

Application of Improved Emergency Integrated Nursing in the Treatment Effect and Safety of Emergency Trauma Patients

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Abstract: *Objective:* To analyze the impact of improved emergency integrated nursing on the treatment effectiveness and safety of emergency trauma patients. *Methods:* Study duration: December 2024 to December 2025. Observation target: emergency trauma patients in our hospital. Sample size: 92 cases. Using computer-based grouping, the 92 patients were divided into two equally sized groups: a control group of 46 patients who received conventional emergency nursing care, and an observation group of 46 patients who underwent an improved emergency integrated nursing model. The treatment-related indicators, treatment effectiveness, and incidence of adverse events were evaluated in both groups. *Results:* After intervention, the pre-hospital emergency care time, emergency diagnosis time, total emergency rescue duration, and examination waiting time in the control group were all longer than those in the observation group ($p < 0.05$); the treatment effectiveness in the control group (effective rate: 82.61%) was worse than that in the observation group (effective rate: 95.65%), $p < 0.05$; compared with the control group, the observation group had a lower incidence of adverse events, $p < 0.05$. *Conclusion:* Implementing an improved emergency integrated nursing model for emergency trauma patients helps streamline the treatment process, enhance treatment effectiveness, and reduce the incidence of adverse events.

Keywords: Improved emergency integrated care; Emergency trauma; Treatment outcome; Safety

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1. Introduction

Emergency trauma is one of the emergencies handled by emergency surgery, referring to an urgent situation where external forces suddenly act on the human body, causing damage to tissue structure or function^[1]. The occurrence of trauma is related to various factors, mainly including car accidents, falls from heights, falls, fires, cutting injuries, and violent blows^[2]. After trauma, patients may experience symptoms such as pain, swelling, fractures, internal organ injuries, bleeding, dizziness, and in severe cases, breathing difficulties or even loss of life in a short

period of time^[3]. In emergency trauma care, timely and effective treatment and scientific and reasonable nursing have a decisive impact on ensuring patient safety and improving prognosis. The urgency of treatment time and the accuracy of diagnosis and treatment are particularly important, as any delay or operational error may lead to irreversible outcomes^[4]. In view of this, there is an urgent need for clinical exploration of an efficient emergency nursing model. Improved emergency integrated nursing is a patient-centered nursing model that enhances emergency treatment efficiency and reduces adverse events by optimizing the entire process of emergency reception, injury assessment, auxiliary examination, clinical diagnosis, targeted treatment, and strengthening team collaboration^[5,6]. This study will select 92 patients with emergency trauma in our hospital as the observation target to evaluate the impact of improved emergency integrated nursing on the treatment effect and safety of emergency trauma patients.

2. Materials and methods

2.1. General information

Study duration: From December 2024 to December 2025. Observation target: Emergency trauma patients in our hospital.

2.1.1. Sample size

92 cases. Using computer-based grouping method, the 92 patients were divided into two equally sized groups, with 46 patients in each group.

2.1.2. Control group

Included 24 male patients and 22 female patients, with ages ranging from 22 to 69 years, with a mean age of (43.65 ± 4.37) years.

2.1.3. Observation group

Included 25 male patients and 21 female patients, with ages ranging from 23 to 69 years, with a mean age of (44.27 ± 4.20) years.

2.1.4. Injury severity

29 patients with mild injuries, 57 patients with moderate injuries, and 6 patients with severe injuries.

2.1.5. Baseline data

Baseline data such as gender and age were balanced between the two groups, with $p > 0.05$, indicating that the data were comparable.

2.1.6. Inclusion criteria

- (1) All patients were emergency trauma patients.
- (2) Patients were conscious and able to cooperate with nursing care.
- (3) Clinical data were complete without any missing items.
- (4) No severe infectious diseases were present.

2.1.7. Exclusion criteria

- (1) Coagulopathy.
- (2) Cognitive abnormalities, disturbance of consciousness, and inability to cooperate with nursing procedures.
- (3) Congenital diseases.
- (4) Patients with extremely unstable vital signs and in a critical statement.

2.2. Method

2.2.1. Control group

Conduct routine emergency nursing care. Upon receiving the call for emergency assistance, medical personnel are dispatched immediately to the scene to provide basic treatment to the patient and transport them to the hospital. After the patient is admitted, the responsible nurse must assess the patient's condition and administer treatments such as intravenous infusion and hemostasis according to the doctor's orders. The patient's vital signs are closely monitored. Once the patient's condition stabilizes, the nurse assists in the next steps of treatment.

2.2.2. Observation group

Implement an improved emergency integrated care model.

- (1) Pre-hospital emergency care

Upon receiving a pre-hospital emergency call, the patient's condition assessment and location determination must be completed within 3 minutes, while simultaneously dispatching emergency vehicles and professional medical teams to the scene. Upon arrival, quickly assess the patient's condition, prioritize treatment for fatal injuries such as airway obstruction and massive hemorrhage, and immediately administer oxygen therapy (usually nasal catheter oxygen therapy, while face mask oxygen therapy is required for patients with severe traumatic shock). After the patient's vital signs stabilize, immediately escort the patient to the hospital. During the escort, use the 5G communication system to maintain contact with medical personnel in the hospital, informing emergency personnel of the patient's current condition and ensuring that the emergency team completes equipment preparation, surgical arrangements, and other receiving tasks in advance.

- (2) Establish an integrated care team

The team members include emergency department physicians, charge nurses, radiology department personnel, and operating room personnel, with each member's responsibilities defined. The charge nurse serves as the team coordinator, overseeing and connecting various aspects of the receiving process, including condition assessment and transfer, to ensure timely and accurate information transmission. In addition, regular training and practical drills should be conducted.

- (3) Improve the receiving assessment process

When a patient arrives at the emergency department, the charge nurse needs to quickly assess the extent of trauma, complete trauma classification (mild, moderate, severe) and fatal risk ranking within 5 minutes, prioritizing patients with severe trauma and life-threatening conditions. Simultaneously, the charge nurse must perform multiple tasks to shorten the emergency treatment time, including monitoring vital signs (such as heart rate and blood pressure), establishing venous catheterization and access, collecting blood samples, and assisting with breathing during the assessment phase, which can reduce waiting time in traditional step-by-step operations.

(4) Informationization of emergency trauma treatment

Utilize the hospital's emergency information system to enter patient personal information in real time, such as patient triage information (including trauma classification, cause of trauma, etc.), vital sign monitoring data (such as breathing and heart rate), examination results, and treatment methods, enabling team members to exchange information and obtain the latest diagnostic and treatment information. The charge nurse needs to pay attention to the examination process, and once the examination results are obtained, immediately provide the electronic medical record to the attending physician, which can shorten the time from examination completion to treatment plan determination.

(5) Optimize the treatment and transfer connection process

Based on the assessment results, the medical team develops a treatment plan, and the charge nurse needs to continuously monitor the patient's condition changes and promptly improve the nursing plan. For trauma patients with surgical indications, the responsible nurse should communicate with the operating room in advance and prepare for preoperative work. After waiting for the patient to complete examinations and confirming that the patient is suitable for surgery, the patient should be transferred to the operating room. During the transfer process, the patient should be observed constantly to ensure patient safety.

(6) Follow-up work for emergency treatment

After completing the rescue work, the responsible nurse needs to safely transfer the patient to a specialized ward and closely monitor their health status. Once abnormal conditions are detected, rapid assessment and appropriate treatment measures should be taken.

2.3. Observation indicators

(1) Indicators related to treatment

Evaluation is conducted from four aspects: pre-hospital emergency care time (the time from on-site emergency care to the patient's arrival at the emergency department), diagnosis time (the time from the patient's arrival at the emergency department to a confirmed diagnosis), emergency rescue time (the time for rescue and treatment within the emergency department), and examination waiting time (the time from completing the examination to obtaining the results).

(2) Treatment effect

Markedly effective successful treatment; effective: treatment is effective, but close observation of the patient's condition is required; ineffective: after treatment, the patient's vital signs remain unstable, or multiple treatments are required.

(3) Occurrence of adverse events

The survey indicators include transportation accidents, omissions in disease monitoring, infections, traumatic shock, and organ failure.

2.4. Statistical methods

Using SPSS 27.0 as the statistical analysis method, measurement data is represented as mean \pm standard deviation ($\bar{x} \pm s$), and the test form is represented as t . Enumeration data is represented as $n\%$, and the test form is represented as χ^2 . A test result of $p < 0.05$ indicates significant data differences and statistical significance.

3. Result

3.1. Comparison of treatment-related indicators between groups

After intervention, the pre-hospital emergency care time, emergency diagnosis time, total emergency rescue duration, and examination waiting time in the control group were all longer than those in the observation group, with $p < 0.05$. See **Table 1**.

Table 1. Comparison of the levels of treatment-related indicators between the two groups ($\bar{x} \pm s$)

Group	Countdown	Pre-hospital emergency care time, min	Emergency diagnosis time, min	Total duration of emergency rescue, min	Check waiting time, min
Control group	46	19.65 ± 2.16	11.67 ± 1.65	98.96 ± 5.33	3.01 ± 0.12
Observation group	46	14.42 ± 2.10	6.27 ± 1.64	79.80 ± 5.20	0.92 ± 0.08
<i>t</i>		8.651	8.064	13.067	11.679
<i>p</i>		0.001	0.001	0.001	0.001

3.2. Comparison of treatment effects between groups

After intervention, the treatment effect in the control group (effectiveness: 82.61%) was inferior to that in the observation group (effectiveness: 95.65%), with $p < 0.05$, as shown in **Table 2**.

Table 2. Comparison of treatment effects between the two groups (n%)

Group	Countdown	Efficacious	Effective	Invalid	Inefficiency
Control group	46	20 (43.48)	18 (39.13)	8 (17.39)	38 (82.61)
Observation group	46	25 (54.35)	19 (41.30)	2 (4.35)	44 (95.65)
χ^2					4.375
<i>p</i>					0.002

3.3. Comparison of adverse event occurrence between groups

After intervention, the incidence of adverse events was lower in the observation group compared to the control group, with $p < 0.05$. See **Table 3**.

Table 3. Comparison of adverse event occurrence rates between the two groups (n%)

Group	Countdown	Unexpected transfer	Omissions in disease monitoring	Infection	Traumatic shock	Organ failure	Incidence
Control group	46	1 (2.17)	1 (2.17)	2 (4.35)	2 (4.35)	1 (2.17)	7 (15.22)
Observation group	46	0 (0.00)	1 (2.17)	1 (2.17)	0 (0.00)	0 (0.00)	2 (4.35)
χ^2							4.364
<i>p</i>							0.003

4. Discussion and conclusion

Trauma is a disease resulting from the destruction of tissue structure due to external forces [7]. Common traumas

in the emergency department mainly include soft tissue injuries, joint fractures, abdominal trauma, and head trauma, among others^[8]. After trauma, patients require timely and effective diagnosis and treatment. Conventional emergency care faces issues such as fragmented processes, loose connections between various links, and poor information exchange, which prolong the time required to treat patients, increase the risk of disease deterioration, and are prone to adverse events^[9]. Integrated emergency care can provide patients with timely, efficient, and seamless emergency care services, enhancing treatment efficiency and improving patient prognosis^[10].

In improving emergency integrated care, regarding pre-hospital emergency care, timely assessment of patient status and clear identification of patient location, followed by arranging emergency personnel to the scene, enable rapid response. Upon arrival, patients with life-threatening conditions are prioritized for treatment, and after proper management, they are immediately escorted to the hospital. Real-time communication with the in-hospital emergency trauma treatment team during transportation ensures that emergency departments are prepared in advance, facilitating prompt patient assistance, significantly reducing pre-hospital emergency care time, and decreasing the probability of transfer accidents. The establishment of a dedicated team addresses the issue of poor collaboration among various departments in traditional care, promoting good cooperation among departments. The responsible nurse coordinates all aspects of work, reducing communication errors and improving the success rate of patient treatment. Through training and practical drills, team collaboration is strengthened, preventing omissions in condition monitoring, thereby improving emergency diagnosis and treatment processes. In terms of improving the admission assessment process, rapid completion of patient trauma assessment enhances the scientific effectiveness of triage decisions. Prioritizing patients with severe trauma can win valuable time for subsequent treatment. Simultaneously performing multiple tasks such as vital signs monitoring, venous catheterization, and assisted breathing can shorten the total duration of emergency rescue. In terms of emergency trauma treatment informatization, real-time entry of patient personal information into the emergency information system and sharing of diagnostic data help medical personnel obtain the latest examination results in a timely manner and quickly develop treatment plans, effectively reducing the time from examination to treatment method determination and improving treatment outcomes. In terms of improving the treatment and transfer connection process, responsible nursing ensures that patients are directly transferred to the next treatment step after completing examinations by closely monitoring patient condition changes and physical status, optimizing nursing measures, and communicating with the operating room in advance. This can timely restore tissue perfusion, reduce inflammatory response, and thereby decrease the occurrence of traumatic shock and organ failure. Subsequent emergency care can directly reduce the risk of adverse events such as infection. According to the results of this study, after intervention, the pre-hospital emergency care time, emergency diagnosis time, total emergency rescue duration, and examination waiting time in the control group were all longer than those in the observation group ($p < 0.05$); the treatment effectiveness (effectiveness: 82.61%) in the control group was worse than that in the observation group (effectiveness: 95.65%), $p < 0.05$; compared with the control group, the observation group had a lower incidence of adverse events (transfer accidents, omissions in condition monitoring, infection, traumatic shock, organ failure), $p < 0.05$, indicating that improving emergency integrated care intervention for emergency trauma patients not only enhances treatment effectiveness but also ensures patient safety.

In summary, implementing an improved emergency integrated nursing model for emergency trauma patients can help improve treatment efficiency, enhance treatment outcomes, and reduce the risk of adverse events.

Disclosure statement

The authors declare no conflict of interest.

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