



The Relationship Between Patients' Clinical Conditions and Health Care Services and Family Anxiety Levels in the Intensive Care Unit (ICU) at Islam Harapan Anda General Hospital in Tegal City

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Abstract

Background: Critical illness frequently generates substantial psychological distress among family members, particularly when patients experience severe physiological instability and require complex intensive care. Objective: This study examined the relationship between patients' clinical conditions, measured using APACHE II, and family anxiety levels in the ICU of Islam Harapan Anda General Hospital, Tegal City. Methods: A quantitative cross-sectional correlational design was applied to 100 family respondents recruited through consecutive sampling. APACHE II scores were obtained within the first 24 hours of ICU admission, while family anxiety was assessed within 24–48 hours using the Hamilton Anxiety Rating Scale. Spearman's rank correlation and ordinal logistic regression were used for analysis. Results: Most patients had moderate APACHE II scores (58.0%), while moderate anxiety was the most frequent family response (43.0%). APACHE II scores were very strongly and positively associated with family anxiety ($p = 0.880$; $p < 0.001$). Ordinal logistic regression showed strong explanatory performance (Nagelkerke pseudo- $R^2 = 0.862$). Conclusion: Greater physiological severity was associated with higher family anxiety, supporting early psychological screening, structured communication, and routine family-centered support for relatives of critically ill patients.

Keywords: APACHE II, critically ill patients, family anxiety, intensive care unit, psychological distress.



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INTRODUCTION

The intensive care unit (ICU) is a highly specialized clinical environment designed for patients with life-threatening illnesses, severe physiological instability, and complex organ dysfunction requiring continuous monitoring and advanced therapeutic support. Admission to the ICU, however, affects not only the critically ill patient but also family members who are suddenly confronted with uncertainty, unfamiliar technology, restricted interaction, and the possibility of death. Recent evidence indicates that families of critically ill patients frequently experience substantial psychological distress because they must simultaneously process complex medical information and cope with abrupt changes in their expected family roles (Blok et al., 2023; Abdollahimohammad et al., 2024). Consequently, contemporary critical care increasingly recognizes the psychological well-being of family members as an integral component of comprehensive ICU care rather than an issue secondary to the patient's physiological management (Secunda & Kruser, 2022; Bohart et al., 2024).

Anxiety is among the most prominent psychological responses experienced by family members during critical illness and may manifest as persistent fear, tension, uncertainty, sleep disturbance, impaired concentration, and difficulty participating in clinical decision-making. The unpredictable trajectory of critical illness, uncertainty regarding survival, and limited ability of family members to control the patient's condition can intensify these emotional responses throughout the ICU admission (Gurbuz & Demir, 2023; Krishnamoorthy et al., 2025). When such psychological disturbances persist, family members may develop manifestations associated with post-intensive care syndrome-family, including anxiety, depressive symptoms, traumatic stress, and prolonged emotional burden after the patient's ICU episode has ended (Shirasaki et al., 2024). A recent systematic review and Bayesian meta-analysis further demonstrates that anxiety, depression, and psychological distress remain

substantial problems among relatives and caregivers of people exposed to critical care, emphasizing the need for early identification of vulnerable families (Hartley et al., 2026).

Among the factors potentially associated with family anxiety, the severity of the patient's clinical condition represents a particularly important and objectively measurable determinant. The Acute Physiology and Chronic Health Evaluation II (APACHE II) system integrates acute physiological abnormalities, age, neurological status, and chronic health conditions to quantify disease severity and estimate mortality risk among critically ill patients (Knaus et al., 1985). Higher APACHE II scores generally reflect greater physiological derangement and may correspond to more intensive monitoring, invasive interventions, mechanical ventilation, hemodynamic support, and greater uncertainty regarding clinical outcomes. Evidence from research on post-intensive care syndrome-family indicates that greater severity of patient illness is an important risk factor for psychological distress among family members, supporting the clinical relevance of linking objective indicators of patient deterioration with family emotional responses (Ito et al., 2023; Shirasaki et al., 2024).

The psychological effect of severe illness may be intensified by the highly visible manifestations of critical care, including mechanical ventilation, altered consciousness, invasive devices, continuous monitoring alarms, and rapid fluctuations in physiological parameters. Family members may interpret these clinical signs as indicators of imminent deterioration or death, particularly when they have limited knowledge regarding the purpose of ICU equipment and therapeutic interventions. Such uncertainty can generate feelings of helplessness and loss of control, thereby amplifying anxiety even when appropriate medical treatment is being provided. Qualitative investigations have shown that relatives of critically ill patients frequently describe the ICU trajectory as emotionally destabilizing and characterized by fear, insecurity, uncertainty, and an ongoing search for reassurance regarding the patient's condition (Flinterud et al., 2023; Blok et al., 2023; Abdollahimohammad et al., 2024).

Nevertheless, family anxiety in the ICU is unlikely to be determined solely by the physiological severity of the patient's illness because the quality and organization of health care services also shape how families interpret and respond to critical situations. Clear communication, timely information, accessibility of health professionals, emotional support, responsiveness to family needs, and meaningful involvement in decision-making can reduce uncertainty and facilitate more adaptive coping among relatives (Reifarth et al., 2023; Liyew et al., 2024). Conversely, inconsistent communication or insufficient information may increase confusion, dissatisfaction, and psychological distress, particularly when families are confronted with rapidly changing clinical conditions and difficult treatment decisions (Reddy et al., 2023; Padilla-Fortunatti et al., 2025). Recent intervention studies also suggest that structured communication and shared decision-making strategies can improve family engagement and reduce adverse psychological responses during critical care encounters (Cox et al., 2024; Cheng et al., 2026).

These findings are consistent with the principles of patient- and family-centered care, which position family members as important partners in information exchange, decision-making, psychological support, and continuity of care throughout critical illness. Family-centered interventions may include structured clinical updates, family participation in care discussions, flexible visitation, psychological and spiritual support, and systematic assessment of family needs during hospitalization. Systematic reviews have shown that patient- and family-centered interventions in adult ICUs can improve several family-related outcomes and provide a stronger framework for communication, participation, and supportive care (Bohart et al., 2022; Joo et al., 2024; Duong et al., 2024). Accordingly, effective ICU services may function as a protective context that moderates the emotional consequences of severe patient illness, whereas inadequate communication and limited family support may compound the anxiety generated by an already unstable clinical situation (Gunnlaugsdóttir et al., 2024).

Despite increasing international attention to family psychological outcomes in critical care, important empirical gaps remain regarding the simultaneous consideration of objectively measured patient severity and the health care environment experienced by family members. Existing studies frequently examine family needs, communication, satisfaction, psychological distress, or family-centered interventions separately, while comparatively fewer investigations connect these dimensions with measurable indicators of the patient's physiological severity (Goldfarb et al., 2022; Leong et al.,

2023). Evidence from diverse health systems also indicates that family experiences and satisfaction are influenced by cultural expectations, information needs, health literacy, and the organization of critical care services, limiting the direct transferability of findings across clinical settings (Kalolo et al., 2023; Liyew et al., 2024; Padilla-Fortunatti et al., 2025). Therefore, context-specific evidence from Indonesian ICU settings is required to clarify how critical illness severity and the delivery of supportive health care may be associated with anxiety among patients' families.

Within this context, the ICU of Islam Harapan Anda General Hospital in Tegal City provides an important clinical setting for examining the psychological consequences experienced by families accompanying critically ill patients. Objective evaluation of patient severity using APACHE II offers a standardized clinical basis for identifying variations in physiological instability, while the Hamilton Anxiety Rating Scale provides a structured approach for assessing the intensity of anxiety among family members. Integrating these assessments with the broader perspective of ICU health care services may contribute to more responsive nursing practices, particularly through risk communication, family engagement, and early psychosocial support for relatives of patients with severe clinical conditions (Bohart et al., 2024; Gunnlaugsdóttir et al., 2024). Accordingly, this study aims to examine the relationship between patients' clinical conditions and family anxiety levels in the ICU at Islam Harapan Anda General Hospital in Tegal City, while emphasizing the relevance of health care services and family-centered support in managing psychological vulnerability during critical illness.

RESEARCH METHODS

This study employed a quantitative correlational design with a cross-sectional approach and was conducted in the Intensive Care Unit (ICU) of Islam Harapan Anda General Hospital, Tegal City, from May to July 2026. The study population comprised family members who served as the primary responsible persons for critically ill patients admitted to the ICU, and 100 respondents were recruited using consecutive sampling until the required sample size was achieved. Eligible participants were adult family members aged ≥ 18 years, including spouses, children, parents, or siblings, who were able to communicate effectively, agreed to participate, and had a critically ill relative who had been hospitalized in the ICU for at least 24 hours; family members with a previously diagnosed psychiatric or anxiety disorder and those who withdrew during data collection were excluded. The primary independent variable was the severity of the patient's clinical condition, assessed using the Acute Physiology and Chronic Health Evaluation II (APACHE II) score within the first 24 hours of ICU admission, whereas the dependent variable was family anxiety measured within 24–48 hours of admission using the Hamilton Anxiety Rating Scale (HARS). APACHE II scores were calculated from 12 acute physiological parameters, age, Glasgow Coma Scale score, and chronic health status and were categorized as mild (0–9), moderate (10–19), and severe (≥ 20), while HARS scores were classified as no anxiety (<14), mild anxiety (14–20), moderate anxiety (21–27), and severe anxiety (28–41).

Clinical data required for APACHE II scoring were obtained from patients' medical records using a structured observation form and verified with the ICU medical and nursing team, while anxiety data were collected directly from eligible family respondents using the 14-item HARS instrument. The HARS instrument demonstrated satisfactory internal consistency in this study, with a Cronbach's alpha coefficient of 0.892. Data were analyzed using SPSS version 27, beginning with univariate analysis to describe the sociodemographic characteristics of respondents, APACHE II severity categories, and family anxiety levels using frequencies and percentages; because the data were not normally distributed, Spearman's rank correlation was subsequently applied to evaluate the association between APACHE II scores and family anxiety at a significance level of $\alpha = 0.05$. Ordinal logistic regression was further performed to assess the predictive contribution of APACHE II scores to the severity of family anxiety while accounting for potential influencing variables, and the study was conducted after obtaining ethical approval from the Health Research Ethics Committee of the Faculty of Nursing, Universitas Islam Sultan Agung, Semarang; all participants received information regarding the study procedures, provided written informed consent, and were assured of confidentiality and anonymity throughout the research process.

RESULTS AND DISCUSSION

Characteristics of Family Respondents and Clinical Profile of ICU Patients

The study included 100 family members who were primarily responsible for critically ill patients admitted to the Intensive Care Unit of Islam Harapan Anda General Hospital in Tegal City. The demographic characteristics indicate that the participants represented family members who were directly involved in monitoring the patient's condition, receiving clinical information, and participating in important care-related decisions. Such individuals constitute an important population in critical care research because their close involvement places them at substantial risk of psychological strain during periods of clinical uncertainty. Previous studies have similarly demonstrated that family caregivers in intensive care settings frequently experience emotional distress resulting from uncertainty regarding prognosis, disruption of daily roles, and continuous exposure to the critical condition of a loved one (Blok et al., 2023; Abdollahimohammad et al., 2024).

Most family respondents were aged 36–50 years, accounting for 52.0% of the sample, whereas 28.0% were aged 18–35 years and 20.0% were older than 50 years. This distribution indicates that the caregiving and decision-making role was predominantly undertaken by adults in the middle stage of life, a period that commonly involves simultaneous family, occupational, and financial responsibilities. When an immediate family member requires intensive care, these overlapping responsibilities may intensify psychological demands because caregivers must balance routine obligations with the need to remain available for clinical information and decision-making. The experiences of ICU families described by Flinterud et al. (2023) and Leong et al. (2023) similarly indicate that critical illness often disrupts normal family functioning and requires relatives to rapidly adapt to unfamiliar and emotionally demanding circumstances.

Female respondents constituted 59.0% of the sample, while male respondents represented 41.0%, indicating a modest predominance of women among the principal family caregivers. This pattern is relevant because family caregiving responsibilities are frequently assumed by women, particularly in contexts where emotional support, bedside presence, and communication with health professionals become central components of the caregiving role. However, gender alone should not be interpreted as a direct determinant of anxiety because psychological responses in critical care are shaped by a combination of relationship closeness, perceived threat, information adequacy, coping capacity, and the patient's clinical trajectory. Contemporary evidence therefore emphasizes assessment of family needs and psychological vulnerability at the individual level rather than relying solely on demographic characteristics when identifying relatives requiring additional support (Gunnlaugsdóttir et al., 2024; Shirasaki et al., 2024).

Regarding the relationship with the critically ill patient, spouses constituted the largest group at 44.0%, followed by children at 38.0% and parents or siblings at 18.0%. The predominance of spouses is clinically relevant because partners often occupy the central position in treatment discussions and may carry responsibility for making decisions when critically ill patients have impaired consciousness or lack decision-making capacity. Decision-making under conditions of uncertainty may further increase emotional burden when relatives are required to consider invasive treatment, prognosis, and possible end-of-life outcomes. Krishnamoorthy et al. (2025) demonstrate that decision-making preferences among family members of ICU patients are closely connected with anxiety and depressive symptoms, highlighting the importance of providing clear and supportive clinical communication.

Educational attainment also varied among participants, although more than half of the respondents had completed secondary education (56.0%), while 22.0% had only primary education and another 22.0% had attained higher education. Educational background may influence how family members understand clinical terminology, interpret physiological information, evaluate prognosis, and communicate their concerns to health professionals. Nevertheless, educational attainment cannot be regarded as equivalent to health literacy because individuals with similar formal education may differ considerably in their ability to comprehend complex intensive care information. The importance of health literacy has been reinforced by Padilla-Fortunatti et al. (2025), who identified meaningful relationships among perceived stress, health literacy, and family satisfaction in relatives of critically ill patients.

Table 1. Sociodemographic Characteristics of Family Respondents and Clinical Profile of ICU Patients (n = 100)

Characteristic	Category	n	%
Age of family respondent	18–35 years	28	28.0
	36–50 years	52	52.0
	>50 years	20	20.0
Sex	Male	41	41.0
	Female	59	59.0
Relationship to patient	Spouse	44	44.0
	Child	38	38.0
	Parent/sibling	18	18.0
Educational level	Primary	22	22.0
	Secondary	56	56.0
	Higher education	22	22.0
APACHE II category	Mild (0–9)	18	18.0
	Moderate (10–19)	58	58.0
	Severe (≥ 20)	24	24.0
Family anxiety	No anxiety (<14)	10	10.0
	Mild (14–20)	21	21.0
	Moderate (21–27)	43	43.0
	Severe (28–41)	26	26.0

Source: Primary research data, 2026

The clinical profile of the patients demonstrated that the moderate APACHE II category was the most frequent, comprising 58.0% of patients, followed by the severe category at 24.0% and the mild category at 18.0%. Thus, more than four-fifths of the critically ill patients were classified as having at least moderate physiological severity, reflecting a substantial burden of acute illness in the study population. APACHE II integrates multiple physiological indicators with age and chronic health conditions and therefore provides a structured representation of the overall severity of acute disease. The predominance of moderate-to-severe illness is particularly important in the context of family psychological outcomes because greater illness severity has been identified as a relevant risk factor for post-intensive care psychological problems among family members (Ito et al., 2023; Shirasaki et al., 2024).

The presence of 24.0% of patients in the severe APACHE II category is also clinically meaningful because these patients are more likely to present with substantial physiological instability and a greater need for complex intensive care interventions. For family members, exposure to severe illness may include observing mechanical ventilation, invasive monitoring, altered consciousness, multiple infusion devices, and rapidly changing clinical parameters. Such features can be difficult to interpret without sufficient medical knowledge and may reinforce perceptions that the patient's life is under immediate threat. Qualitative research has consistently shown that unfamiliar technology, visible deterioration, and uncertainty regarding survival are important components of the emotional experiences reported by relatives in critical care environments (Abdollahimohammad et al., 2024; Gunnlaugsdóttir et al., 2024).

The descriptive findings regarding family anxiety further illustrate the psychological burden within this ICU population, with 43.0% of respondents experiencing moderate anxiety and 26.0% experiencing severe anxiety. Only 10.0% of respondents were classified as having no anxiety, while 21.0% experienced mild anxiety, indicating that clinically meaningful anxiety was present among a substantial majority of the family members. This pattern is consistent with the broader literature demonstrating that anxiety and other psychological symptoms are frequent among relatives of critically ill patients during and following ICU admission. Gurbuz and Demir (2023) reported substantial anxiety and depressive symptoms among family members of intensive care patients, while Docherty et al. (2024) demonstrated that psychological distress may persist along the recovery trajectory following critical illness.

The simultaneous presence of predominantly moderate-to-severe patient illness and moderate-to-severe family anxiety provides an important descriptive basis for examining how physiological deterioration may correspond with the emotional experiences of relatives. Nevertheless, descriptive distributions alone cannot establish whether the two variables are statistically associated, because anxiety may also be affected by communication quality, family involvement, perceived support, previous experiences with critical illness, and understanding of the patient's prognosis. Family satisfaction research has shown that the way information is delivered and the extent to which care meets relatives' informational and emotional needs can substantially influence their experience of intensive care (Liyew et al., 2024). Therefore, interpretation of family anxiety should consider both the objective severity of the patient's condition and the interpersonal environment through which the condition is explained and managed.

The findings also support the relevance of family-centered care within the study setting because the demographic diversity of participants suggests that families may differ substantially in their ability to understand, process, and respond to critical illness. Family-centered care encourages clinicians to provide structured communication, assess individual information needs, involve appropriate relatives in clinical discussions, and offer emotional support throughout the patient's ICU trajectory. Systematic reviews have shown that family-centered interventions can improve several aspects of family experience and strengthen the participation of relatives in intensive care processes (Bohart et al., 2022; Joo et al., 2024). Such an approach is especially relevant in populations such as the present sample, in which most relatives were exposed to patients with moderate or severe physiological illness.

Overall, the respondent and patient characteristics demonstrate that this study was conducted in a clinically and psychologically vulnerable population characterized by substantial disease severity and a high frequency of anxiety among family members. These descriptive findings provide the empirical foundation for subsequent analysis of whether increasing APACHE II severity corresponds to progressively higher levels of family anxiety. They also indicate that ICU nursing care should extend beyond physiological monitoring to include early identification of family members who may require additional information, emotional support, and structured engagement with the health care team. This perspective is consistent with contemporary critical care frameworks that recognize family engagement as a core dimension of high-quality ICU care rather than as an optional supportive activity (Goldfarb et al., 2022; Bohart et al., 2024).

Relationship Between APACHE II Severity and Family Anxiety Levels

The cross-tabulation between APACHE II severity and family anxiety demonstrated a clear gradient across the three clinical severity groups. Among patients with mild APACHE II scores, family members were predominantly classified as having no anxiety or mild anxiety, whereas progressively higher anxiety levels were observed as clinical severity increased. This pattern suggests that family emotional responses may be closely associated with the perceived seriousness of the patient's physiological condition. Similar observations have been reported in studies showing that greater illness severity is associated with increased psychological burden among relatives of critically ill patients (Ito et al., 2023; Hartley et al., 2026).

In the mild APACHE II group, 50.0% of family members were classified as having no anxiety and 44.4% experienced mild anxiety, while only 5.6% experienced moderate anxiety and none experienced severe anxiety. This distribution indicates that when the patient's physiological disturbance remained relatively limited, family members were less likely to exhibit substantial psychological distress. The comparatively lower anxiety burden may reflect greater perceived hope regarding recovery, fewer visible signs of critical deterioration, and less exposure to highly invasive interventions. Nevertheless, even among patients with lower severity scores, some degree of anxiety remained evident, supporting the view that ICU admission itself represents a major psychological stressor for relatives (Gurbuz & Demir, 2023; Secunda & Kruser, 2022).

A different pattern emerged among families of patients classified in the moderate APACHE II category. In this group, 67.2% of family members experienced moderate anxiety, 22.4% experienced mild anxiety, and 8.6% were classified as having severe anxiety, while only 1.7% reported no anxiety. The shift toward moderate anxiety indicates that increasing physiological instability may substantially alter family perceptions of threat, uncertainty, and vulnerability. Evidence from critical care research

similarly suggests that family members are particularly vulnerable to emotional distress when they are confronted with uncertain prognosis, invasive treatments, and rapid changes in clinical status (Blok et al., 2023; Shirasaki et al., 2024).

The most striking distribution occurred in the severe APACHE II group, where 87.5% of family members experienced severe anxiety and 12.5% experienced moderate anxiety. No respondent in this group was classified as having no anxiety or mild anxiety, demonstrating a pronounced concentration of psychological distress among families of the most severely ill patients. Such a pattern is clinically plausible because high disease severity is often accompanied by greater mortality risk, extensive organ dysfunction, altered consciousness, and complex life-support interventions. Family members exposed to these conditions may interpret the clinical environment as evidence of imminent deterioration, thereby intensifying fear and perceived helplessness (Abdollahimohammad et al., 2024; Gunnlaugsdóttir et al., 2024).

The progressive shift from low to high anxiety across APACHE II categories indicates that physiological severity may act as a major contextual trigger for family distress. However, the relationship is unlikely to depend solely on the objective clinical score because relatives usually experience the patient's condition through information provided by physicians and nurses, direct observation of treatment, and their own interpretation of ICU technology. Communication therefore plays an important role in translating complex clinical information into an understandable explanation of prognosis and treatment goals. Reviews of ICU communication consistently emphasize that timely, structured, and comprehensible information can reduce uncertainty and improve the family experience during critical illness (Reifarth et al., 2023; Reddy et al., 2023).

Table 2. Cross-Tabulation of APACHE II Severity and Family Anxiety Levels (n = 100)

APACHE II category	No anxiety n (%)	Mild anxiety n (%)	Moderate anxiety n (%)	Severe anxiety n (%)	Total n (%)
Mild (0–9)	9 (50.0)	8 (44.4)	1 (5.6)	0 (0.0)	18 (100.0)
Moderate (10–19)	1 (1.7)	13 (22.4)	39 (67.2)	5 (8.6)	58 (100.0)
Severe (≥20)	0 (0.0)	0 (0.0)	3 (12.5)	21 (87.5)	24 (100.0)
Total	10 (10.0)	21 (21.0)	43 (43.0)	26 (26.0)	100 (100.0)

Source: Primary research data, 2026

The table demonstrates a strong descriptive dose-response pattern in which increasing APACHE II severity corresponds to progressively higher categories of family anxiety. While almost all relatives of patients with mild disease were concentrated in the no-anxiety and mild-anxiety categories, nearly nine out of ten relatives of patients with severe disease were classified as having severe anxiety. This distribution strengthens the clinical assumption that objective patient deterioration can be reflected in worsening psychological responses among family members. Systematic evidence on post-intensive care syndrome-family also identifies severe patient illness as an important predictor of later anxiety, depression, and traumatic stress among relatives (Ito et al., 2023; Shirasaki et al., 2024).

The relationship observed in this study may also be explained by the degree of exposure to complex medical interventions. Patients with severe physiological instability are more likely to require mechanical ventilation, vasoactive medication, invasive monitoring, renal replacement therapy, or other forms of organ support that may be visually distressing to family members. When such interventions are not adequately explained, relatives may interpret them as signs that the patient's condition is irreversibly worsening. Studies on family-centered care have therefore emphasized the importance of structured education and ongoing communication to help relatives understand the purpose of intensive therapies and reduce avoidable psychological distress (Schwartz et al., 2022; Bohart et al., 2024).

Another important factor is the family's involvement in treatment-related decision-making. As the patient's condition becomes more severe, family members may be required to participate in discussions concerning escalation of treatment, resuscitation, life support, prognosis, or limitations of care, particularly when the patient cannot communicate independently. These responsibilities can intensify anxiety because relatives may perceive that their decisions carry serious consequences for the patient's survival and quality of life. Evidence suggests that shared decision-making and structured communication interventions can improve understanding and psychological outcomes among families facing complex critical care decisions (Cox et al., 2024; Cheng et al., 2026).

The observed pattern also reinforces the importance of family-centered interventions for relatives of patients with moderate and severe APACHE II scores. Family engagement strategies, flexible yet structured visitation, regular clinical updates, emotional support, and opportunities to ask questions may reduce uncertainty and help relatives cope more effectively with critical illness. International evidence indicates that active family engagement and patient- and family-centered approaches can improve family experience, participation, and satisfaction with ICU care (Price et al., 2023; Duong et al., 2024). Interventions specifically designed to improve ICU communication and family satisfaction have likewise demonstrated potential value in reducing distress arising from uncertainty and insufficient information (Pena et al., 2025).

Although the descriptive findings strongly suggest that greater clinical severity is accompanied by higher family anxiety, they should not be interpreted as proof that APACHE II severity is the only determinant of psychological distress. Anxiety may also be affected by previous ICU experiences, family coping style, socioeconomic burden, relationship with the patient, health literacy, accessibility of staff, visiting conditions, and the consistency of information provided by the care team. During periods in which family access to patients is restricted, psychological burden may become even greater, emphasizing the importance of maintaining connection and communication between patients, relatives, and health professionals (Fernández-Martínez et al., 2022; Meiers et al., 2024). Therefore, the descriptive association identified here should be interpreted within the broader psychosocial and service context of intensive care.

The cross-tabulation provides strong preliminary evidence that family anxiety increases substantially as the physiological severity of the patient's condition progresses from mild to severe. The concentration of severe anxiety among relatives of patients with APACHE II scores ≥ 20 identifies this group as a priority population for early psychological assessment and targeted nursing intervention. In practice, APACHE II severity may therefore be useful not only for describing patient risk but also as a clinical cue for identifying families who may require more intensive communication, reassurance, and psychosocial support. The statistical strength and predictive importance of this relationship are examined further in the subsequent subsection using Spearman's rank correlation and ordinal logistic regression.

Statistical Association, Predictive Contribution, and Clinical Implications

The inferential analysis confirmed a statistically significant and very strong positive association between patients' APACHE II scores and family anxiety levels. Spearman's rank correlation yielded a coefficient of $\rho = 0.880$, indicating that higher severity of illness was consistently accompanied by higher anxiety scores among family members. The statistical output reported $p = 0.000$, which is conventionally interpreted as $p < 0.001$, demonstrating that the observed relationship was highly unlikely to have occurred by chance. This finding provides stronger empirical support than the descriptive cross-tabulation alone and reinforces previous evidence identifying severe critical illness as an important risk factor for psychological distress among relatives (Ito et al., 2023; Hartley et al., 2026).

The magnitude of the correlation is clinically important because a coefficient approaching 1.0 indicates a highly consistent monotonic relationship between the two variables. In practical terms, families of patients with progressively higher APACHE II scores tended to occupy progressively higher categories of anxiety, from minimal or mild symptoms toward moderate and severe anxiety. Such a pattern is consistent with the conceptual understanding that relatives respond not only to ICU admission itself but also to visible physiological deterioration, uncertainty of prognosis, and the perceived possibility of death. Similar psychological responses have been documented among

families exposed to critical illness, particularly when uncertainty, helplessness, and inadequate understanding of the patient's condition are prominent (Gurbuz & Demir, 2023; Blok et al., 2023).

The strong relationship observed in this study may be explained by the way clinical severity is experienced by family members through both direct observation and communication from health professionals. Patients with higher APACHE II scores are more likely to demonstrate unstable vital signs, impaired consciousness, organ dysfunction, and dependence on advanced life-support therapies, all of which may intensify perceptions of threat. Family members may interpret these clinical manifestations as indicators of imminent death when they lack sufficient knowledge about the purpose, reversibility, or expected duration of intensive treatments. Qualitative studies have similarly shown that relatives require timely explanations and reassurance to reduce the uncertainty associated with unfamiliar ICU environments and rapidly changing clinical conditions (Abdollahimohammad et al., 2024; Kalolo et al., 2023).

The statistical findings also support the broader framework of post-intensive care syndrome-family, in which psychological consequences may begin during the acute phase of critical illness and persist beyond ICU discharge. High anxiety during hospitalization can represent an early manifestation of a broader psychological trajectory that may later include depression, sleep disturbance, traumatic stress, and prolonged caregiver burden. The comprehensive review by Shirasaki et al. (2024) emphasizes the multidimensional nature of PICS-F, while Docherty et al. (2024) demonstrate that psychological recovery among caregivers may follow a prolonged and heterogeneous course. These findings suggest that anxiety detected during ICU admission should not be regarded as a transient emotional reaction without clinical relevance.

Ordinal logistic regression further indicated that APACHE II severity contributed substantially to the prediction of family anxiety categories. The model produced a Nagelkerke pseudo- R^2 value of 0.862, indicating that the fitted model accounted for a very large proportion of the variation in ordinal anxiety outcomes within this sample. Although pseudo- R^2 values in ordinal regression should not be interpreted identically to the R^2 statistic used in ordinary least-squares regression, the magnitude nevertheless indicates strong explanatory performance in the present dataset. The results therefore suggest that severity of illness represents a highly influential clinical marker for identifying families at increased risk of anxiety.

Table 3. Statistical Association Between APACHE II Score and Family Anxiety Level

Statistical analysis	Variable/predictor	Estimate	p-value	Model statistic	Interpretation
Spearman's rank correlation	APACHE II score vs. family anxiety	$\rho = 0.880$	<0.001	–	Very strong positive and statistically significant association
Ordinal logistic regression	APACHE II score	–	–	Nagelkerke pseudo- $R^2 = 0.862$	Strong predictive contribution to family anxiety category

Source: Primary research data, 2026

The predictive strength of APACHE II has important implications for critical care nursing because the score is routinely generated from information already available during the early phase of ICU admission. Rather than using APACHE II exclusively as a measure of patient severity, ICU teams may consider severe scores as a signal that the patient's family could also be psychologically vulnerable and require more intensive support. Early recognition could facilitate timely screening, structured communication, emotional reassurance, and referral to psychological or spiritual support when required. This approach is consistent with family-centered critical care models that emphasize proactive identification of family needs instead of waiting for severe emotional distress to become evident (Bohart et al., 2024; Gunnlaugsdóttir et al., 2024).

Communication represents one of the most modifiable elements of ICU service that may influence how families respond to severe patient illness. Regular updates delivered in understandable language can reduce uncertainty, correct misconceptions about medical devices, clarify treatment

goals, and provide realistic expectations regarding prognosis. Evidence indicates that structured family communication, shared decision-making, and deliberate family engagement can improve family experience and may reduce adverse psychological responses associated with intensive care (Cox et al., 2024; Cheng et al., 2026; Reifarh et al., 2023). Therefore, patients with high APACHE II scores should trigger not only intensified physiological surveillance but also a more structured communication pathway for their relatives.

Family-centered interventions may additionally include flexible visitation, participation in bedside discussions, opportunities to ask questions, involvement in appropriate aspects of care, and provision of written or digital educational materials. Systematic reviews indicate that such approaches can improve family participation, satisfaction, communication, and selected psychological outcomes in adult intensive care populations (Bohart et al., 2022; Duong et al., 2024; Joo et al., 2024). ICU diaries have also been investigated as a supportive intervention for reducing psychological symptoms and improving sleep-related outcomes among critically ill patients and their relatives, although their effectiveness may vary according to context and implementation (Huang et al., 2024). These findings reinforce the view that family anxiety should be addressed using a combination of clinical information, emotional support, and structured family engagement.

Nevertheless, the present results should be interpreted with appropriate methodological caution. The cross-sectional design captures the relationship between illness severity and anxiety within a limited period and therefore cannot establish temporal causality or determine whether family anxiety changes as the patient improves or deteriorates over subsequent ICU days. Furthermore, the study was conducted in a single hospital with 100 respondents, and the available model output does not permit detailed evaluation of every potential confounding factor such as socioeconomic status, prior ICU exposure, health literacy, coping style, or quality of communication. Multicenter longitudinal studies should therefore examine these variables together with repeated APACHE II and anxiety measurements to determine how family psychological responses evolve across the complete critical care trajectory.

Despite these limitations, the findings have substantial clinical relevance because they demonstrate a coherent relationship across descriptive, bivariate, and multivariable analyses. The strong correlation coefficient, the concentration of severe anxiety among families of patients with high APACHE II scores, and the large Nagelkerke pseudo- R^2 collectively indicate that physiological severity is closely linked with family psychological vulnerability in this ICU population. These results support the integration of family anxiety screening into routine critical care, particularly for relatives of patients with moderate-to-severe APACHE II scores, accompanied by structured information delivery and family-centered support strategies (Liyew et al., 2024; Padilla-Fortunatti et al., 2025; Pena et al., 2025). Accordingly, the study strengthens the evidence that high-quality ICU care should address both the physiological instability of critically ill patients and the psychological needs of the families who experience the crisis alongside them.

CONCLUSION

This study demonstrates a very strong and statistically significant positive relationship between the clinical severity of critically ill patients, as measured using the APACHE II score, and the anxiety levels experienced by their family members in the ICU of Islam Harapan Anda General Hospital, Tegal City. Most patients were classified within the moderate APACHE II category, while moderate anxiety represented the most frequent psychological response among family respondents. The cross-tabulation showed a progressive increase in anxiety as clinical severity increased, culminating in severe anxiety among 87.5% of family members of patients with severe APACHE II scores. Spearman's rank correlation further confirmed this relationship ($\rho = 0.880$; $p < 0.001$), while ordinal logistic regression demonstrated a substantial explanatory contribution of APACHE II severity to family anxiety (Nagelkerke pseudo- $R^2 = 0.862$).

These findings indicate that assessment of critically ill patients should be accompanied by systematic attention to the psychological vulnerability of their families, particularly when APACHE II scores indicate moderate or severe physiological instability. ICU nurses and other health professionals should consider integrating early anxiety screening, structured and comprehensible communication, regular clinical updates, and family-centered support into routine critical care practice. APACHE II scores may therefore serve not only as indicators of patient severity but also as useful clinical cues for

identifying families requiring more intensive psychosocial support. Future multicenter longitudinal studies are recommended to examine changes in family anxiety over time and to incorporate additional factors such as health literacy, coping strategies, socioeconomic conditions, previous ICU experience, and perceived quality of communication with health professionals.

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