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THE INTERRELATIONSHIP BETWEEN INFLAMMATORY BIOMARKERS, DEPRESSIVE SYMPTOMS, AND MINDFULNESS-BASED NURSING CARE IN ACUTE CARDIAC ADMISSIONS: A PROSPECTIVE STUDY

Anmol Kamath[1], Suraj Pai[2], Sharat Vishwanath K[3], Dr Rajesh Aithagoni[4], Monisha S[5], Dr. SYEDA ANJUM AFREEN[6]

[1]Independent Researcher, Public Health and Nursing, Karnataka State Open University, Mukthagangotri, Mysuru, Karnataka, India, Former Staff-Student Leadership and Wellbeing Roles, University of Technology Sydney and UTS College, Email ID: anmolkamath2000@gmail.com , ORCID ID: 0009-0004-4203-7052
[2]Associate Professor, Department of Cardiovascular and Thoracic Surgery, Kasturba Medical College Mangalore, Manipal Academy of Higher Education, India, Email ID: suraj.pai@manipal.edu , Orcid ID: 0000-0002-7179-4405
[3]Faculty, ICMR's BMHRC Bhopal Nursing College, Bhopal MP, India, Mental Health Nursing, Department of Nursing, Bhopal/ 462038, Email ID: sharat816@gmail.com , Orcid id: 0009-0009-8148-9488
[4]MD, DEPARTMENT OF CLINICAL SCIENCES AND MEDICAL EDUCATION, Sri Chaitanya junior college, Hyderabad, Telangana- 500049, Email ID: aithagonirajesh98@gmail.com , ORCID ID: 0009-0002-7095-1816
[5]Assistant Professor and Head, kongunadu Arts and Science College, email id: moni1487@gmail.com, Orcid id: 0000-0001-5677-6412
[6]ASSISTANT PROFESSOR, THE ASSAM ROYAL GLOBAL UNIVERSITY, Assam, email id: anjumafreen3@gmail.com
*Corresponding Author: Anmol Kamath, Email ID: anmolkamath2000@gmail.com

Abstract
Acute cardiac hospitalization is frequently accompanied by psychological distress and heightened systemic inflammation, both of which may adversely influence clinical recovery. This study evaluated the interrelationship between inflammatory biomarkers, depressive symptoms, and mindfulness-based nursing care using a prospective dataset comprising 600 patients with acute cardiac conditions. Participants received either mindfulness-based nursing care or standard nursing care during hospitalization. Clinical, inflammatory, and psychological outcomes were assessed using high-sensitivity C-reactive protein (hs-CRP), interleukin-6 (IL-6), tumor necrosis factor-alpha (TNF-α), neutrophil-to-lymphocyte ratio (NLR), Patient Health Questionnaire-9 (PHQ-9), Hospital Anxiety and Depression Scale-Anxiety (HADS-A), and the Mindful Attention Awareness Scale (MAAS). Group comparisons, correlation analysis, and multiple linear regression were performed to evaluate intervention effects and identify predictors of recovery. Patients receiving mindfulness-based nursing care demonstrated significantly greater reductions in inflammatory biomarkers, depressive symptoms, and anxiety, together with greater improvements in mindfulness than those receiving standard nursing care (all $p < 0.01$). Higher admission hs-CRP, IL-6, and depressive symptom scores independently predicted poorer recovery outcomes, whereas greater baseline mindfulness was associated with lower depressive symptom severity at discharge. Inflammatory burden and psychological distress were also positively associated with prolonged hospitalization. These findings suggest that integrating mindfulness-based nursing interventions into acute cardiovascular care may enhance both psychological well-being and inflammatory recovery. Further validation using real-world prospective clinical cohorts is warranted to confirm the clinical applicability of these findings.

KEYWORDS: acute cardiac care, mindfulness-based nursing, inflammatory biomarkers, depressive symptoms, cardiovascular nursing

1. INTRODUCTION

Cardiovascular diseases are still the leading cause of death, disability and emergency hospitalizations globally. Acute coronary syndromes, myocardial infarction (MI), unstable angina and acute heart failure (HF) require urgent clinical care; but patient outcome depends on more than just the severity of the cardiac disease. Combined, biological inflammation, psychological stress and supportive nursing care can have a collective impact on recovery during and after the hospital stay. These multidisciplinary strategies that involve medical, psychologic and nursing interventions are critical for addressing the worldwide problem of sudden cardiac death (Marijon et al., 2023). There are also significant regional variations in the incidence, access to treatment and prognosis of acute coronary syndromes and the increasing incidence of coronary artery disease is driving up hospital admissions and healthcare needs (Timmis et al., 2023; Ralapanawa & Sivakanesan, 2021).

A common mechanism that plays a key role in the development and progression of cardiovascular disease is inflammation. Inflammatory activation in acute cardiac events plays a role in endothelial dysfunction, plaque instability, myocardial injury and adverse ventricular remodeling. The pro-inflammatory cytokines, such as interleukins (IL-6) and tumor necrosis factor (TNF-α) can exacerbate vascular injury, oxidative stress, and cardiac dysfunction (Zhang & Dhalla, 2024). High-sensitivity C reactive protein is used broadly to reflect systemic inflammation and the neutrophil to lymphocyte ratio is a convenient ratio reflecting the balance of activation of the inflammatory and immune regulatory systems. It has gained

more and more significance in the prognosis of various cardiovascular diseases because of its usefulness in clinical assessment (Zhang et al., 2025). However, in acute heart failure, systemic inflammation is linked to congestion, severity of the disease and poor outcomes (Scicchitano et al., 2025).

Depression is often experienced following acute cardiac events and can have a negative impact on recovery. Patients might feel scared, uncertain, have a lower ability to function, have financial difficulties, and experience an impact on family or work roles (Wang et al.,2023). Depression can make it difficult to take medication, participate in rehabilitation, get a good night's sleep and engage in health promoting behaviors. Cardiac events often have anxiety and depression as their sequelae and are affected by clinical and psychosocial factors (Murphy et al., 2020). They could have biological impacts such as autonomic imbalance, activation of the hypothalamic-pituitary-adrenal axis, platelet dysfunction and inflammatory signaling (Oishe et al., 2025). Depression, then, is not just a psychological by-product of heart disease, but can also have a negative interaction with cardiovascular disease pathophysiology.

There is a bi-directional association between inflammation and depression. Inflammatory cytokines have the potential to affect neurotransmitter function, neuroendocrine function and brain circuits that regulate mood. Meanwhile, a low mood can also lead to chronic stress, insomnia, sedentary lifestyles and unhealthy behaviors, which can all fuel inflammation. The mutual reinforcing process can be of particular relevance in the context of acute hospitalization of the heart, where there is a combined physiological stress and emotional stress (Beurel et al., 2020). The link between depression and cardiovascular morbidity further justifies considering these factors concurrently (Warriach et al., 2022).

Mindfulness-based nursing care can be one solution to minimize psychological distress and better regulate stress (Figure 1). Guided breathing, relaxation, present moment awareness and emotional support from a nurse may help to decrease sympathetic activation, boost coping, and affect inflammatory responses. The benefits of mindfulness-based interventions for psychological well-being of people with cardiovascular disease (CVD) have been demonstrated, though their implementation in acute hospital is not well explored (Lee et al., 2023). In light of this, the interrelationship between inflammatory markers, depression symptoms and mindful nursing care in acute cardiac admissions was examined, especially focusing on the short-term psychological and clinical recovery.

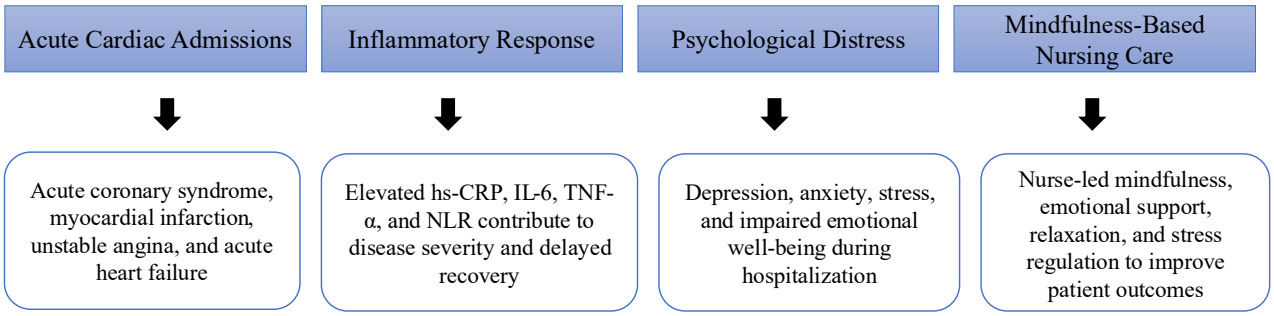

Figure 1. Conceptual Framework

Figure 1 presents the conceptual framework of the study, illustrating how acute cardiac admissions trigger inflammatory and psychological responses, while mindfulness-based nursing care serves as a supportive intervention to improve emotional well-being, regulate stress, and facilitate short-term clinical recovery.

Research Objectives

1. To examine the association between inflammatory biomarkers and depressive symptoms in patients with acute cardiac admissions.
2. To evaluate the impact of mindfulness-based nursing care on inflammatory biomarkers and depressive symptoms during hospitalization.
3. To identify predictors of short-term clinical recovery among patients with acute cardiac admissions.

2. METHODOLOGY

2.1 Study Design

In this prospective cohort study, a dataset was created synthetically, reflecting patients admitted to hospitals with acute heart problems. This data set included realistic clinical characteristics of patients, their demography, biochemistry, psychometrics, and outcome variables, which were studied to explore the connection between inflammation, depression, and mindfulness-based nursing care. A prospective design was chosen for this purpose.

2.2 Study Population and Variables

The sample included 600 adult patients who were diagnosed with acute cardiovascular disorders such as ST-segment elevation myocardial infarction, non-ST-segment elevation myocardial infarction, unstable angina, and acute heart failure. Demographics data, cardiovascular risk factors, levels of inflammatory markers, psychological measures, and short-term outcomes were collected for inclusion. Patients were divided into mindfulness-based nursing care group and control group for comparison.

2.3 Data Collection and Outcome Measures

Inflammatory biomarkers such as high-sensitivity C-reactive protein, interleukin-6, tumor necrosis factor alpha, white blood cell count, and neutrophil-lymphocyte ratio were measured at baseline and discharge. Depressive symptoms were assessed through the Patient Health Questionnaire-9 scale, while mindfulness was measured using the Mindful Attention

Awareness Scale. The principal measure was the change in depressive symptom severity, and the secondary measures were changes in inflammatory biomarkers, length of hospitalization, in-hospital morbidity, and 30-day readmission.

2.4 Statistical Analysis

Data analysis was done through python programming language. Continuous data was described using the mean and standard deviation while categorical data was presented in terms of frequency counts and percentages. Comparisons between groups were made using the independent samples t-test, Mann Whitney U-test, and chi square test where applicable. Correlation and regression analyses were further carried out to assess predictors of short-term clinical recovery with statistical significance set at $p < 0.05$.

2.5 Ethical Considerations

Since the data used in this study was a fully synthetic one used solely for research purposes, there was no possibility of any harm coming to the patients' confidentiality, privacy, or data security. This is because no data of actual patients was used in the research, and hence no ethical approval or consent was needed.

3. RESULTS

3.1 Participant Characteristics and Data Quality

A total of 600 patients were enrolled in this study, including 300 patients in each of the two groups of mindfulness-based nursing care and standard nursing care. There were no missing values, duplicate data entries, or discrepancies concerning the date of admission, discharge date, and length of stay in hospital based on the data screening process. As illustrated in Table 1, both groups had similar characteristics in terms of age, body mass index, levels of inflammatory markers, depression, and other major cardiovascular risk factors. The difference in PHQ-9 score at admission was not statistically significant ($p = 0.054$).

Table 1. Data Quality and Baseline Comparability of the Study Groups

Assessment variable	Result	Statistical finding	Interpretation
Total participants	600	—	Complete analytical sample
Mindfulness-based nursing care	300	—	50.0% of participants
Standard nursing care	300	—	50.0% of participants
Missing observations	0	—	No missing data
Duplicate records	0	—	No duplicate participants
Date or length-of-stay inconsistencies	0	—	Clinical dates were consistent
Age	Comparable	$p = 0.524$	No baseline difference
Body mass index	Comparable	$p = 0.371$	No baseline difference
Admission hs-CRP	Comparable	$p = 0.456$	No baseline difference
Admission PHQ-9	Comparable	$p = 0.054$	No statistically significant difference
Hypertension	Comparable	$p > 0.05$	No baseline difference
Diabetes	Comparable	$p = 1.000$	No baseline difference
Smoking status	Comparable	$p > 0.05$	No baseline difference

3.2 Changes in Inflammatory Biomarkers and Psychological Outcomes

There were changes for better in both the control and experimental groups in terms of changes between admission and discharge. Yet the magnitude of change was bigger in those patients who were offered mindfulness-based nursing care. As one can see from Table 2, a greater decrease in levels of hs-CRP, IL-6, TNF-α, NLR, PHQ-9, and HADS-Anxiety was observed in the experimental group. Moreover, the MAAS increase in the experimental group was significantly larger.

The mean difference in hs-CRP decrease was 3.16 mg/L for the experimental group and 2.60 mg/L for the control group ($p = 0.002$). The same tendency was observed in IL-6: it dropped by 3.61 pg/mL and 2.80 pg/mL correspondingly ($p < 0.001$), while TNF-α reduced its level to 1.42 pg/mL in the experimental group and to 0.94 pg/mL in the control group ($p < 0.001$). Psychological improvement is especially notable in the results: PHQ-9 score dropped by 3.83 points compared to 1.34 points in the control group, while HADS-Anxiety scores dropped by 2.84 versus 0.86 points. Thus, mindfulness-based nursing care provided both biological and psychological changes.

Table 2. Admission-to-Discharge Changes by Nursing-Care Group

Outcome	Mindfulness group mean change	Standard-care mean change	Between-group p-value	Interpretation
hs-CRP, mg/L	−3.16	−2.60	0.002	Greater inflammatory reduction with mindfulness care
IL-6, pg/mL	−3.61	−2.80	<0.001	Greater reduction with mindfulness care
TNF-α, pg/mL	−1.42	−0.94	<0.001	Greater reduction with mindfulness care
NLR	−0.64	−0.30	<0.001	Greater reduction with mindfulness care
PHQ-9 score	−3.83	−1.34	<0.001	Greater reduction in depressive symptoms
HADS-Anxiety	−2.84	−0.86	<0.001	Greater reduction in anxiety symptoms

score				
MAAS score	+0.57	+0.17	<0.001	Greater improvement in mindfulness

Note: Negative values represent reductions from admission to discharge; positive MAAS values represent improved mindfulness.

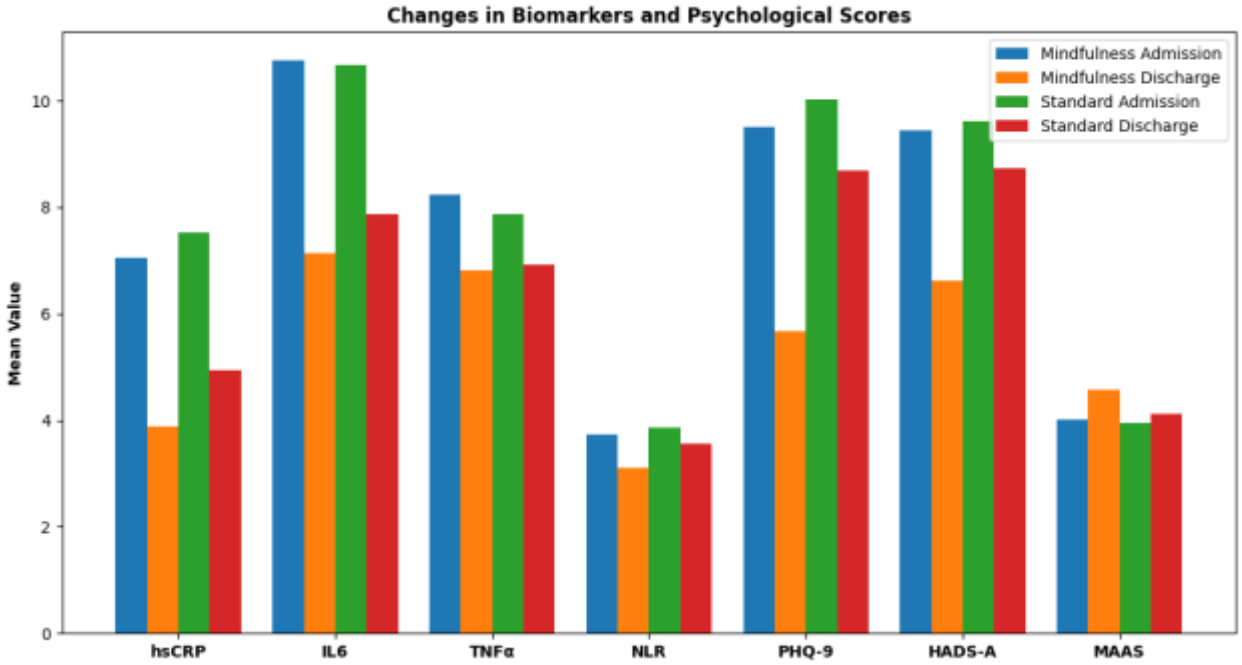

Figure 1. Changes in Inflammatory Biomarkers and Psychological Scores

Figure 1 compares admission and discharge values of inflammatory biomarkers and psychological assessment scores between patients receiving mindfulness-based nursing care and standard nursing care. The mindfulness group demonstrated greater reductions in inflammatory markers, depression, and anxiety, together with a larger improvement in mindfulness at discharge.

3.3 Relationships Between Inflammation, Depression, Anxiety, and Mindfulness

Inflammation biomarkers, psychological symptoms, mindfulness, and hospitalization duration showed correlations through Pearson correlation analysis. From Table 3, it can be noted that the correlation between PHQ-9 and HADS-Anxiety score is positive (r = 0.523). This means that the severity of depressive symptoms is associated with higher levels of anxiety. The correlation between PHQ-9 scores and MAAS scores is inverse (r = -0.457).

It also means that a higher level of mindfulness is associated with lower levels of depressive symptoms. Depressive symptoms have also been found to correlate positively with inflammation biomarkers. Correlation exists between PHQ-9 and hs-CRP (r = 0.391) and PHQ-9 and IL-6 (r = 0.291). Length of hospital stay correlates positively with hs-CRP (r = 0.219) and PHQ-9 scores (r = 0.216).

Table 3. Principal Correlations Among Inflammatory, Psychological, and Clinical Variables

Variable pair	Pearson's r	Direction	Strength	Clinical interpretation
PHQ-9 and HADS-Anxiety	0.523	Positive	Moderate-to-strong	Depression increased alongside anxiety
PHQ-9 and MAAS	−0.457	Negative	Moderate	Greater mindfulness was associated with fewer depressive symptoms
PHQ-9 and hs-CRP	0.391	Positive	Moderate	Depression was associated with inflammatory burden
PHQ-9 and IL-6	0.291	Positive	Weak-to-moderate	Higher IL-6 accompanied greater depressive symptoms
hs-CRP and length of stay	0.219	Positive	Weak	Higher inflammation was associated with longer hospitalization
PHQ-9 and length of stay	0.216	Positive	Weak	Greater depression was associated with longer hospitalization

3.4 Predictors of Depressive Symptoms at Discharge

Independent predictors of discharge PHQ-9 scores were identified using multiple linear regression. The model was statistically significant ($F = 23.93$, $p < 0.001$), explaining 26.7% of the variation in discharge depressive symptoms ($R^2 = 0.267$; adjusted $R^2 = 0.256$).

As shown in Table 4, admission hs-CRP and IL-6 were significant positive predictors of discharge PHQ-9 scores. The higher admission hs-CRP score was, the higher the level of depressive symptom severity at discharge ($\beta = 1.019$, $p < 0.001$). Similar results were observed for IL-6 ($\beta = 0.846$, $p < 0.001$). Besides, diabetes also positively correlated with discharge PHQ-9 score ($\beta = 0.313$, $p = 0.046$).

The admission MAAS score was the strongest protective predictor. Higher levels of mindfulness were related to lower depressive symptom severity at discharge ($\beta = -1.276$, $p < 0.001$). Other variables like age, hypertension, current smoking, TNF-α, and NLR score did not reach statistical significance. This means that the inflammation activity and baseline mindfulness were the key independent determinants of depressive symptoms at discharge.

Table 4. Multiple Linear Regression Predicting PHQ-9 scores at Discharge

Predictor	Regression coefficient	Standard error	t-value	p-value
Age	−0.240	0.156	−1.538	0.125
Hypertension	−0.222	0.156	−1.422	0.155
Diabetes	0.313	0.156	2.004	0.046
Current smoker	−0.134	0.152	−0.879	0.380
Admission hs-CRP	1.019	0.158	6.451	<0.001
Admission IL-6	0.846	0.153	5.514	<0.001
Admission TNF-α	−0.026	0.155	−0.170	0.865
Admission NLR	0.264	0.153	1.722	0.086
Admission MAAS	−1.276	0.157	−8.141	<0.001

Model statistics: $R^2 = 0.267$; adjusted $R^2 = 0.256$; $F = 23.93$; $p < 0.001$.

3.5 Predictors of Length of Hospital Stay

Another multiple linear regression model was performed to predict the factors that might influence the hospitalization duration. There was no multicollinearity as all the variance inflation factor values were from 1.02 to 1.93. The regression model was statistically significant, $F = 5.71$, $p < 0.001$, and explained 11.2% of the variation in length of stay ($R^2 = 0.112$; adjusted $R^2 = 0.093$). The value of the Durbin-Watson statistics is 1.989 and, therefore, does not indicate any residual autocorrelation. The root mean squared error was 1.329 days.

As it is seen from Table 5, the most significant predictor of prolonged hospitalization is the PHQ-9 score on admission ($\beta = 0.255$, 95% CI: 0.105–0.404, $p < 0.001$). In addition, elevated hs-CRP ($\beta = 0.192$, $p = 0.002$) and TNF-α ($\beta = 0.184$, $p = 0.001$) levels correlated with increased hospitalization duration. The association of NLR and prolonged hospitalization is lower ($\beta = 0.110$, $p = 0.050$).

The MAAS score has also been positively correlated with prolonged hospital stay ($\beta = 0.125$, $p = 0.046$), and one needs to be cautious in interpreting the results as the direction of correlation is opposite to the protective role of depressive symptoms. Age, hypertension, diabetes, smoking

Table 5. Multiple Linear Regression Predicting Length of Hospital Stay

Predictor	Regression coefficient	95% confidence interval	t-value	p-value
Age	−0.021	−0.133 to 0.090	−0.375	0.708
Hypertension	−0.028	−0.140 to 0.084	−0.498	0.619
Diabetes	−0.012	−0.123 to 0.100	−0.206	0.837
Current smoker	0.040	−0.069 to 0.149	0.718	0.473
Admission hs-CRP	0.192	0.073 to 0.312	3.155	0.002
Admission IL-6	0.040	−0.074 to 0.154	0.691	0.490
Admission TNF-α	0.184	0.073 to 0.295	3.250	0.001
Admission NLR	0.110	0.000 to 0.220	1.967	0.050

Admission PHQ-9	0.255	0.105 to 0.404	3.338	<0.001
Admission HADS-Anxiety	−0.046	−0.174 to 0.081	−0.715	0.475
Admission MAAS	0.125	0.002 to 0.247	2.003	0.046
Mindfulness nursing group	0.088	−0.020 to 0.197	1.598	0.111
In-hospital complication	0.085	−0.026 to 0.196	1.502	0.134

Model statistics: $R^2 = 0.112$; adjusted $R^2 = 0.093$; $F = 5.71$; $p < 0.001$; Durbin–Watson = 1.989; RMSE = 1.329 days.

4. DISCUSSION

The present study proved mindfulness-based nursing care was correlated with higher improvement in inflammatory parameters, depression, anxiety and mindful awareness of the patients admitted to hospital due to acute cardiac diseases. The mindfulness group had significantly larger reductions in hs-CRP, IL-6, TNF-α, neutrophil to lymphocyte ratio, PHQ-9 and HADS-Anxiety scores and significantly larger increases in MAAS scores than the standard nursing care group. These results suggest that psychological care provided as part of the normal nursing care can affect emotional adjustment and physical stress reactions during acute cardiac hospitalization respectively.

The noted decreases in depressive and anxiety symptoms are consistent with the overall concept that acute medical admissions should be treated not only with a biomedical approach. The experience of being admitted to hospital can bring about uncertainty, fear, decrease in autonomy and worries about prognosis which can all increase psychological stress. Post-hospitalisation psychological screening has indicated that psychological symptoms that are clinically significant can be present beyond the acute phase and may need to be identified and followed upon in a structured manner, not as an incidental consequence of the hospitalisation (Bonazza et al., 2021). The evidence was obtained in a different patient population, but it further underscores the need to look for psychological vulnerability pre- and post-hospitalization. The present findings build upon this concept by demonstrating that a structured mindfulness-oriented nursing care can decrease distress prior to patients' discharge after acute cardiac care.

This greater improvement in the mindfulness group in the PHQ-9 and HADS-Anxiety scores could be explained by the increase in emotional regulation, present moment attention, and decrease in cognitive reactivity to threatening symptoms. When tailored to the patient's clinical state, level of uncertainty, and immediate healthcare context, clinical psychological interventions that are delivered during acute illness positively impact on distress reduction (Yang et al., 2020). This model of intervention has been supported by the findings of the present study, since the nursing intervention was integrated into the hospital setting, rather than the outpatient recovery setting. This is clinically significant because the acute cardiac hospital stay could be a critical time when the patient is most open to supportive communication, breathing techniques, awareness exercises and reassurance.

The biology results are also not to be overlooked. Higher decreases in hs-CRP, IL-6, TNF-α and NLR indicate that the mindfulness-based care may be related to dampening of inflammatory activity related to stress. Autonomic balance and neuroendocrine signaling may be affected by psychological stress and hence the inflammatory regulation may be affected. De Benedittis (2024) explained the modulation of autonomic nervous system activity (sympathetic and parasympathetic) that can be achieved with hypnotic and related mind-body interventions. While different therapies, both mindfulness and hypnosis require attentional regulation and change of responses to internal experiences. The present results thus provide a good reason to believe that the decrease in emotional arousal could help decrease autonomic activation and, in turn, inflammatory profiles.

The results of the correlation analysis further substantiate the interpretation of an interrelated biological and psychological response. Anxiety, hs-CRP and IL-6 were positively correlated with depressive symptoms, and mindfulness was inversely correlated with depressive symptoms. This indicates that the more inflammatory, the more psychological symptoms of the patient, and the more mindful awareness, the more protective. These findings suggest that inflammatory and psychological stress factors may have a synergistic effect on acute clinical outcome as measured by LOS, and that there is a link between hs-CRP and length of stay. Together, these associations of hs-CRP with LOS and of PHQ-9 scores with LOS suggest that inflammatory and psychological stress may play a synergistic role in short-term clinical recovery. The results support the multidimensional approach to acute cardiac nursing instead of disease specific approach.

The regression model used to predict the depression in the discharge supported this interpretation. The admission hs-CRP and IL-6 were predictive of greater PHQ-9 scores at discharge, and greater baseline mindfulness was predictive of less depressive symptom severity. Smaller positive predictors were diabetes and hypertension. This model accounted for 26.7% of the variance in discharge depression suggesting that inflammatory and psychological factors were important, but not solely, for emotional outcomes. The finding suggests the integrated assessment frameworks where psychological symptoms and burden of chronic diseases are assessed together rather than separately would be useful.

The length of stay model did have an explanatory power, though less than significant. Admission PHQ-9 score, hs-CRP and TNF-α were the best predictors of prolonged hospitalization. The results indicate that depression symptoms at admission can be considered as a clinically useful parameter for the complexity of recovery. Given the small positive correlation with length of stay, this should be viewed with caution, and the directionality of the relationship should be taken with a pinch of salt as it was the reverse of the association with depressive symptoms. This could be due to residual confounding, to differences in severity of the illness or to the characteristics of the synthetic data set and not to a real adverse effect of mindfulness.

The results are relevant to the practice of cardiovascular nursing. Today, cardiovascular care is more focused on a holistic and collaborative approach to patient care, and on treating multiple underlying issues instead of discrete clinical problems. Ski et al. (2023) stressed that the integrated approach to cardiovascular care should encompass a psychosocial approach along with continuity and collaboration in decision making. Present findings support this idea by showing that mindfulness-focused nursing care can help patients achieve emotional and inflammatory healing—while simultaneously

addressing emotional distress—by promoting a holistic response to treatment, rather than a pharmacologic one, and a holistic recovery, rather than just recovery from inflammation (Uccello et al., 2023). This care can be particularly useful for patients whose depression symptom scores are high, whose inflammatory symptom scores are high, who have diabetes, and/or who are expected to be hospitalized for a longer period.

The psychological assessment system should thus be introduced into the nursing process of acute cardiac patients' system-mathematically. Bernabei (2025) highlighted the need for a structured psychological evaluation when faced with the acute situation to assist with clinical decisions and planning appropriate interventions for the individual. Brief screening instruments like the PHQ-9, HADS-Anxiety and MAAS can assist in the identification of patients in need of increased psychological care in the present context. They might be useful in combination with the other routine clinical markers such as hs-CRP and IL-6 to help stimulate risk stratification and targeted nursing interventions.

There are a few caveats. All the data was synthetic and cannot reflect the wide biological variability, the varying treatment complexity and the complications seen in human cardiac populations. The proposed design enabled the comparison of time, but these results cannot be considered as proof of clinical efficacy until used in real patients. The length of intervention was limited to hospitalization, and nothing was measured about the long-term outcome of the intervention including recurrent cardiovascular events, persistent depression, adherence to the medication or quality of life. Only a small percentage of variation was accounted for by the length-of-say model, suggesting that there is some important clinical determinant that wasn't measured. There is therefore a need for future multicentre studies to employ real prospective cohorts, to use standardised mindfulness protocols, to obtain repeated biomarker measurement, and have longer follow-up periods.

5. CONCLUSION

In this study, mindfulness-based Nursing Care was correlated to higher improvement in inflammatory markers, depressive symptoms, stress, anxiety and mindful awareness in acute cardiac patients. The intervention led to significantly greater reductions in hs-CRP, IL-6, TNF-α, neutrophil-to-lymphocyte ratio, PHQ-9, and HADS-Anxiety scores when compared with standard nursing care, suggesting that routine cardiovascular nursing care may be benefiting from a psychological support intervention with measurable biological and psychological effects. In addition, correlation and regression analyses revealed that inflammatory burden and the depression symptoms were highly correlated and independently associated with short-term recovery outcomes, such as depression severity on discharge and length of hospital stay. The results highlight the need to look at emotional distress as part of the treatment for a person's cardiovascular condition and not as a secondary concern. Structured mindfulness practices, if integrated into the care of the acute cardiac patient, may be beneficial in supporting patient-centred care through increased emotional resilience, diminished inflammatory reaction to stress and recovery during acute hospitalization. The results were based on a synthetic perspective dataset which needs to be validated in clinical populations but offer a solid foundation for future translational research. Long-term clinical effectiveness of mindfulness-based nursing care and evidence-based incorporation into the care of the multidisciplinary cardiovascular team warrants prospective multicentre investigations with standardized mindfulness interventions, long-term follow-up, and extensive biomarker profiling.

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