ORIGINAL RESEARCH

Stratified Nursing Based on ICNSS Score: Study on the Impact of Complications and Rehabilitation Effects in Patients with Acute Myocardial Infarction Complicated by Heart Failure

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ABSTRACT

Objective • To analyze the application effects of stratified nursing based on the ICNSS score and its influence on complications and rehabilitation effects in patients with Acute Myocardial Infarction (AMI) complicated by Heart Failure (HF).

Methods • A retrospective analysis was conducted on clinical data of 97 patients with AMI complicated by HF admitted to Xingtai Central Hospital between January 2021 and January 2023. All patients met the inclusion and exclusion criteria. Patients were divided into a control group (n=47) and an observation group (n=50) based on different nursing interventions received. The control group received routine nursing interventions, while the observation group received stratified nursing interventions based on the ICNSS score. The comparison between the two groups involved Cardio Care Unit (CCU) treatment duration, psychological status Self-Rating Anxiety Scale (SAS), Self-Rating Depression Scale (SDS), cardiac function indicators Creatine Kinase (CK), Left Ventricular End-Diastolic Diameter (LVEDD), Left Ventricular Ejection Fraction (LVEF), Cardiac Output (CO), quality of life (SF-36), occurrence of nursing complications, and nursing satisfaction.

Results • 1. CCU treatment duration and psychological status: After treatment, the SAS and SDS scores and CCU treatment duration in the observation group were significantly lower than those in the control group ($P < .05$). 2. Cardiac function indicators: After treatment, the CK and LVEDD levels in the observation group were significantly higher than those in the control group, while LVEF and CO levels were significantly lower than those in the control group ($P < .05$). 3. Quality of life: After treatment, the physiological function, physical function, mental status, and social relationship scores in the observation group were significantly higher than those in the control group ($P < .05$). 4. Occurrence of nursing complications: The occurrence rate of nursing complications in the control group was 17.02%, while in the observation group, it was 2.00%, significantly lower than that in the control group ($P < .05$). 5. Nursing satisfaction: The nursing satisfaction in the control group was 78.72%, whereas in the observation group, it was 94.00%, significantly higher than that in the control group ($P < .05$).

Conclusion • Stratified nursing based on the ICNSS score demonstrates significant application effects in patients with AMI complicated by HF. Compared to routine nursing interventions, stratified nursing based on the ICNSS score further reduces CCU treatment duration, alleviates negative psychological emotions, improves cardiac function, and effectively controls and reduces the risk of complications. Moreover, this approach significantly enhances nursing satisfaction for both patients and their families, contributing significantly to promoting harmony in doctor-patient relationships, and deserves clinical promotion and application. (*Altern Ther Health Med.* [E-pub ahead of print.])

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INTRODUCTION

Acute Myocardial Infarction (AMI) complicated by concomitant Heart Failure (HF) represents a complex cardiovascular condition associated with amplified disease burden, heightened treatment complexity, and elevated risk of adverse events among affected patients.[1,2] Compared to AMI patients without HF, those with the dual diagnosis frequently exhibit more profound hemodynamic instability, heightened susceptibility to end-organ dysfunction, and propensity for psychological distress - factors that collectively mandate a heightened level of nursing vigilance and personalized interventions.[2,3]

In response to the unique care requirements of this high-acuity cardiac population, healthcare institutions have increasingly adopted stratified nursing models that allocate resources and tailor interventions according to individualized risk profiles. One such risk stratification tool, the Intercollegiate Cardiac Nursing and Stratified Care (ICNSS) score, categorizes patients into low, medium, or high-risk tiers based on a multidimensional assessment of hemodynamic status, end-organ perfusion, and anticipated complication risk.[4] By aligning nursing care plans to these acuity-based assignments, this model has demonstrated improvements in clinical outcomes and resource optimization across diverse cardiac patient cohorts.[5,6]

However, the application and impacts of ICNSS-guided stratified nursing have been inadequately investigated in the specific context of AMI complicated by HF. This patient subgroup represents a critical knowledge gap, as they often require complex, multidisciplinary care to mitigate their

heightened vulnerability to adverse events and suboptimal functional recovery. Elucidating the effects of this stratified nursing approach on complication rates, rehabilitation trajectories, and other key outcomes in AMI-HF patients is essential to develop more targeted and effective nursing strategies that can enhance both clinical and humanistic burden in this high-acuity cardiac population.

Therefore, this retrospective study aims to analyze the implementation and impacts of stratified nursing based on the ICNSS score in patients hospitalized with AMI-HF. Specifically, it will: Describe the workflow and specific nursing interventions associated with the ICNSS-guided stratified nursing model in the management of AMI-HF patients; Evaluate the effects of this stratified nursing approach on the incidence of major complications (e.g., cardiogenic shock, life-threatening arrhythmias, acute kidney injury); Assess the impact of stratified nursing on patients' rehabilitation outcomes, including functional status, exercise capacity, and health-related quality of life; and provide granular insights to guide future nursing practice, resource allocation, and clinical guideline development for this high-risk cardiac population.

MATERIALS AND METHODS

Study Population

A retrospective analysis was conducted on clinical data of 97 patients with AMI complicated by HF admitted to our hospital between January 2021 and January 2023. Inclusion criteria: 1. Patients diagnosed with AMI complicated by HF through relevant clinical examinations. 2. Patients with complete clinical data available for analysis. 3. Patients treated with thrombolysis or percutaneous coronary intervention who are admitted to the CCU. 4. Patients with at least one long-term caregiver. Exclusion criteria: 1. Patients with severe dysfunction in important organs. 2. Patients with abnormalities in the immune system, coagulation function, etc. 3. Patients with cognitive impairment, consciousness disorders, etc. 4. Patients and families with contraindications for the interventions adopted in this study. Patients were divided into a control group (n=47) and an observation group (n=50) based on different nursing interventions received. The control group received routine nursing interventions, while the observation group received stratified nursing interventions based on the ICNSS score.

In this single-blind study, the patients were unaware of which nursing intervention they were receiving - either the routine nursing intervention or the stratified nursing intervention based on the ICNSS score. However, the assessors who conducted the subjective measurements, such as the psychological assessments (Self-Rating Anxiety Scale and Self-Rating Depression Scale) and the nursing satisfaction surveys, were aware of the patients' group assignments.

By keeping the patients blinded to their group allocation, their responses to the psychological assessments and nursing satisfaction surveys were not influenced by their knowledge of the nursing intervention they were receiving. This has eliminated potential bias that could have arisen if the patients knew to which nursing approach they were subjected.

On the other hand, the assessors being aware of the patients' group assignments may have introduced some degree of bias in their evaluation and interpretation of the subjective outcome measures. The assessors' preconceptions or expectations about the different nursing interventions could have unconsciously influenced their assessment of the patient's psychological states and nursing satisfaction.

Methods

Control Group: Patients in the control group received routine nursing interventions based on the criteria related to AMI combined with HF,[8] including but not limited to basic care such as condition observation, assisting in examinations, etc. Patients were guided in medication usage according to medical advice, provided continuous oxygen therapy, and had intravenous access established. Nurses supervised patients' personal hygiene, regularly cleaned the ward, ensured proper ventilation, and maintained a comfortable treatment environment. Patients were advised to consume more vegetables and fruits, timely supplement nutrients for disease relief, and advised to schedule adequate rest to reduce cardiac stress. Patients were also encouraged to engage in moderate physical exercise to enhance their resistance. Additionally, targeted health education was provided to patients, addressing their queries patiently to establish a trusting and harmonious nurse-patient relationship.

Observation Group: Patients in the observation group received stratified nursing interventions based on the ICNSS score. Specific measures were as follows: (1) Stratification of nursing staff: Based on the positions of professional technical staff and combined with basic information of nursing personnel including but not limited to education, age, professional title, and work experience, nurses were divided into N1, N2, and N3 levels, where a higher level indicated stronger professional theoretical knowledge and operational skills. (2) ICNSS scoring: When evaluating patients' conditions, the nursing staff utilized the ICNSS scoring system 9, with scores ranging from 16 to 64. Under normal circumstances, patients scoring 16-22 were provided with Level 1 nursing by N1 nurses; patients scoring 23-32 were provided with Level 2 nursing by N2 nurses; and patients scoring above 32 were provided with Level 3 nursing by N3 nurses. (3) Nursing interventions: 1. Level 1 nursing: Maintaining patients' physiological functions to prevent health issues, including monitoring conditions, environmental care, psychological care, daily life care, complication care, infusion pump care, and maintaining pathways. Nurses should be familiar with instrument usage, autonomously conduct monitoring work, manage tracheal intubation, maintain monitoring equipment, rationally apply and manage ventilators, actively monitor hemodynamics, and ensure stability. 2. Level 2 nursing: Nurses appropriately utilized equipment and independently monitored patients, cooperated with attending physicians to execute effective

rescue methods. During nursing, they were familiar with temporary pacemaker placement-related nursing methods, maintained defibrillator equipment, focused on nursing work systems, strictly adhered to procedures for patient admission, transfer, external examinations, discharge, general treatment of deaths, and conducted demonstrations and relevant training in the nursing classroom. 3. Level 3 nursing: Generally, Level 3 patients have more severe conditions. Nurses proficiently handle specialized theoretical knowledge and operational skills, establish core job responsibilities and systems, identify problems during nursing and make improvements, independently conduct patient assessments, and detailed nursing record entries. Based on specialized nursing theory and operational skills, they participate in daily ward quality control, assist in some managerial work of the head nurse, supervise relevant examinations, and conduct nursing quality evaluations. (4) Active adjustment of nursing methods: Patient conditions typically change significantly during actual nursing work. The same nursing plan may yield different effects in various stages of treatment. Therefore, regular assessment of patients' ICNSS scores is necessary. Using actual assessment results as a basis, continuous adjustments to the nursing plan are made to implement targeted stratified nursing methods for patients.

Outcomes

Cardiac Care Unit (CCU) Treatment Duration: The CCU treatment duration refers to the total time a patient spends from admission to discharge from the CCU. Relevant medical staff in the hospital calculated the CCU treatment duration for all patients in this study.

Upon a patient's admission to the Cardiac Care Unit (CCU), the admitting nurse recorded the precise timestamp of the patient's arrival in the electronic medical record system. Similarly, when the patient was discharged from the CCU, the nurse responsible for the discharge process documented the exact timestamp of the patient's departure. The total elapsed time between the admission timestamp and the discharge timestamp was then automatically calculated by the hospital's information system. This CCU treatment duration, measured in hours and minutes, was systematically recorded in the patient's electronic chart. The process of recording admission and discharge times, as well as calculating the total CCU stay duration, was uniformly applied to every single patient included in the study sample. The hospital's clinical staff, including physicians, nurses, and other authorized personnel, were thoroughly trained on this standardized procedure to ensure the integrity and consistency of the CCU treatment duration data across all study participants.

Psychological State Level 10: Post-intervention, the level of anxiety was assessed using the Self-Rating Anxiety Scale (SAS) to evaluate the extent of patient anxiety. The SAS scale has a total score of 100 points, with a cutoff value of 50 points. A lower score indicates lower levels of anxiety. The level of depression was assessed using the Self-Rating Depression Scale (SDS), which also has a total score of 100 points with a cutoff value of 53 points. A lower score suggests lower inner feelings of depression in the patient.

Cardiac Function Indicators: Post-intervention, a 3 mL morning fasting venous blood sample was collected from patients, centrifuged routinely to obtain serum, and the levels of creatine kinase (CK) in the patient's body were measured. Additionally, an echocardiogram was used to measure the left ventricular end-diastolic diameter (LVEDD), left ventricular ejection fraction (LVEF), and cardiac output (CO).

The serum CK levels were measured using an Olympus AU5800 automated clinical chemistry analyzer. Blood samples were collected in serum separator tubes, centrifuged at 3,000 rpm for 10 minutes, and analyzed using an enzymatic colorimetric assay on the Olympus AU5800.

Echocardiographic measurements, including LVEDD, LVEF, and CO, were performed using a Philips iE33 echocardiography system. Transthoracic echocardiograms were conducted by certified cardiac sonographers following a standardized imaging protocol. LVEDD was measured from the parasternal long-axis view, LVEF was calculated using the modified Simpson's method, and CO was derived from the velocity-time integral and left ventricular outflow tract diameter. All cardiac function data, including the CK levels and echocardiographic parameters, were recorded in the patients' electronic medical records for subsequent analysis.

Quality of Life (SF-36) Level:[11] Post-intervention, the Short Form Health Survey (SF-36) was used to evaluate the patients' quality of life. Scores for each dimension range from 0 to 100, where higher scores indicate better quality of life.

The SF-36 consists of 36 questions that assess 8 health domains:

1. Physical Functioning (PF) - Evaluates limitations in physical activities due to health problems.
2. Role-Physical (RP) - Assesses limitations in usual activities and work due to physical health problems.
3. Bodily Pain (BP) - Measures limitations due to pain.
4. General Health (GH) - Evaluates overall health.
5. Vitality (VT) - Assesses energy and fatigue.
6. Social Functioning (SF) - Measures limitations in social activities due to physical or emotional problems.
7. Role-Emotional (RE) - Evaluates limitations in usual activities and work due to emotional problems.
8. Emotional Well-being (EW) - Assesses mood and emotions.

Each domain is scored from 0 to 100, with higher scores indicating better health status. The 8 domain scores can also be aggregated into two summary scores:

- Physical Component Summary (PCS)
- Mental Component Summary (MCS)

Incidence of Nursing Complications: The nursing complications observed in this study include pressure injuries, ventilator-associated pneumonia, catheter-related infections, and accidental extubation, among others. The

occurrence of these nursing complications was uniformly recorded by relevant medical staff in the hospital.

The researchers closely monitored and recorded the occurrence of various nursing complications that arose during the patient's care. These included:

Pressure injuries: Also known as bedsores, these are localized injuries to the skin and/or underlying tissues caused by prolonged pressure.

Ventilator-associated pneumonia: Pneumonia that develops in patients who are on mechanical ventilation.

Catheter-related infections: Infections associated with the use of intravenous catheters or urinary catheters.

Accidental extubation: Unplanned removal of a patient's endotracheal tube or tracheostomy tube.

The medical staff in the hospital followed a standardized protocol to consistently identify, document, and report these nursing complications across all the patients in the study. The protocol included clear definitions and diagnostic criteria for each type of complication, such as pressure injuries, ventilator-associated pneumonia, catheter-related infections, and accidental extubation. It outlined structured monitoring and assessment methods, including regular skin inspections, vital sign tracking, and catheter surveillance. Detailed documentation templates were used to capture key data points for each identified complication, which were centrally tracked and reported. Additionally, the protocol mandated staff training to ensure inter-rater reliability in complication assessment and diagnosis. Periodic audits and root cause analyses were conducted to maintain data accuracy and identify areas for improvement. This standardized approach allowed the researchers to reliably collect complication incidence data and have confidence in the validity of the findings across the patient population.

Nursing Satisfaction: Patients and their families were given a self-designed "Satisfaction Survey" by our hospital to rate their satisfaction regarding treatment and nursing interventions. The questionnaire consists of 20 questions, each scored on a scale of 5 points, with a total score of <70 indicating dissatisfaction, 70-89 indicating satisfaction, and ≥ 90 indicating very high satisfaction.

This survey consisted of 20 questions, with each question scored on a 5-point scale:

- 1 point = Very Dissatisfied
- 2 points = Dissatisfied
- 3 points = Neutral
- 4 points = Satisfied
- 5 points = Very Satisfied

The total score on the 20-question survey was then classified into three categories:

- Total score < 70: Dissatisfied with the nursing care and treatment
- Total score 70-89: Satisfied with the nursing care and treatment
- Total score ≥ 90: Very highly satisfied with the nursing care and treatment

Statistical Analysis

GraphPad Prism version 8 was used for graphical representation, while SPSS 22.0 was utilized for data analysis. Descriptive statistics such as mean and standard deviation were used to describe the distribution of quantitative data. Statistical analysis methods including *t* tests or analysis of variance (ANOVA) were applied. For categorical data, frequency and percentages were used to describe the distribution, and statistical analysis was conducted using chi-square tests or Fisher's exact tests. Differences were considered statistically significant at $P < .05$.

RESULTS

Comparison of Baseline Data

The baseline data of the two groups of patients were comparable, showing no significant differences in comparison ($P > .05$). Refer to Table 1 for details.

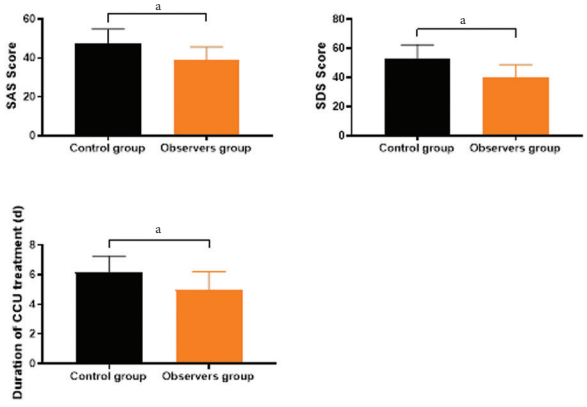
Comparison of CCU Treatment Time and Psychological Conditions

As shown in Figure 1, after treatment, the SAS scores and SDS scores for the control group were (47.19±7.56, 52.67±9.54) respectively, with a CCU treatment time of (6.15±1.09). The observation group, after treatment, had SAS scores and SDS scores of (38.76±6.89, 40.19±8.47) respectively, with a CCU treatment time of (4.97±1.23). Following treatment, the SAS scores, SDS scores, and CCU treatment time in the observation group were significantly lower than those in the control group ($P < .05$).

Table 1. Comparison of Baseline Data

	Control (n=47)	Observation (n=50)	t/χ^2	*P* value
Gender			0.004	.945
Male	21	22		
Female	26	28		
Age (years)	63.87±5.42	64.09±5.26	0.202	.839
BMI (kg/m^2)	23.62±1.15	23.47±1.21	0.625	.533
Killip Classification			0.182	.669
II	16	15		
III	31	35		
Treatment Method			0.034	.852
Thrombolysis	17	19		
Intervention	30	31		

Figure 1. Comparison of CCU Treatment Time and Psychological Conditions



[a]denotes intergroup comparison with $P < .05$.

Comparison of Cardiac Function Index Levels

As illustrated in Figure 2, post-treatment, the control group had CK, LVEDD, LVEF, and CO values of (149.65±15.38, 51.42±4.89, 49.18±5.74, 5.73±0.82) respectively, while the observation group had CK, LVEDD, LVEF, and CO values of (161.37±15.29, 54.67±5.43, 45.63±5.21, 4.67±1.02) respectively. Following treatment, the observation group exhibited significantly higher CK and LVEDD levels and notably lower LVEF and CO levels compared to the control group ($P < .05$).

Comparison of Quality of Life Levels

As depicted in Figure 3, after treatment, the control group scored (48.94±3.67, 52.39±4.65, 51.28±5.39, 49.03±6.25) for physical function, bodily pain, mental health, and social functioning respectively. In contrast, the observation group scored (69.76±4.13, 65.57±3.84, 62.43±3.64, 60.19±4.76) for the same categories. Following treatment, the observation group exhibited significantly higher scores in physical function, bodily pain, mental health, and social functioning compared to the control group ($P < .05$).

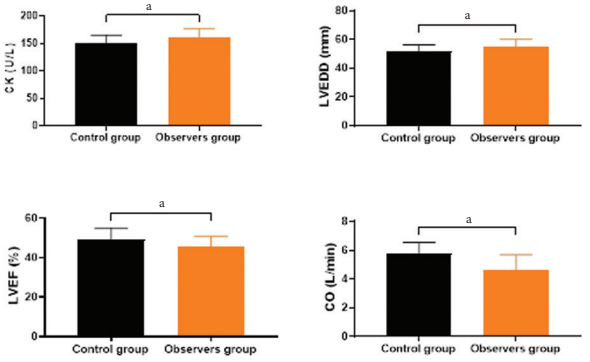
Comparison of Nursing Complication Incidence

The incidence of nursing complications was 17.02% in the control group and 2.00% in the observation group. The incidence of nursing complications was significantly lower in the observation group than in the control group ($P < .05$). See detailed data in Table 2.

Comparison of Nursing Satisfaction

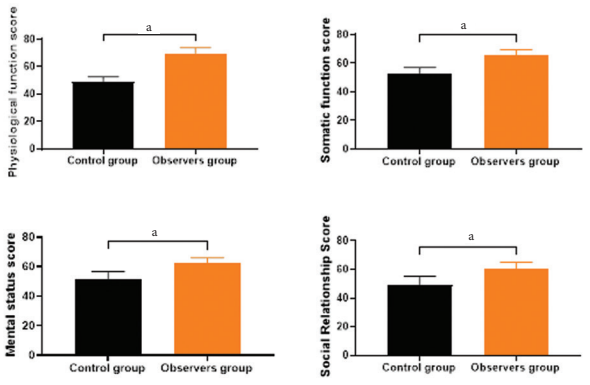
The nursing satisfaction was 78.72% in the control group and 94.00% in the observation group. The nursing satisfaction in the observation group was significantly higher than that in the control group ($P < .05$). See detailed data in Table 3.

Figure 2. Comparison of Cardiac Function Index Levels



[a]denotes intergroup comparison with $P < .05$.

Figure 3. Comparison of Quality of Life Levels



[a]denotes intergroup comparison with $P < .05$.

Table 2. Comparison of Nursing Complication Incidence

Nursing Complications	Control (n=47)	Observation (n=50)	χ^2	*P* value
Pressure injury	2	0	-	-
Ventilator-associated pneumonia	1	0	-	-
Catheter-related infection	3	1	-	-
Accidental extubation	2	0	-	-
Total Incidence Rate (%)	17.02%	2.00%	4.832	.027

Table 3. Comparison of Nursing Satisfaction

Group	n	Not Satisfied	Satisfied	Very Satisfied	Total Satisfaction Rate (%)
Control	47	10	23	14	78.72%
Observation	50	3	26	21	94.00%
χ^2	-	-	-	-	4.871
P value	-	-	-	-	.027

DISCUSSION

Cardiovascular diseases remain a major global health challenge, with acute myocardial infarction (AMI) being one of the most common and lethal types, and its occurrence in combination with heart failure (HF) is increasing annually.[12] Patients with AMI complicated by HF often have more severe conditions, greater treatment challenges, and are prone to complications, including but not limited to cardiogenic shock, arrhythmias, and multi-organ dysfunction.[13] Additionally, patients frequently experience negative psychological emotions such as anxiety and depression during the disease process, which collectively impact their recovery and quality of life.[14] Under traditional nursing models, such patients are often subjected to generalized treatment and care plans, lacking personalized and differentiated attention.[15] With the continuous advancement of medical technology and nursing philosophies, stratified care, as a nursing model addressing individualized patient needs, has gained increasing attention.[16] The ICNSS score, as an important tool for assessing the condition and risks of patients with AMI complicated by HF, offers a more comprehensive and systematic means of patient evaluation.[17] The concept of stratified nursing based on the ICNSS score has evolved from this, aiming to categorize patients into different tiers according to their condition scores and provide tailored nursing interventions and management for each tier of patients.[18]

However, there is still relatively limited clinical research on stratified nursing interventions based on the ICNSS score among patients with AMI complicated by HF. This study aimed to comprehensively explore the practical application and impact on patient recovery of this nursing model through a retrospective analysis of clinical data. The results of this study revealed that the incidence of nursing-related complications was 17.02% in the control group and 2.00% in the observation group, demonstrating a significantly lower

occurrence rate of nursing-related complications in the observation group compared to the control group ($P < .05$). These findings align with previous related studies,[19,20] confirming that stratified nursing based on the ICNSS score effectively reduces the risk of nursing-related complications in patients with AMI complicated by HF. The rationale lies in the objective assessment of patient conditions through the ICNSS score-based stratified nursing intervention, which anticipates and mitigates complications, consequently aiding the patients' physical recovery. Regarding the rehabilitation outcomes, the results of this study indicated that after treatment, the SAS and SDS scores, as well as CCU treatment duration, were significantly lower in the observation group compared to the control group ($P < .05$). The observation group exhibited significantly higher levels of CK and LVEDD but lower levels of LVEF and CO compared to the control group ($P < .05$). Furthermore, the observation group showed significantly higher scores in physical function, bodily pain, mental health, and social functioning compared to the control group ($P < .05$). These research outcomes substantiate that the application of ICNSS score-based stratified nursing significantly promotes the physical recovery of patients with AMI complicated by HF. The rationale lies in the comprehensive and meticulous nursing approach tailored to specific patient conditions and actual needs. In nursing practice, it helps establish reasonable daily routines for patients, preventing mental agitation and deterioration of their condition. During nursing, caregivers guide patients to maintain a calm and stable mental state, effectively reducing cardiac stress and the risk of heart failure recurrence. Additionally, ICNSS score-based stratified nursing interventions provide standardized and high-quality medical assistance and guidance, encouraging patients to face the disease positively, thereby maximizing treatment effectiveness and cure rates. Moreover, caregivers offer psychological support, social guidance, and disease counseling to prevent exacerbation, effectively alleviating patients' physical and psychological burdens and further enhancing the efficiency of nursing care. Finally, the study also compared the nursing satisfaction of the two groups of patients. The results revealed a nursing satisfaction rate of 78.72% in the control group and 94.00% in the observation group, indicating a significantly higher nursing satisfaction rate in the observation group compared to the control group ($P <0 .05$). These findings suggest that ICNSS score-based stratified nursing interventions can to some extent enhance the satisfaction of patients and their families, significantly contributing to the promotion of harmonious doctor-patient relationships. The reason behind this is the use of the ICNSS scoring system in nursing care, which aligns with the personalized care approach. Patients and their families can clearly understand their conditions through the ICNSS score, thereby reducing the previous sense of confusion and helplessness, ultimately contributing to improved nursing satisfaction.

The key mechanisms underlying the potential benefits of ICNSS-guided stratified nursing in patients with Acute Myocardial Infarction (AMI) complicated by Heart Failure (HF):

1. Early Identification of High-Risk Patients:
   - The ICNSS risk assessment tool enables nurses to accurately identify AMI-HF patients who are at elevated risk of developing life-threatening complications, such as cardiogenic shock, malignant arrhythmias, and acute kidney injury.
   - This risk stratification allows nurses to proactively allocate increased monitoring, personalized interventions, and enhanced resources to high-risk patients rather than a one-size-fits-all approach.
2. Targeted Nursing Interventions and Optimization of Care:
   - For high-risk patients, nurses can implement more frequent hemodynamic monitoring, titrate fluid administration, and diuretic therapy more precisely, and rapidly initiate appropriate interventions (e.g., vasopressors, antiarrhythmic medications) to stabilize the patient's condition and prevent clinical deterioration.
   - The stratified nursing model facilitates seamless collaboration between nurses, cardiologists, intensivists, and other specialists, enabling a rapid, coordinated, and multidisciplinary response to acute complications.
   - Nurses can closely monitor high-risk patients during rehabilitation activities, promptly identifying and managing any exercise-induced symptoms or signs of decompensation, thereby facilitating safe and effective rehabilitation.
3. Personalized Rehabilitation and Self-Management Support:
   - Rehabilitation programs and physical therapy can be tailored to the individual's functional status and exercise capacity, based on their risk tier, ensuring appropriate intensity and progression.
   - High-risk patients receive more comprehensive education on the importance of rehabilitation, as well as personalized coaching and goal-setting to maximize their engagement and adherence to the rehabilitation regimen.
   - Nurses can provide in-depth education to high-risk patients on symptom management, coping strategies, and lifestyle modifications, empowering them to actively participate in their own care and improve their sense of control and self-efficacy.
4. Improved Care Coordination and Transitional Care:
   - The stratified nursing model facilitates a smoother transition from the hospital to the community setting. Nurses provide personalized discharge planning, follow-up, and care coordination to support the patient's long-term recovery and health-related quality of life.
   - Improved communication and collaboration between hospital-based nurses and community-based healthcare providers can ensure continuity of care and address the evolving needs of high-risk AMI-HF patients during their recovery journey.

CONCLUSION

The application of stratified nursing intervention based on the ICNSS score among patients with AMI complicated by HF shows significant effectiveness. Compared to conventional nursing interventions, ICNSS score-based stratified nursing further reduces patients' CCU treatment duration, alleviates negative psychological states, improves cardiac function, and effectively controls and diminishes the risk of complications. Moreover, this nursing intervention, based on the ICNSS score, also enhances the nursing satisfaction of patients and their families to a certain extent, signifying its substantial significance in fostering harmonious doctor-patient relationships. Its clinical application and dissemination are thus warranted. However, it's important to note the limitations of this study despite its positive findings regarding the application of ICNSS score-based stratified nursing in influencing complications and recovery outcomes among patients with AMI complicated by HF. These limitations include 1. Sample Size and Single-Center Study: The study's relatively small sample size and single-center approach might limit the generalizability of the results. 2. Retrospective Design: Employing a retrospective design might restrict data completeness and accuracy, possibly missing crucial information and carrying the risk of information bias. 3. Unconsidered Potential Influential Factors: The study might overlook other potential influential factors such as patients' past lifestyles, dietary habits, and severity of complications, which could impact the research outcomes. 4. Clinical Significance and Long-term Effects: Although the study demonstrates better biochemical indicators and recovery in the observation group post-intervention, the substantive impact on long-term recovery and survival rates remains unclear. Considering these factors, future research should aim to address these limitations, providing more accurate and comprehensive information to guide clinical practice and offer improved medical care for patients with AMI complicated by HF.

REFERENCES

1. Del Buono MG, Moroni F, Montone RA, Azzalini L, Sanna T, Abbate A. Ischemic Cardiomyopathy and Heart Failure After Acute Myocardial Infarction. *Curr Cardiol Rep*. 2022;24(10):1505-1515. doi:10.1007/s11886-022-01766-6
2. Bahit MC, Kochar A, Granger CB. Post-Myocardial Infarction Heart Failure. *JACC Heart Fail*. 2018;6(3):179-186. doi:10.1016/j.jchf.2017.09.015
3. Palylyk-Colwell E, Wright MD. *Tiered Care for Chronic Non-Malignant Pain: A Review of Clinical Effectiveness, Cost-Effectiveness, and Guidelines*. Canadian Agency for Drugs and Technologies in Health; 2019. Accessed May 25, 2024. https://pubmed.ncbi.nlm.nih.gov/31291071/
4. Jie X, Weiquan L, Minghao F, Sufang H, Hui W, Xiuyun L. Application value of ICU nursing scoring system in nurse allocation. *Minerva Med*. 2013;104(3):325-332. Accessed May 25, 2024. https://pubmed.ncbi.nlm.nih.gov/23748286/
5. Shaw DS, Mendelsohn AL, Morris PA. Reducing Poverty-Related Disparities in Child Development and School Readiness: The Smart Beginnings Tiered Prevention Strategy that Combines Pediatric Primary Care with Home Visiting. *Clin Child Fam Psychol Rev*. 2021;24(4):669-683. doi:10.1007/s10567-021-00366-0
6. Shokr H, Rishworth A, Wilson K. Access to emergency care in Egypt: tiered health care and manifestations of inequity. *Soc Sci Med*. 2023;336:116212-116212. doi:10.1016/j.socscimed.2023.116212
7. Coonrod RA, Kelly BF, Ellert W, Loeliger SF, Rodney WM, Deutchman M. Tiered maternity care training in family medicine. *Fam Med*. 2011;43(9):631-637. Accessed May 25, 2024. https://pubmed.ncbi.nlm.nih.gov/22002774/
8. Baran DA, Grines CL, Bailey S, et al. SCAI clinical expert consensus statement on the classification of cardiogenic shock: This document was endorsed by the American College of Cardiology (ACC), the American Heart Association (AHA), the Society of Critical Care Medicine (SCCM), and the Society of Thoracic Surgeons (STS) in April 2019. *Catheter Cardiovasc Interv*. 2019;94(1):29-37. doi:10.1002/ccd.28329
9. Pyykkö AK, Laurila J, Ala-Kokko TI, Hentinen M. Intensive Care Nursing Scoring System Part 2: nursing interventions and nursing outcomes. *Intensive Crit Care Nurs*. 2001;17(1):16-27. doi:10.1054/iccn.2000.1540
10. Dunstan DA, Scott N, Todd AK. Screening for anxiety and depression: reassessing the utility of the Zung scales. *BMC Psychiatry*. 2017;17(1):329. doi:10.1186/s12888-017-1489-6
11. Lins L, Carvalho FM. SF-36 total score as a single measure of health-related quality of life: scoping review. *SAGE Open Med*. 2016;4:2050312116671725. doi:10.1177/2050312116671725
12. Wang XY, Zhang F, Zhang C, Zheng LR, Yang J. The Biomarkers for Acute Myocardial Infarction and Heart Failure. *BioMed Res Int*. 2020;2020:2018035. doi:10.1155/2020/2018035
13. Davis WT, Montrief T, Koyfman A, Long B. Dysrhythmias and heart failure complicating acute myocardial infarction: an emergency medicine review. *Am J Emerg Med*. 2019;37(8):1554-1561. doi:10.1016/j.ajem.2019.04.047
14. Mir T, Uddin M, Qureshi W, et al. Acute myocardial infarction and acute heart failure among renal transplant recipients: a national readmissions database study. *J Nephrol*. 2022;35(7):1851-1862. doi:10.1007/s40620-022-01252-w
15. Zhou Y, Wang X, Lan S, Zhang L, Niu G, Zhang G. Application of evidence-based nursing in patients with acute myocardial infarction complicated with heart failure. *Am J Transl Res*. 2021;13(5):5641-5646. Accessed May 25, 2024. https://pubmed.ncbi.nlm.nih.gov/34150170/
16. Sabella J, Kroon Van Diest AM, Bali N, et al. Multidisciplinary Tiered Care Is Effective for Children and Adolescents With Rumination Syndrome. *J Pediatr Gastroenterol Nutr*. 2023;76(3):282-287. doi:10.1097/MPG.0000000000003637
17. Pyykkö AK, Ala-Kokko TI, Laurila JJ, Miettunen J, Finnberg M, Hentinen M. Validation of the new Intensive Care Nursing Scoring System (ICNSS). *Intensive Care Med*. 2004;30(2):254-259. doi:10.1007/s00134-003-2040-4
18. Walker FA, Ball M, Cleary S, Pisani H. Transparent teamwork: the practice of supervision and delegation within the multi-tiered nursing team. *Nurs Inq*. 2021;28(4):e12413. doi:10.1111/nin.12413
19. Wang R, Duan G, Xu H, et al. Analysis on the Effect of the Rehabilitation Intervention-Centered Targeted Nursing Model on the Cardiac Function Recovery and Negative Emotions in Patients with Acute Myocardial Infarction. M.A B, ed. *Journal of Healthcare Engineering*. 2022;2022:1-6. doi:10.1155/2022/1246092
20. Wang ZR, Zhou JW, Liu XP, Cai GJ, Zhang QH, Mao JF. Effects of WeChat platform-based health management on health and self-management effectiveness of patients with severe chronic heart failure. *World J Clin Cases*. 2021;9(34):10576-10584. doi:10.12998/wjcc.v9.i34.10576