	21 (46.67)	10 (22.22)	35 (77.78)
P	0.001	0.197	0.001	0.001

Table 5. Comparison of nursing satisfaction [n (%)]

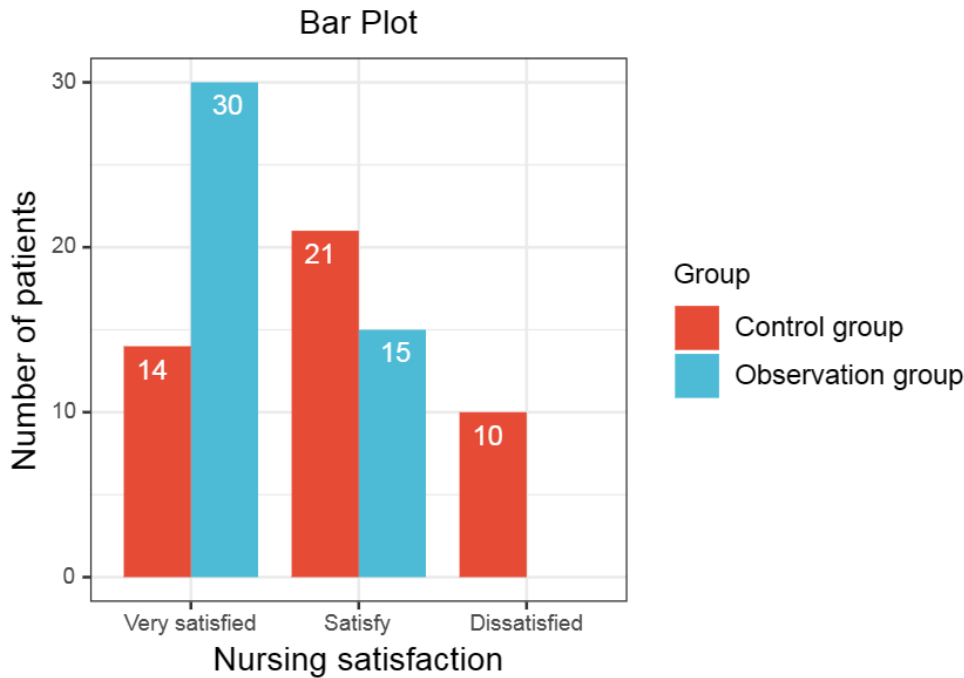


Figure 7. Bar plot comparing nursing satisfaction

4. Discussion

Severe trauma patients often suffer from shock, which is a relatively common critical illness in clinical practice. In the context of rapid modernization, infrastructure industries such as the construction industry and the transportation industry have achieved rapid development. It also brings certain hidden dangers to the people and workers, and more and more serious traumas are caused by work-related injuries and traffic accidents (Guo Qiong, 2015; Xu Jing, 2017). After a patient suffers from severe traumatic shock, acute hypoxic symptoms are prone to occur in the body, causing the brain and organs to lack oxygen supply, which in turn affects cell metabolism and normal function, and even threatens their life safety. Shock is a clinical syndrome caused by acute tissue insufficiency. There are different causes of shock. However, shock still has a common feature: insufficient effective circulation can easily lead to tissue hypoperfusion, which in turn leads to systemic tissue, poor blood perfusion of organs, lead to a series of pathophysiological changes in patients, such as: tissue hypoxia, microcirculation stasis, organ dysfunction, abnormal cell metabolism, etc.; the main clinical manifestations of shock include: blood pressure drop, extremity cyanosis, clammy limbs, weak pulse, general weakness, confusion, etc. Severe traumatic shock has a certain clinical incidence rate, the



condition is generally critical, and the onset is rapid, the disability rate is high, and the condition deteriorates rapidly. If the patient misses the best rescue time, it will pose a very serious threat to the patient's life safety (Zhang et al., 2020; Zuo Lijun, 2012). For now, emergency treatment of patients with severe traumatic shock is a common way, mainly based on basic signs such as bleeding and breathing of patients for rapid rescue, to minimize the treatment time of patients and improve the success rate of rescue, in order to provide more systematic and holistic nursing interventions for patients with severe traumatic shock (Arcari et al., 2021; Tang Yuzhen, 2010).

Severe traumatic shock is a more dangerous condition, because the oxygen supply of tissues and organs is reduced, and abnormalities in cell metabolism, function and morphology are prone to occur. For severe traumatic shock, rescue should be carried out as soon as possible, an appropriate amount of blood volume should be added, and the injured part should be treated as soon as possible. Because of the complexity of the disease, the nurses actively cooperated with the doctors during the specific treatment process to complete the treatment of the patient in the shortest time (Caulfield et al., 2023). At this stage, emergency treatment is mostly used clinically, that is, rapid rescue is given according to the patient's breathing, complexion, bleeding, and consciousness. In order to shorten the treatment time of patients and maximize the success rate and survival rate of patients, it is necessary to provide systematic, individualized, and holistic nursing interventions for patients with severe traumatic shock (Chen Jianhuan, 2013; Wang Wei, 2011). Comprehensive nursing intervention is a new nursing model commonly used in emergency departments in recent years, provide special care, emergency care, medication care, respiratory care, etc. for patients, in order to ensure the smooth airway of patients, control bleeding in time, and rationally handle and disinfect the injured parts, patients and their families can be guided to actively cooperate with clinical first aid operations, to ensure the quality of life of patients as much as possible, and to improve the quality and efficiency of emergency care (Gao Haiying, 2006; Zhang Huirong, 2003). Comprehensive nursing refers to a high-quality nursing model in which the process is usually closely connected and integrates various operational links (Mota, n.d.; Mousavi-Derazmahalleh et al., 2018). This nursing model adopts a holistic, continuous and systematic nursing procedure, which integrates the advantages of various nursing models. Applying it to rescue care, a smooth, systematic and comprehensive nursing procedure can effectively save rescue time and improve the quality of care, thereby maximally saving patients' lives and reducing the occurrence of complications (Zheng & Liu, 2020).



The comprehensive nursing intervention work revolves around the "patient-centered" service concept, formulates reasonable nursing plans and emergency measures according to the actual situation of hospital departments and the severity of patients' trauma, implements the nursing work to the details, implements unified planning and task assignment, it helps the staff to form a tacit cooperation and effectively combine different nursing links (Li et al., 2021; Zhang Qin, 2021). At the same time, nursing staff should enrich themselves in normal times, actively participate in professional first aid knowledge training, actively carry out practical operations, improve self-worth, be able to make preliminary judgments on the condition proficiently in clinical work, grasp the direction of dynamic changes in the condition, and improve nursing efficiency (Ghimire et al., 2021; Ning Yanmei, 2016). In addition, nursing staff should pay attention to the psychological changes of patients and their families, answer their questions patiently and carefully, provide targeted psychological counseling, popularize trauma recovery self-care skills, and relieve negative emotions such as anxiety and tension. And encourage patients to maintain a positive and optimistic attitude to cooperate with the nursing staff, so that patients can experience the care and love of medical staff, and help to build a harmonious nurse-patient relationship (Phaken et al., 2022).

Through the analysis of the two groups of patients in various aspects in this study, we found that the implementation of comprehensive nursing in emergency treatment can effectively improve the success rate of rescue, reduce the occurrence of complications, shorten the effective rescue time, and reduce the occurrence of complications. Promote the return of blood pressure to normal levels and return to normal as soon as possible. It can effectively improve its prognosis and rehabilitation effect, and at the same time, it can also improve the cooperation degree and operation quality of medical staff in the rescue process, thereby improving the satisfaction of nursing care, which is worthy of promotion and application.

Conclusion

This study aimed to assess the emergency nursing value of comprehensive nursing interventions for patients with severe traumatic shock. The results demonstrated that comprehensive nursing interventions significantly improved patient outcomes compared to routine care. The observation group experienced a shorter rescue time, a higher rescue success rate, and better post-treatment recovery, with improved blood pressure, fewer complications, and higher nursing satisfaction. These findings fulfill the study's objective, confirming that comprehensive nursing interventions enhance the effectiveness of emergency



care in traumatic shock cases. The structured approach to care, including psychological support, quick response, and coordinated treatment, directly contributed to improved patient prognosis, with higher cure rates and lower disability and mortality rates. The study's scientific contribution lies in providing evidence that comprehensive nursing interventions improve clinical outcomes in trauma care. It highlights the importance of integrated, timely, and personalized care, offering insights that could enhance emergency department protocols and patient management strategies. Overall, the study underscores the value of comprehensive nursing in critical care settings, supporting its broader application for better patient outcomes.

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