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Research on Emergency Nursing Strategies for Patients with Acute Myocardial Infarction

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Abstract: *Background*: Acute myocardial infarction (AMI) demands timely and effective intervention to prevent severe complications and improve patient outcomes. However, differences in emergency nursing protocols can affect the success of treatment. Therefore, evaluating the effectiveness of an optimized comprehensive emergency nursing model, which includes advanced assessment methods and individualized care strategies, is crucial for enhancing treatment protocols. *Objective*: This study aimed to assess the impact of a comprehensive emergency nursing model on patients diagnosed with acute myocardial infarction (AMI) within the cardiology department, focusing on optimizing rescue efficiency and patient outcomes. *Methods*: This retrospective study analyzed data from 90 AMI patients admitted to the hospital between January and December 2024. The study was conducted within the cardiology department of our hospital. The patients were divided into two groups: an intervention group (n=45) and a control group (n=45). The intervention group received care under the comprehensive, optimized emergency nursing model, while the control group received standard emergency care. Evaluation parameters included rescue time, clinical outcomes, and patient satisfaction with nursing care. *Results*: No significant differences in baseline characteristics were found between the two groups. However, the intervention group (n=45) demonstrated significantly shorter rescue times compared to the control group (n=45) in all measured parameters, including triage assessment time (7.49 ± 1.29 vs. 12.49 ± 2.18 minutes) and total emergency time (28.37 ± 3.14 vs. 48.64 ± 5.65 minutes), with P-values < 0.001. Additionally, the intervention group showed significantly lower rates of clinical complications, including heart failure (4.44% vs. 17.78%) and recurrent myocardial infarction (2.22% vs. 17.78%), and higher patient satisfaction across all parameters, with P-values < 0.001. These findings demonstrate the effectiveness of the comprehensive emergency nursing model in enhancing AMI care. *Conclusion*: The comprehensive emergency nursing model significantly improved rescue efficiency, reduced complications, and increased patient satisfaction in AMI care, demonstrating its clinical effectiveness.

Keywords: Acute myocardial infarction (AMI); Emergency nursing; Rescue time; Rescue outcomes; Nursing satisfaction

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1. Introduction

Acute myocardial infarction (AMI) is a common form of acute coronary syndrome, occurring when the blood supply to the coronary artery is interrupted, leading to myocardial ischemia, hypoxia, and tissue necrosis [1–3]. AMI poses a severe threat to health, often resulting in heart failure, shock, and death if not treated promptly. According

to the World Health Organization (WHO), cardiovascular diseases are the leading cause of death globally, with AMI contributing significantly to mortality [4].

Emergency nursing plays a crucial role in AMI treatment, focusing on monitoring vital signs, managing symptoms like pain and anxiety, and early cardiac intervention [5–7]. Given AMI's rapid progression and the short treatment window, emergency nursing requires high timeliness and expertise. Effective interventions during early treatment can improve survival rates and reduce complications [8].

Emergency nursing strategies for AMI have evolved with advancements in medical technology and nursing practices. These strategies now include pharmacological treatments, surgical interventions, and comprehensive care such as psychological support, pain management, and patient education [9–10]. Key treatments like antiplatelet drugs, anticoagulants, thrombolysis, and coronary interventions are vital in emergency care.

Despite these advancements, challenges remain, including the high mortality rate and the need for nursing staff to quickly assess and adjust care based on the patient's condition. This study aims to explore emergency nursing strategies for AMI, evaluate their impact on patient outcomes, and provide scientific evidence for improving nursing practices to enhance survival and quality of life for AMI patients.

2. Methods

2.1. Study Design

A total of 90 AMI patients admitted to XX Hospital from January to December 2024 were selected for this study. The patients were arranged in the order of their enrollment and randomly assigned to either the experimental group or the control group, with 45 patients in each group. The control group consisted of 33 males and 12 females, with an age range of 51 to 94 years and a mean age of 73.2 ± 10.3 years. The experimental group consisted of 28 males and 17 females, with an age range of 51 to 94 years and a mean age of 73.5 ± 9.2 years.

2.2. Inclusion and exclusion criteria

2.2.1. Inclusion criteria

The inclusion criteria were as follows: (1) aged 18 years or older; (2) diagnosed with AMI according to the "Guidelines for Diagnosis and Treatment of Myocardial Infarction"; (3) received treatment within 24 hours of hospital admission.

2.2.2. Exclusion criteria

The exclusion criteria were as follows: (1) the presence of severe complications such as heart failure malignant arrhythmia; (2) severe hepatic or renal insufficiency or other significant organ failures; (3) severe mental illness impeding cooperation with treatment and research; (4) long-term bedridden state prior to the onset of acute my ocardialinfarction, rendering the individual unable to live independently; (5) participation in other clinical trials [11].

2.3. Standard emergency care protocol for the control group

2.3.1. Standard emergency care in the control group

The control group received standard emergency care, which was implemented as follows.

Emergency reception: Upon receiving emergency notifications, the nursing team promptly arrived at the scene. Their immediate priority was to stabilize the patients' vital signs, including administering oxygen and providing basic symptomatic treatments.

Real-time monitoring and assessment: Continuous vital sign monitoring was utilized to assess the severity of the patients' conditions in real time. This assessment guided subsequent emergency interventions.

Emergency readiness and transfer: Ongoing communication with the operating room was maintained to ensure preparedness for thrombolytic therapy or other necessary emergency interventions. Once the patients' conditions were stabilized, they were transferred to the appropriate treatment department without delay.

Coordination of follow-up procedures: After stabilization, the nursing team assisted the patients' families with hospital admission procedures. Additionally, the team communicated with the relevant department's nurses to facilitate patient transfer and ensured the establishment of a green channel for efficient patient reception.

2.3.2. Emergency nursing model in intervention group

The intervention group implemented an optimized emergency nursing model with the following components.

Optimized reception: The Critical Care Unit (CCU) team was pre-notified during the ambulance's en route, ensuring preparedness for a seamless patient reception [12].

Enhanced assessment: The attending nurse initiated bedside oxygenation and monitored ECG and blood oxygen saturation, obtaining detailed chest pain information and conducting a thorough evaluation.

Emergency procedure optimization: The physician, nurse, and CCU leader coordinated to establish intravenous access within 5 minutes, transfer the patient to the catheterization room via the green channel within 10 minutes, and monitor results within 30 minutes.

Improved handover: Continuous vital sign monitoring and comprehensive handover after surgery ensured proper documentation and continuity of care.

Nursing process optimization: A departmental management system was established, with nursing staff adhering to duties and regular assessments, ensuring continuous improvement in nursing processes [13].

2.4. Observational measures

This study employed various observational measures to assess the effectiveness of the comprehensive emergency nursing model for AMI patients [14]. Measures included:

Rescue time measurement: Time from admission to key interventions, evaluating emergency care efficiency.

Incidence of clinical complications: Documentation of complications such as angina, arrhythmia, and heart failure.

Patient satisfaction: Evaluated using a Likert scale to assess response time, staff attitudes, professionalism, and overall satisfaction.

2.5. Statistical analysis

Data analysis was conducted using SPSS version 22.0. The data were presented as mean ± standard deviation ($\bar{x} \pm s$) and subjected to *t*-tests. A *P*-value of < 0.05 was considered statistically significant.

3. Results

3.1. Comparison of rescue time between two groups of patients

The intervention group showed significantly shorter times in triage assessment, ECG completion, venous blood sampling, intravenous medication, and total emergency time compared to the control group, with statistically significant differences ($P < .001$), as depicted in **Table 1**.

Table 1. Comparison of rescue time between intervention and control groups (Mean ± s)

Grou	Triage assessment time (minutes)	ECG completion time (minutes)	Venous blood sampling time (minutes)	Intravenous medication time (minutes)	Total emergency time (minutes)
Intervention group (*n*=45)	7.49 ± 1.29	9.29 ± 1.46	6.52± 0.97	5.58± 1.19	28.37± 3.14
Control group (*n*=45)	12.49± 2.18	15.83± 2.89	10.77± 1.83	9.89± 1.79	48.64± 5.65
t	-13.24	-13.61	-13.44	-13.31	-21.03
P	<0.001	<0.001	<0.001	<0.001	<0.001

Note: Data presented as mean ± standard deviation (Mean ± s). Independent sample *t* tests were used to compare rescue times between groups. $P < .001$ indicates significant differences between groups in all measured rescue times

3.2. Comparison of the incidence rate of clinical complications between the two groups of patients

The intervention group exhibited significantly lower incidence rates of complications such as angina, arrhythmia, heart failure, shock, and recurrent myocardial infarction, with statistically significant differences ($P < .05$), as depicted in **Table 2**.

Table 2. Comparison of rescue outcomes between the two groups of patients [n (%)]

Group	Angina(%)	Arrhythmia (%)	Heart failure(%)	Shock (%)	Recurrent myocardial infarction (%)
Intervention group (n=45)	2 (4.44%)	3 (6.67%)	2 (4.44%)	0 (0.00%)	1 (2.22%)
Control group (*n*=45)	9 (20.00%)	10 (22.22%)	8(17.78%)	6(13.33%)	8 (17.78%)
x^2	5.074	4.406	4.05	6.428	5.948
P	0.024	0.036	0.044	0.011	0.015

Note: Data presented as numbers (percentages). Chi-square ($x2$) tests were performed to compare the occurrence rates of rescue outcomes between groups. Significant differences were found for angina, arrhythmia, heart failure, shock, and recurrent myocardial infarction, indicating lower occurrence rates in the intervention group compared to the control group

3.3. Comparison of patient satisfaction between the two groups of patients

The intervention group reported significantly higher scores in nursing response time, nursing attitude, professional competence, and overall satisfaction compared to the control group, with statistically significant differences ($P < .001$), as depicted in **Table 3**.

Table 3. Nursing satisfaction scores comparison between two patient groups (Mean ± s)

Group	Nursing	Response time	Nursing attitude	Professional competence	Overall satisfaction
Intervention group (*n*=45)	4.23 ± 0.69	4.58 ± 0.69	4.52 ± 0.49	4.64 ± 0.25	4.55± 0.39
Control group (*n*=45)	3.62 ± 0.66	3.67 ± 0.21	3.99 ± 0.52	3.52 ± 0.40	3.65 ± 0.42
t	13.77	8.66	15.63	51.15	30.93
P	<0.001	<0.001	<0.001	<0.001	<0.001

Note: The table presents the comparison of nursing satisfaction scores between the intervention and control groups. Scores are presented as mean ± standard deviation (Mean ± s). Statistically significant differences were observed in all parameters between the two groups ($P < .001$)

4. Discussion

Acute Myocardial Infarction (AMI) is a pathological condition characterized by the sudden interruption or reduction of blood supply to the myocardium, leading to ischemia, hypoxia, and ultimately myocardial tissue necrosis [15]. The pathological process begins when a rupture or erosion of an atherosclerotic plaque leads to the formation of a thrombus, which obstructs the coronary artery, depriving the heart muscle of oxygen and nutrients [16]. This interruption in blood flow initiates a cascade of biochemical events that result in myocardial injury and, if left untreated, may lead to irreversible tissue damage, heart failure, or death [17–18].

Standard nursing care for AMI primarily involves monitoring vital signs, administering medications such as antiplatelet agents, anticoagulants, and pain management, and ensuring the timely delivery of oxygen. While these measures are critical for stabilizing patients, they do not address the rapid progression of the disease or prevent further myocardial damage during the critical early phase of AMI. Therefore, the adoption of acute emergency nursing strategies is paramount [19]. These strategies focus on minimizing the time from symptom onset to intervention, such as early thrombolysis, percutaneous coronary intervention (PCI), or coronary artery bypass grafting (CABG). The acute care model emphasizes rapid assessment, immediate intervention, and continuous monitoring, which are essential for restoring coronary blood flow and limiting myocardial injury [20]. This proactive approach is crucial in improving survival rates, reducing complications, and enhancing recovery outcomes in AMI patients. Therefore, acute emergency nursing strategies play a vital role in optimizing patient care and preventing long-term adverse effects.

The intervention group showed significant improvements in key outcomes compared to the control group. Rescue times were notably shorter for triage assessment (7.49 ± 1.29 vs. 12.49 ± 2.18 minutes), ECG completion (9.29 ± 1.46 vs. 15.83 ± 2.89 minutes), and total emergency time (28.37 ± 3.14 vs. 48.64 ± 5.65 minutes), with all *P*-values < 0.001 (**Table 1**). The intervention group also had lower rates of clinical complications, including angina, arrhythmia, and heart failure, with *P*-values between 0.011 and 0.044 (**Table 2**). Patient satisfaction was higher in the intervention group for nursing response time and overall satisfaction, with all *P*-values < 0.001 (**Table 3**). These findings highlight the model's effectiveness in improving care.

The emergency nursing strategies for acute myocardial infarction (AMI) patients have a significant impact on clinical outcomes. Optimizing these strategies effectively shortens rescue times, reduces the occurrence of clinical complications, and enhances patient satisfaction. Through preemptive preparation and rapid response, the intervention group demonstrated significantly shorter times in key stages, such as triage assessment, ECG completion, and venous blood sampling, thus maximizing the restoration of cardiac blood flow and reducing myocardial necrosis. Additionally, optimized nursing processes effectively lowered the incidence of complications like angina, arrhythmia, and heart failure, improving overall treatment outcomes. Emergency nursing not only focuses on physiological treatments but also on psychological care and the enhancement of patient relationships, thereby increasing patient satisfaction. The multidisciplinary collaborative model further contributed to the improvement of emergency care efficiency. In summary, comprehensive emergency nursing strategies have significant clinical value in improving AMI patient outcomes, reducing complications, and increasing patient satisfaction.

5. Study limitations

It is essential to acknowledge the limitations of this study that may affect the generalizability of the findings. First, the study was conducted at a single hospital, limiting the diversity of the patient population and healthcare

environment. Therefore, the results may not be applicable to other regions or countries with different healthcare systems. Second, the study focused exclusively on AMI patients in the cardiology department, which may limit the applicability of the model to other emergency conditions. Lastly, the retrospective design of the study introduces potential biases, suggesting the need for future prospective studies with larger sample sizes.

6. Clinical implications

Optimized patient outcomes through efficient rescue time: The reduction in rescue time achieved by the comprehensive emergency nursing model directly improves AMI patient survival and prognosis. By streamlining critical procedures, such as triage assessment and thrombolytic therapy, the model enhances overall emergency care delivery. The multidisciplinary approach fosters better coordination and standardized procedures, improving patient safety. Moreover, lower incidences of complications, such as heart failure and recurrent infarction, underscore the model's effectiveness in enhancing patient outcomes. The model also improves healthcare efficiency, reducing waiting times and optimizing resource utilization within emergency settings.

7. Conclusion

In conclusion, the comprehensive emergency nursing model significantly improved rescue efficiency for AMI patients through streamlined processes and team collaboration, reducing clinical complications and enhancing patient satisfaction. These findings highlight the model's effectiveness in emergency care. However, limitations such as the small sample size and single-center design suggest the need for future research with larger, multicenter studies and randomized controlled trials to confirm the model's broader applicability and effectiveness.

Disclosure statement

The authors declare no conflict of interest.

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