

Factors Associated with Anxiety among Families of Patients in Intensive Care Unit, in Wenzhou, China^{*}

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Abstract

Purpose: This study aimed to assess anxiety levels in family members of ICU patients and determine the relationship between disease severity, social support, resilience and anxiety.

Design: Descriptive correlational research design.

Methods: A descriptive correlational study was conducted at the Second Affiliated Hospital of Wenzhou Medical University, China, involving 101 family members of patients admitted in the ICU for at least 24 hours with the following inclusion criteria: being a primary caregiver, aged over 18 years, not having a history of diagnosed mental disorders, and well literate in Mandarin. Data were collected using demographic questionnaire, Self-Rating Anxiety Scale, 14-item Resilience Scale, Social Support Rating Scale, and Acute Physiology and Chronic Health Evaluation II. Pearson product moment correlation was used to explore the relationships between anxiety and the independent variables.

Main findings: Half of family members (50.5%) exhibited mild to severe anxiety levels. Female participants exhibited significantly higher anxiety than male participants. The severity of disease was positively correlated with anxiety ($r = .40, p < .001$), while resilience ($r = -.70, p < .001$) and social support ($r = -.62, p < .001$) were negatively correlated with anxiety.

Conclusion and recommendations: Anxiety among family members of Intensive care unit patients were correlated with disease severity, social support, and resilience. These findings underscore the need for healthcare interventions that enhance resilience and social support to mitigate anxiety and improve the emotional well-being of ICU family members.

Keywords: anxiety, family members of patients in intensive care unit, resilience, severity of disease, social support

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ปัจจัยที่เกี่ยวข้องกับความวิตกกังวลของครอบครัวของผู้ป่วยในหออภิบาลผู้ป่วยวิกฤต เมืองเวินโจว ประเทศจีน*

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บทคัดย่อ

วัตถุประสงค์: การศึกษานี้มีจุดมุ่งหมายเพื่อประเมินระดับความวิตกกังวลของสมาชิกครอบครัวของผู้ป่วยในหออภิบาลผู้ป่วยวิกฤต และศึกษาความสัมพันธ์ระหว่างความรุนแรงของโรค การสนับสนุนทางสังคม ความเข้มแข็งทางใจ และความวิตกกังวล

รูปแบบการวิจัย: แบบการวิจัยเชิงบรรยายแบบหาความสัมพันธ์

วิธีดำเนินการวิจัย: การศึกษาวิจัยนี้ ดำเนินการที่โรงพยาบาลในสังกัดของมหาวิทยาลัยการแพทย์เวินโจว ประเทศจีน โดยมีผู้เข้าร่วมวิจัยเป็นญาติของผู้ป่วยที่เข้ารับการรักษาในหออภิบาลผู้ป่วยวิกฤตอย่างน้อย 24 ชั่วโมง จำนวน 101 ราย เกณฑ์การคัดเลือก ประกอบด้วย การเป็นผู้ดูแลหลัก อายุมากกว่า 18 ปี ไม่มีประวัติความผิดปกติทางจิตที่ได้รับการวินิจฉัย และอ่านเขียนภาษาจีนกลางได้ เครื่องมือที่ใช้ในการเก็บรวบรวมข้อมูล ประกอบด้วย แบบสอบถามข้อมูลประชากร แบบวัดความวิตกกังวลด้วยตนเอง แบบวัดการสร้างเสริมความเข้มแข็งทางใจ แบบวัดการสนับสนุนทางสังคม และแบบประเมินความรุนแรงของโรค วิเคราะห์ข้อมูลโดยใช้สัมประสิทธิ์สหสัมพันธ์ของเพียร์สัน เพื่อศึกษาความสัมพันธ์ระหว่างความวิตกกังวลกับตัวแปรอิสระ

ผลการวิจัย: สมาชิกในครอบครัวมีระดับความวิตกกังวลในระดับน้อย ปานกลาง และรุนแรง รวม 50.5% กลุ่มตัวอย่างเพศหญิงมีความวิตกกังวลสูงกว่าเพศชายอย่างมีนัยสำคัญ ความรุนแรงของโรคมีความสัมพันธ์ทางบวกกับความวิตกกังวล ($r = .40, p < .001$) ในขณะที่ความเข้มแข็งทางใจ ($r = -.70, p < .001$) และการสนับสนุนทางสังคม ($r = -.62, p < .001$) มีความสัมพันธ์ทางลบกับความวิตกกังวล

สรุปและข้อเสนอแนะ: ความวิตกกังวลของสมาชิกครอบครัวของผู้ป่วยในหออภิบาลผู้ป่วยวิกฤตมีความสัมพันธ์กับความรุนแรงของโรค การสนับสนุนทางสังคม และความเข้มแข็งทางใจ ผลการศึกษาเหล่านี้เน้นถึงความจำเป็นของการจัดกิจกรรมการดูแลสุขภาพที่ช่วยเสริมความเข้มแข็งทางใจและการสนับสนุนทางสังคม เพื่อลดความวิตกกังวลและปรับปรุงสุขภาวะทางอารมณ์ของสมาชิกครอบครัวของผู้ป่วยในหออภิบาลผู้ป่วยวิกฤต

คำสำคัญ: ความวิตกกังวล สมาชิกครอบครัวของผู้ป่วยในหออภิบาลผู้ป่วยวิกฤต ความเข้มแข็งทางใจ ความรุนแรงของโรค การสนับสนุนทางสังคม

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Background and Significance

Intensive care units (ICUs) are high-stakes environments where patients receive life-sustaining treatments, yet family members often experience profound psychological distress.¹ Despite improved ICU survival rates, with nearly 85% of ICU patients being discharged alive², family caregivers face emotional turmoil due to sudden admissions, prognostic uncertainty, and complex medical environments.³ Anxiety affects 34-70% of ICU family members globally, with rates as high as 69.1% in China.⁴⁻⁵ Persistent anxiety can impair caregiving capacity and long-term mental health.⁶ These challenges contribute to heightened psychological distress, particularly anxiety and stress.⁷

Empirical research indicates that ICU family members frequently experience significant psychological distress. Studies have shown that up to 70% report anxiety symptoms, while 35% exhibit signs of depression.⁴ Research in Brazil found that 34% of ICU family members experienced anxiety during hospitalization⁸, while Bandari, et al.⁹ reported a higher prevalence of 52%. These high levels of anxiety not only affect the well-being of family members but also hinder their ability to provide emotional and practical support for patient recovery.¹⁰ According to the literature review, anxiety in ICU patient's family members can be affected by many factors.

The severity of illness, often assessed using scoring systems such as APACHE II, has been linked to family anxiety levels.¹¹ Prolonged mechanical

ventilation, metastatic disease, and progressive conditions have all been associated with increased anxiety among family members.¹² However, some studies have found no significant association between disease severity and family anxiety, suggesting the need for further exploration.¹³

Resilience, defined as the capacity to adapt to and recover from adversity, plays a vital role in mitigating psychological distress in ICU settings.¹⁴ Bonanno¹⁵ conceptualized resilience as the ability to maintain emotional balance despite stressful experiences. Research has demonstrated that higher resilience is associated with lower anxiety levels in family members¹⁶ and serves as a protective factor against acute psychological distress.¹⁷

Social support is another significant determinant of anxiety levels among ICU family members. Defined as psychological and material assistance provided by social networks to help individuals cope with stress¹⁸, social support has been found to reduce anxiety and enhance emotional stability in ICU settings. Studies have demonstrated that social support interventions can significantly lower anxiety levels by helping family members reframe stressful situations and build emotional resilience.¹⁹⁻²⁰

Cultural factors also shape the influence of social support on family anxiety. Unlike Western cultures, which emphasize individualism, Chinese culture places strong emphasis on familial obligations and kinship-based caregiving.²¹ The nature of the family relationship (whether the

caregiver is a spouse, child, or sibling can significantly influence the emotional response to an ICU hospitalization. The cultural expectations surrounding caregiving roles may contribute to variations in anxiety levels among different family members.

While research has examined anxiety levels among ICU family members in China, few studies have investigated the interplay between patient condition, family resilience, and social support. Additionally, research on the resilience of ICU family members in Wenzhou remains limited. This study aims to assess the anxiety levels of ICU family members in Wenzhou, China, and examine the relationships between disease severity, resilience, and social support in predicting family anxiety. The results of this study would be enhanced medical staff's awareness of their psychological needs while offering evidence-based insights for developing effective interventions, specifically through enhancing resilience and refining social support systems, to elevate the mental health of patients' families.

Objectives

1. To assess the anxiety level in family members among ICU patients in Wenzhou, China.
2. To determine the relationship between anxiety and severity of disease, resilience, social support in family members among ICU patients in Wenzhou, China.

Research Hypotheses

Anxiety correlates positively with disease severity and negatively with resilience and social support.

Methodology

The participants in this descriptive correlational research design consisted of 101 family members of ICU patients at the Second Affiliated Hospital of WMU in Wenzhou, China. The inclusion criteria for participation in this study were as follows: 1) being a primary caregiver of a patient who was in the ICU for at least 24 hours; 2) aged over 18 years; 3) not having a history of diagnosis with psychological disorders; 4) well literate in Mandarin.

Population and sample

The sample size was determined using G*Power 3.1.9.2 software, which indicated that 84 participants were required to detect a moderate effect size (0.3) with a significance level of .05 and a statistical power of .80.²² To account for potential incomplete data, the sample size was increased by 20%, resulting in a total of 101 participants.

Sampling technique

Simple random sampling was employed to recruit participants. Register the family members of ICU patients who meet the eligibility criteria, fold their numbering into small notes, and then the researcher randomly drew the noted to select participants. After obtaining consent from the patients' family members, they were invited to participate in the study. Informed consent was obtained from each participant before data collection.

Simple random sampling was employed to recruit participants. The family members of ICU patients who met the eligibility criteria were registered, and their assigned numbers were written on small slips of paper. The research then randomly drew the slips to select participants. After obtaining consent from the selected family members, they were invited to participate in the study. Informed consent was obtained from each participant before data collection.

Research instruments

The demographic questionnaire, developed by the researchers, was used to collect basic data about the participants, including their age, gender, relationship to the patient, educational background, occupation, marital status, living status, and the length of the patient's stay in the ICU.

The Acute Physiology and Chronic Health Evaluation (APACHE II) was used to assess the severity of the patient's illness on the first day of ICU admission.²³ A higher score indicates a greater critical condition of the patient. This score combines acute physiological variables, the patient's age, and the presence of chronic conditions, with parameters such as body temperature, blood pressure, oxygen levels, serum chemistry, and Glasgow Coma Scale (GCS) scores contributing to the overall score. Clinical information (APACHE score) was retrieved from patients' charts.

The Self-rating Anxiety Scale (SAS), developed in 1971, is a widely used instrument to measure anxiety symptoms.²⁴ It consists of 20 items that reflect both somatic and affective symptoms of

anxiety, such as feelings of nervousness, fear, and physical sensations like shaking or rapid heartbeat. Participants rate how often they experience these symptoms on a four-point rating scale. Index scores falling within the range of 50-59 points are indicative of mild anxiety. Scores ranging from 60-69 points suggest the presence of moderate anxiety, while scores exceeding 70 points denote severe anxiety.

The Social Support Rating Scale (SSRS)²⁵, a widely used tool in China, measures the level of social support in three areas: objective support, subjective support, and social support utilization. It consists of 10 items, with a higher total score reflecting a higher level of perceived social support. The scale includes questions related to the availability of help in times of need, the family member's relationships with others, and their participation in social or support activities.

The 14-item Resilience Scale (RS-14)²⁶ was used to assess family members' resilience. This scale uses a 7-point Likert-type scale to measure characteristics such as perseverance, self-reliance, and equanimity, with a higher score indicating a greater resilience.

Reliability of the instruments in this study

To assess the reliability of all the questionnaires a group of 30 individuals whose attributes were comparable to the target demographic was recruited. Cronbach's alpha was computed to determine the internal consistency of three specific measurement scales in Chinese versions: SAS, SSRS, and RS-14; and the reliabilities were .84, .80, and .89, respectively.

Ethical considerations

This study received ethical approval from Burapha University's Human Research Ethics Board (IRB3-098/2565), dated October 10, 2022.

This study adhered to ethical guidelines to ensure the protection of human subjects. Participants were informed of the study's objectives, the voluntary nature of participation, and their right to withdraw at any time without consequence. Written informed consent was obtained from all participants. The confidentiality of the participants was strictly maintained, with no identifying information being disclosed. All paper documents containing personal data were securely stored, and data were only used for research purposes.

Data Collection

The data collection process took place during the family members' waiting times in the ICU (from September 2023 to October 2023), approximately 20-30 minutes to complete the self-administered questionnaires typically when waiting for doctors' rounds, to minimize disruption to their routine. Data were collected from Monday through Friday during two time slots: in the morning from 9:00 to 11:00 am, and in the afternoon from 3:00 to 5:00 pm. Approximately 5-8 participants were recruited each day until the target sample size was reached.

Data Analysis

Data were analyzed using SPSS 27 statistical software to summarize demographic characteristics, anxiety levels, severity of disease, resilience, and social support. Pearson's product-moment correlation

coefficient was used to examine the relationships between anxiety levels and each of the independent variables: severity of disease, resilience, and social support. The significance level was set at .05.

Findings

1. General Information

A total of 101 family members of ICU patients participated in the study. Of these, 51.5% were female ($n = 52$), and 48.5% were male ($n = 49$). The participants' ages ranged from 20 to 70 years, with a mean age of 44.37 years ($SD = 12.30$). According to the World Health Organization's classification, 54.4% of participants were categorized as young (≤ 45 years), 32.7% as middle-aged (46-60 years), and 12.9% as elderly (> 60 years). In terms of education, the majority of participants had completed junior high school (31.7%) or held a bachelor's degree (28.7%).

Most participants were married (79.2%); and 73.7% were employed while 26.7% did not work at the time of the study. Regarding the relationship to the ICU patients, the largest proportion were young age < 45 years old (54.5%), followed by spouses (21.8%). As for living arrangements, 57.4% of participants lived in urban areas, and 42.6% resided in rural areas. The length of the ICU stay varied with the mean length of stay 2.78 days ($SD = 1.20$).

2. Description of anxiety

Anxiety levels were measured using the Self-rating Anxiety Scale (SAS). The classification and descriptive statistics of anxiety levels are shown in Table 1.

Table 1: Range, number, percentages, mean, standard deviation of self-rating anxiety in family members of ICU patients (N = 101)

Range		Number	Percentage	$\bar{X}$	SD	Level
Possible range	Actual range					
25-50	26-48	50	49.5	38.60	5.79	normal
50-59	50-57	37	36.6	52.46	2.60	mild
60-69	60-66	12	11.9	63.08	2.23	moderate
70-100	70-72	2	2.0	71.00	1.41	severe

The results revealed that 49.5% of participants had a SAS score indicating no anxiety ($\bar{X} = 38.6$, $SD = 5.79$). Among these, 36.6% reported mild anxiety ($\bar{X} = 52.46$, $SD = 2.60$), 11.9% experienced moderate anxiety ($\bar{X} = 63.08$, $SD = 2.23$), and 2% exhibited

severe anxiety ($\bar{X} = 71$, $SD = 1.41$).

3. Description of selected factors

Descriptive statistics of factors related to anxiety including severity of disease, social support, and resilience were presented in Table 2.

Table 2: Ranges, means, frequencies, and standard deviation of the variables (N = 101)

Variables	Range score		$\bar{X}$	SD
	Possible score	Actual score		
APACHE II	0-71	13-41	23.52	7.59
SSRS	10-40	17-37	26.74	4.65
RS-14	14-98	31-93	71.21	11.90

The APACHE II score, which ranges from 13 to 41, had a mean of 23.52 ($SD = 7.18$), indicating a moderate severity of illness in the sample. Social support, as measured by the SSRS, ranged from 17 to 37, with a mean score of 26.74 ($SD = 4.65$), reflecting a moderate level of perceived social support. The resilience scores ranged from 31 to 93, with a mean of 71.21 ($SD = 11.90$), suggesting that the family members generally reported a high level of resilience.

4. The relationship between the factors and anxiety among family members of patients in ICU

To examine the relationships between anxiety and three variables--disease severity, social support, and resilience--among family members of patients admitted to the ICU, Pearson's correlation coefficient was employed as shown in Table 3. This statistical technique is appropriate for assessing the strength and direction of linear relationships between continuous variable. All variables were normally distributed, as confirmed by a P-P plot.

Table 3: Correlation coefficients between anxiety and disease severity, social support, and resilience among family members of ICU patients (N = 101)

Variables	Anxiety	Severity of disease	Social support	Resilience
Anxiety	1			
Severity of disease	.40**	1		
Social support	- .62**	- .30**	1	
Resilience	- .70**	- .35**	- .73**	1

**p < .001

The analysis revealed that the severity of disease, as indicated by the APACHE II score, had a moderate positive correlation with anxiety ($r = .40$, $p < .001$), suggesting that higher disease severity was associated with higher anxiety among family members. Conversely, both social support and resilience were negatively correlated with anxiety ($r = -.62$, $p < .001$; and $r = -.70$, $p < .001$, respectively). The results suggest that family members with higher social support and higher resilience would experience lower anxiety.

Discussions

This study examined the anxiety levels experienced by family members of ICU patients and explored the relationships between anxiety and key factors including disease severity, resilience, and social support. The findings provide valuable insights into the emotional strain endured by ICU families and highlight factors that influence their anxiety.

The results confirm that the hospitalization of a loved one in an ICU has a profound psychological impact on family members, often resulting in heightened anxiety. In this study, over half (50.5%) of participants experienced anxiety, a prevalence rate

slightly higher than previous studies conducted in China. These findings align with international research indicating that ICU family members frequently experience anxiety and depression.²⁷ While most participants reported mild anxiety (36.6%), a smaller proportion exhibited moderate (11.9%) and severe anxiety (2%). These figures emphasize the significant mental health burden associated with the uncertainty of a patient's condition and the demands of a caregiving role.

The findings revealed a significant positive correlation between disease severity and anxiety levels, suggesting that as a patient's condition worsens, family members experience greater emotional distress. This result was consistent with previous studies linking disease severity to psychological distress in family caregivers.²⁸ However, some research suggests no significant relationship between disease severity and family anxiety²⁹, highlighting potential differences in cultural contexts and healthcare support systems. For example, in societies with strong family bonds, such as China, worsening patient conditions may exert a greater emotional toll on family members. Conversely, in healthcare systems

where external support is more readily available, family members may receive psychological and informational support that mitigates anxiety.

Social support was found to have a significant negative correlation with anxiety, indicating that greater social support is associated with lower anxiety levels. This finding is consistent with prior research demonstrating that emotional and practical support from family, friends, and healthcare professionals can help reduce psychological distress among caregivers.³⁰⁻³¹ Similarly, a study conducted in China found that caregivers who received higher levels of social support reported lower anxiety.³² However, cultural differences may affect how social support influences anxiety. For instance, Chinese cultural norms emphasize familial obligations, which may lead some family members to conceal their emotional distress to avoid burdening others.³³ This underscores the need for culturally sensitive interventions that encourage open communication and promote emotional well-being among ICU family members.

Resilience was also negatively correlated with anxiety, indicating that individuals with higher resilience levels experienced lower psychological distress. This finding aligns with existing research demonstrating that resilience plays a protective role in managing stress among caregivers.¹⁵ Aligned with the hypothesis proposed in this study, Resilience in family members may be fostered by factors such as positive coping strategies, strong family support networks, and the ability to find meaning in caregiving experiences.

Conclusion and Recommendations

This research has made a meaningful addition to the expanding corpus of studies focusing on the psychological distress encountered by family kin of ICU-admitted patients. The results indicate that anxiety constitutes a widespread concern among the family members of patients in the ICU and is influenced by factors, including disease severity, social support, and resilience.

Medical practitioners ought to be cognizant of the psychological strain experienced by family members and implement strategies to support their psychological well-being. ICU healthcare teams should consider incorporating family-centered interventions that actively enhance both social support and psychological resilience. Targeted strategies not only improve the emotional well-being of families but may also enhance their ability to participate in shared decision-making and support patient care trajectories in critical care settings, help reduce anxiety and improve the overall experience of family members during their loved one's ICU stay.

Suggestion for Further Study

Future research should further investigate the complex interplay between resilience, coping mechanisms, and cultural influences in shaping the emotional responses of ICU families. Longitudinal studies examining the long-term psychological impact of ICU experiences would provide deeper insights into how family members adapt over time and inform the development of more effective support interventions.

Limitations

While this study provides valuable insights into the anxiety experienced by family members of ICU patients, certain limitations must be acknowledged. The cross-sectional design limits the ability to establish causality between anxiety and the examined factors. Additionally, this study focused on descriptive relationships between anxiety and key variables, but other psychological and contextual factors may also contribute to family members' distress. Furthermore, while this study identifies the significant role of social support and psychological resilience in mitigating anxiety, additional research is needed to assess the effectiveness of targeted interventions based on these findings.

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