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Exploring the complex interplay between acute stress, anxiety, and depression: a cross-sectional analysis among emergency department patients

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Authors' contribution:

A. Study design/planning
B. Data collection/entry
C. Data analysis/statistics
D. Data interpretation
E. Preparation of manuscript
F. Literature analysis/search
G. Funds collection

Abstract

Background. This study evaluated acute stress symptom severity, anxiety, and depression levels in emergency department patients and examined their interrelationships.
Material and methods. A cross-sectional design was employed. The Acute Stress Symptom Severity Scale (ASSSS) assessed stress severity, while the Hospital Anxiety and Depression Scale (HADS) evaluated anxiety and depression. Descriptive statistics and correlation analyses were conducted.
Results. The mean ASSSS score was 8.77±3.43, indicating moderate acute stress, with scores ranging from 2.0 to 20.0 and a median of 9.0. The mean HADS-Anxiety score was 9.14±3.33, with a median of 10.0, reflecting moderate anxiety (range: 2.0-19.0). The mean HADS-Depression score was 11.07±4.41, with a median of 10.0, indicating moderate depression with more variability (range: 1.0-21.0). Correlation analyses showed a weak positive relationship between the ASSSS and HADS-Anxiety scores (r=0.290, p<0.001), suggesting higher acute stress is linked to increased anxiety. A weak negative correlation between the ASSSS and HADS-Depression scores (r=-0.364, p<0.001) indicated higher stress is associated with lower depression levels.
Conclusions. Acute stress is moderately prevalent in emergency patients and positively correlates with anxiety while negatively correlating with depression. Integrated approaches are essential for managing these interconnected conditions in emergency care.

Keywords: acute stress, anxiety, depression, emergency, nursing

Introduction

Acute stress, anxiety, and depression are common psychological responses observed in patients visiting emergency departments (EDs), often exacerbated by the critical nature of the situations that bring them to these settings [1]. These psychological symptoms affect not only mental health but also overall recovery. Understanding the interplay between acute stress, anxiety, and depression is crucial, especially for healthcare providers in emergency settings to offer comprehensive care that addresses both physical and psychological needs. Many studies have shown that anxiety, stress, and depression are

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prevalent among ED patients, complicating their clinical care [1,2]. For instance, anxiety and depression rates in ED patients are significantly higher compared to the general population, and these conditions often go unaddressed due to competing priorities in the ED [2,3]. Marchesi et al. [4] found that anxiety disorders are more common in ED patients, while depression is more frequent in medical units, emphasizing the need to address both in clinical management. Additionally, the ED environment can exacerbate stress and anxiety, negatively impacting the patient's experience [1]. Koyuncu and Karcıoğlu [5] noted that patients with systemic diseases or acute exacerbations of chronic conditions tend to have higher anxiety levels, further complicating care [5]. Moreover, studies have shown that the use of complementary therapies, such as animal-assisted or music therapy, can significantly reduce stress and anxiety in ED patients, improving their overall experience [6,7].

Clinicians in the ED are often primarily focused on the immediate physical health of the patient. However, unaddressed psychological conditions like stress, anxiety, and depression can impede recovery and complicate the management of acute physical illnesses. Studies have shown that timely psychological intervention can reduce hospital stays, lower re-admission rates, and improve overall patient outcomes [5,6].

Recent studies have highlighted significant correlations between acute stress and both anxiety and depression in emergency settings. For example, research shows that increased acute stress is positively associated with increased levels of anxiety among patients, which can further complicate their clinical management [7,8]. Conversely, there is evidence suggesting that acute stress might have a complex relationship with depression, where it can sometimes be inversely correlated. Recent literature presents conflicting findings regarding the association between anxiety, stress, and depression in ED patients. While some studies suggest that acute stress exacerbates both anxiety and depression, others indicate that these relationships may differ based on the context or the severity of symptoms. Understanding these nuances is crucial for ED clinicians, as the psychological state of a patient can significantly influence both immediate care strategies and long-term outcomes. For example, effective management of stress and anxiety in the ED has been shown to reduce hospital stays and improve recovery rates [9,10].

Although prior studies have examined the relationship between stress, anxiety, and depression in general medical settings, there is a lack of focused research exploring how these psychological states interact specifically in ED patients. This study aims to fill this gap by investigating these relationships in a high-pressure, acute care setting.

Conflicting findings in literature indicate that the interaction between stress, anxiety, and depression may vary under different clinical circumstances. Recognizing and addressing these psychological factors is crucial, as mental health can significantly influence both short-term treatment and long-term recovery. Effective stress and anxiety management in the ED patients has been shown to reduce hospital stays and improve recovery rates [11-13]. While previous studies have explored these relationships in general healthcare settings, there is a lack of focused research examining how these psychological states interact specifically within EDs. This study aims to fill this gap by investigating the interplay between acute stress, anxiety, and depression in a high-pressure ED setting.

Research question: What is the relationship between acute stress, anxiety, and depression in patients presenting to the ED, and how do these psychological conditions impact their clinical management?

Aim of the work

The aim of this study is to determine acute stress symptom severity, anxiety, and depression levels in ED patients and to examine the relationships between them.

Material and methods

Study design and setting

This descriptive and exploratory study was conducted in the ED of the Training and Research Hospital in Istanbul. Data collection began following the acquisition of ethical approval and institutional permissions between March and May 2023.

The inclusion criteria consisted of patients aged 18 and above who presented to the ED with acute conditions and voluntarily agreed to participate in the study.

The exclusion criteria in this study consisted of emergency cases from the yellow and red zones. The yellow and red zones are triage categories indicating the severity of a patient's condition, with red representing critical, life-threatening cases and yellow representing serious but non-critical conditions.

Study population and sampling

A sample size of 220 participants was determined based on a power analysis. A minimum of 200 participants was necessary to achieve a power of 0.80, assuming a moderate effect size (r=0.30) for the correlations between stress, anxiety, and depression. This ensures that the study has sufficient statistical power to detect significant relationships between these variables [14].

Data collection

At the onset of the study, ethical approval and institutional permission were obtained. The data was collected face-to-face by the nurse researcher working in the ED during the triage stage, prior to treatment.

Data collection instruments

Sociodemographic Data Form

The Sociodemographic Data Form includes five questions covering the patient's age, gender, marital status, educational level, and income level. These variables define the independent variables of the study.

Hospital Anxiety and Depression Scale (HADS)

The HADS is a self-reported scale developed by Zigmond and Snaith [15] to assess the risk and severity of anxiety and depression in individuals with physical illnesses or those seeking primary healthcare services. The validity and reliability of the scale in Türkiye were evaluated by Aydemir et al. [16]. The scale's usage permission was obtained from Ömer Aydemir. The scale consists of 14 questions: odd-numbered items (1, 3, 5, 7, 9, 11, and 13) measure anxiety, and even-numbered items (2, 4, 6, 8, 10, 12, and 14) measure depression. The responses are rated on a four-point Likert scale, with scores ranging from 0 to 3. In this study, the Cronbach's alpha value for the HADS was calculated as 0.735. The original version of the scale reported a Cronbach's alpha of approximately 0.80, indicating good internal consistency [15].

Acute Stress Symptom Severity Scale (ASSSS)

The ASSSS, originally designed by Lindeman in 1944, was validated and standardized in Turkish by Aşçıbaşı et al. [17]. This scale consists of seven items and is used to measure acute stress disorder symptoms in individuals aged 18 years and older following a highly stressful event. Each item assesses the severity of ongoing acute stress disorder symptoms over the past seven days on a scale of 0 (none) to 4 (extreme), with a total score ranging from 0-28. In this study, the Cronbach's alpha value for ASSSS was calculated as 0.767. In the Turkish validation study conducted by Aşçıbaşı et al. [17] the scale demonstrated a Cronbach's alpha coefficient of 0.83.

Data analysis

Statistical analyses were performed using the SPSS software package (IBM SPSS Statistics 27). Frequency tables and descriptive statistics played crucial roles in evaluating the findings. To determine the normal distribution of the data, separate tests were applied for each variable considering sample sizes. The Kolmogorov-Smirnov and Shapiro-Wilk tests were utilized on the basis of the sample size.

The relationships between non-normally distributed measurement values were examined via the "Spearman" correlation coefficient. For variables where significant differences were identified among three or more groups, pairwise comparisons were indicated via expressions such as "[1-2, 3]" denoting a significant difference between groups 1 and 2 and between groups 1 and 3.

Results

Data obtained from sociodemographic data form, the ASSSS, and the HADS, which were administered to 220 patients who presented to the ED of the Training and Research Hospital, were analyzed to examine the relationships between acute stress levels and anxiety-depression symptoms (Tables 1 and 2).

Table 1. Distribution of patients according to their sociodemographic characteristics

Variable (n=220)	n	%
Age groups [Mean±SD → 51.54±16.94 (years)]		
<40	53	24.1
40-49	48	21.8
50-59	42	19.1
≥60	77	35.0
Gender		
Female	91	41.4
Male	129	58.6
Marital status		
Single	56	25.5
Married	144	65.4
Divorced	20	9.1
Educational level		
Literate	40	18.2
Primary education	94	42.7
High school	51	23.2
University	35	15.9

Variable (n=220)	n	%
Income level		
Income less than expenses	22	10.0
Income equal to expenses	117	53.2
Income more than expenses	81	36.8
Reasons for hospitalization		
Cardiovascular system	19	8.6
Respiratory system	98	44.5
Gastrointestinal system	72	32.7
Trauma	4	1.8
Neurology	18	8.2

Table 2. Distribution of classifications according to the HADS

Variable (n=220)	n	%
HADS-Anxiety categories		
0-7 points: Normal	62	28.2
8-10 points: Borderline	81	36.8
11 points and above: Abnormal	77	35.0
HADS-Depression categories		
0-7 points: Normal	37	16.8
8-10 points: Borderline	75	34.1
11 points and above: Abnormal	108	49.1

A total of 36.8% (n=81) of the patients in the study were in the borderline category of HADS-Anxiety, and 49.1% (n=108) were in the abnormal category of HADS-Depression (Table 3).

Table 3. Comparison of patients' scores on the HADS and ASSSS

ASSSS (n=220)	
HADS-Anxiety	r=0.290
	p<0.001
HADS-Depression	r=-0.364
	p<0.001

A significant difference was observed between the ASSSS score and HADS-Anxiety score, with a weak positive correlation (r=0.290; p<0.001). As the scores on the ASSSS increase, the HADS-Anxiety scores also increase. Stress and depression were weakly but significantly negatively correlated (r=-0.364, p<0.001). Higher stress was associated with lower depression scores. As the ASSSS score increases, the HADS-Depression score decreases.

Discussion

This study provides valuable insights into the complex relationships between acute stress, anxiety, and depression among patients in ED settings. The discovery that 36.8% of patients fell within the borderline

category for HADS-Anxiety and 49.1% in the abnormal category for HADS-Depression underscores the high prevalence of psychological distress in acute care environments. The findings confirm that acute stress is more closely aligned with anxiety symptoms, while its relationship with depression may be more complex. These findings contribute to a deeper understanding of how acute stress affects mental health in ED patients. The positive correlation between acute stress and anxiety is well-supported by existing literature. Acute stress often exacerbates anxiety, particularly in high-stress environments like the ED, where patients face uncertainty and fear regarding their health. Abar et al. [1] found that anxiety rates are significantly higher in ED patients than in the general population, driven largely by the acute stress experienced in these settings. Similarly, Koyuncu, and Karcıoğlu [5] demonstrated that acute exacerbations of chronic illnesses and the presence of systemic diseases significantly elevate anxiety levels in ED patients, reinforcing the need for early interventions in this context. Interestingly, the negative correlation between acute stress and depression observed in this study deviates from traditional models, which generally predict a positive relationship between stress and depressive symptoms. For instance, Marchesi et al. [4] and Kim et al. [10] found that higher levels of acute stress were associated with increased depressive symptoms in emergency and cardiac care patients. Similarly, Konstantopoulou et al. [12] reported that both clinical and subclinical stress were positively correlated with depression and anxiety levels, suggesting that stress typically exacerbates both conditions. However, Schultebraucks et al. [18] proposed that acute stress responses may initially suppress depressive symptoms due to heightened arousal and hypervigilance – especially in the early stages of crisis – potentially leading to a temporary inverse relationship. These contradictory findings underline the complexity of stress-related psychological responses and highlight the need to consider factors such as the timing of symptom assessment, clinical context, cultural influences, and individual coping mechanisms. Our findings may reflect an early-phase psychological profile in which anxiety dominates, while depressive symptoms are less pronounced or emerge later. Marchesi et al. [4] found that stress typically correlates with increased depressive symptoms in medical patients. One potential explanation for the negative correlation in this study is that acute stress triggers immediate, high-arousal responses such as hypervigilance, which overshadow depressive symptoms like low energy or anhedonia. Recent studies suggest that acute stress responses, which activate survival mechanisms, may temporarily suppress depressive tendencies during high-arousal phases [18].

Another plausible explanation is the temporal dynamics of stress and mood disorders. Acute stress may initially trigger anxiety, but as stress persists, depressive symptoms may emerge as psychological and physiological resources are depleted. This progression from anxiety to depression has been documented in longitudinal studies, such as those by Schultebraucks et al. [18], who demonstrated that prolonged stress exposure often leads to a shift from anxiety to depression. In the context of emergency care, patients may be in the early stages of this transition, where anxiety dominates the psychological profile while depressive symptoms remain less evident. This finding suggests the importance of early intervention in managing anxiety to prevent the progression to more severe psychological conditions such as depression or post-traumatic stress disorder (PTSD). Several other studies have highlighted the importance of addressing psychological distress in ED patients to improve both short-term outcomes and long-term healthcare efficiency. For instance, Bentley et al. [19] found that patients with untreated anxiety or depression experienced longer hospital stays and higher rates of readmission.. Timely psychological interventions, such as counseling, pharmacological support, or complementary therapies, can help mitigate these issues. Au and Assavarittirong [6] also found that complementary therapies, including music and art therapy,

were effective in reducing anxiety and improving patient outcomes in hospital settings, suggesting that such therapies could be beneficial in managing acute stress in ED patients.

According to recent reviews, ED patients with unaddressed anxiety and depression are more likely to experience prolonged hospital stays and adverse outcomes [3]. This study did not perform subgroup analyses based on patients' specific medical diagnoses (e.g. respiratory, cardiovascular, gastrointestinal). Yet, it is plausible that different diagnostic categories may present with distinct psychological profiles. Given these findings, it is clear that integrating mental health management into routine ED care could significantly enhance patient recovery and reduce the burden on healthcare systems.

Clinical implications

In terms of clinical implications, these findings highlight the importance of integrating psychological assessments and interventions into the standard care protocols in emergency settings. The incorporation of brief, validated screening tools for anxiety and depression, such as the Generalized Anxiety Disorder (GAD-7) or Hospital Anxiety and Depression Scale (HADS), could facilitate early identification of patients at risk. Timely interventions – whether through psychological support, pharmacological measures, or complementary therapies – could reduce the psychological burden on patients, improve recovery trajectories, and even reduce healthcare costs by minimizing the need for extended care or recurrent visits [17]. Future studies may also consider evaluating the impact of specific interventions – such as brief counseling, stress management education, or complementary therapies – on patient outcomes in emergency settings. Integrating such interventions into routine ED care may help mitigate psychological distress and improve both short- and long-term recovery.

Limitations

This study has several limitations that should be considered when interpreting the results. First, the study was conducted at a single hospital, which limits the generalizability of the findings to other settings. The results may not fully represent the experiences of patients in different geographical regions or healthcare systems. Second, the sample consisted only of patients who voluntarily participated in the study, which could introduce selection bias. Patients with more severe psychological conditions or those who were unwilling to participate may have been underrepresented.

One of the limitations of this study is that it was conducted in a single hospital. Therefore, the results are limited to the responses of patients who presented to that hospital during the data collection period and who voluntarily participated in the study. Cultural and environmental factors play a crucial role in shaping how individuals perceive and react to stress. In some cultures, the expression of psychological symptoms such as anxiety and depression may be minimized or somatized, while in others, emotional distress is more openly expressed and acknowledged. Additionally, environmental stressors such as healthcare accessibility, overcrowding in EDs, and social support systems may influence psychological responses and coping mechanisms. As this study was conducted in a single hospital in Türkiye, the findings may reflect cultural norms specific to this population, and generalization to other cultural contexts should be made with caution. Another limitation is that participation was voluntary, which may introduce selection bias. In addition, the lack of information regarding participants' prior psychiatric diagnoses may have influenced anxiety and depression scores.

Conclusions

This study highlights the complex relationships among acute stress, anxiety, and depression in emergency care patients. The weak positive correlation between acute stress and anxiety aligns with literature, whereas the negative correlation with depression introduces new perspectives on the temporal dynamics of stress-related disorders. Further studies should clarify the mechanisms behind these findings and help in the design of effective interventions for psychological distress in emergency care. While this study provides a snapshot of the psychological status of ED patients, the temporal nature of stress-related disorders cannot be fully understood through cross-sectional data. Longitudinal research is essential to trace the progression of symptoms over time, determine causality, and understand how acute stress may evolve into anxiety, depression, or even PTSD. It is believed that the time patients spend in the ED (e.g. waiting in triage, pre-treatment, and post-treatment periods) may affect their psychological state. However, this study did not differentiate between these time intervals. Future studies are recommended to assess these differences.

Disclosures and acknowledgements

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Before initiating the study, necessary permission was obtained by contacting the owners of the scales via email. Prior to the data collection, the ethical approval was obtained from the Istanbul Okan University Non-Interventional Clinical Research Ethics Committee (Approval Number: 164, March 29th, 2023). Institutional permission was obtained from Koşuyolu High Specialization Training and Research Hospital and the Provincial Health Directorate. The patients were informed about the purpose of the study, and their verbal and/or written consent was obtained.

Artificial intelligence (AI) was not used in the creation of the manuscript.

The data presented in the study can be accessed via contact with the corresponding author.

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