

ADDIS ABABA UNIVERSITY

TIKUR ANBESSA SPECIALIZED HOSPITAL

COLLEGE OF HEALTH SCIENCE

Psychological Outcomes and Coping Mechanisms in Parents of Critically Ill Children Admitted in PICU at TASH: Hospital Based Cross-sectional Study, 2025/26

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List of abbreviations/ acronyms

CI-Confidence Intervals

AAU- Addis Ababa university

PI - Principal Investigator

PICU- Pediatrics Intensive Care Unit.

TASH- Tikur Anbessa Specialized Hospital

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Summary

Background: Parents of critically ill children admitted to the Pediatric Intensive Care Unit (PICU) often experience high levels of psychological distress, including anxiety, depression, and stress. These psychological outcomes not only affect parental well-being but also influence the child's recovery and family functioning. Despite the critical impact, limited data exists from Ethiopia on the psychological burden faced by parents of PICU patients.

Objectives: To assess the psychological outcomes (anxiety, depression, and stress) and coping mechanism of parents of critically ill children admitted to the PICU at Tikur Anbessa Specialized Hospital (TASH), Addis Ababa University, Ethiopia, and to identify associated factors.

Methods: A hospital-based cross-sectional study was conducted from September 2025 to February 2026. A total of 83 parents of children admitted to the PICU was prosepctively enrolled. Data was collected using a structured questionnaire, including the validated Depression, Anxiety, and Stress Scale (DASS-21). Socio-demographic and clinical variables were assessed. Outcomes were measured as magnitudes and severity of anxiety, depression, and stress. Data was entered and analyzed using R software. Descriptive statistics, frequency tables, and graphs were used for summary, while logistic regression was used to identify factors associated with adverse psychological outcomes.

Results: In a study of 83 parents in the Pediatric Intensive Care Unit, 68.7% exhibited poor psychological outcomes, characterized by high rates of depression and anxiety. Multivariate analysis revealed that mechanical ventilation, surgical interventions, and shorter durations of stay were significant independent predictors of increased parental distress. Parents primarily utilized emotion-focused coping mechanisms, though many also employed dysfunctional strategies that could potentially exacerbate their psychological burden. The study concludes that intensive medical procedures significantly heighten emotional trauma, highlighting a critical need for early psychological screening and intervention.

Conclusion: Integrating dedicated psychosocial support services into the PICU is essential to safeguard the mental health and resilience of families.

Keywords: Depression, anxiety, stress, parents, PICU, hospitalized, child

1. Introduction

1.1 Background

The Pediatric Intensive Care Unit (PICU) offers specialized, high-quality care to critically ill and vulnerable children, managing life-threatening dysfunctions of vital organs. While medical and technological advancements have greatly improved survival rates for these children, survival does not eliminate the deep psychological and emotional impacts experienced by their families(1,2). The growing focus on family-centered care in pediatric settings, while empowering families to be part of decision-making, also brings them more directly into the stressors and emotional challenges of critical care environments(1,4).

The PICU is recognized as a high-stress environment not only for patients and healthcare providers but also for parents and family members. Studies consistently show that parents of children admitted to PICUs experience significant psychological distress. The unexpectedness of admission, the need for quick decision-making, and the helplessness of watching a critically ill child can cause intense emotional distress. Parents often describe feelings of fear, insecurity, concern, uncertainty, despair, helplessness, anger, powerlessness, and guilt, frequently losing their sense of control over their parental role(1,4,5)

Parents of critically ill children often exhibit high levels of psychological distress, manifesting as stress, anxiety, and depression. These emotions are intensified by the uncertainty and severity of their child's condition, as well as the invasive nature of medical interventions.

Stress is a common psychological outcome. Parents experience multiple sources of stress during hospitalization of their child in paediatric intensive care unit (PICU), related to the child's health condition, physical appearance, painful procedures, uncertainty of recovery, sights and sounds of the environment, and alteration of parental role (6,7) Mothers and fathers frequently report feeling overwhelmed by the emotional and practical challenges of caregiving, which can persist long after the child leaves the hospital (7).

Anxiety is another prevalent psychological outcome, particularly during the early stages of hospitalization. Parents often express fears regarding their child's prognosis, treatment effectiveness, and potential long-term consequences of the illness. Research indicates that anxiety levels remain elevated for many parents, even after their child's condition stabilizes(8,9).

Depression is a significant psychological outcome, with the emotional toll of a child's illness combined with family life disruption leading to sadness, hopelessness, and loss of control. Studies indicate that mothers, in particular, are at a higher risk of experiencing depressive symptoms compared to fathers, though both genders are affected(5,9)

Psychological distress persists in 35.2% to 64.3% of family members 3 to 6 months post-discharge, and in 40.9% to 53% one year after. Moderate to severe anxiety and depression have been observed in 20.9% to 42% and 6.1% to 42.6% of parents, respectively. Despite this high prevalence, mental health service utilization among affected parents remains low, ranging from 0.7% to 29% (9).

While immediate hospitalization stress has received some attention, less is known about how families cope in the months and years following a PICU stay. Many families do not receive ongoing aftercare services, and the long-term psychological burden can disrupt family functioning and daily routines. Risk factors for developing psychiatric issues include being a mother, caring for a younger child, and experiencing a prolonged PICU stay (10,11) In Ethiopia, a retrospective study from Gondar University Hospital reported a 30.9% overall PICU mortality rate, with neurological, infectious, and renal conditions as leading causes of admission; however, the psychological impact on parents was not assessed, highlighting a major research gap (12)

Given the profound and often lasting psychological impact of a child's critical illness on parents, this study aims to explore the psychological outcomes among parents of children admitted to the PICU at Tikur Anbessa Specialized Hospital. Specifically, it seeks to understand how parents experience and handle the period following their child's critical illness to help improve future support systems and mental health interventions.

1.2 Statement of the Problem

While the primary focus often stays on the clinical outcomes of critically ill children, the emotional and psychological well-being of their parents is often overlooked. At Tikur Anbessa Specialized Hospital (TASH), Ethiopia's largest referral hospital, there is a significant lack of data and organized psychosocial support for parents in the PICU. This gap in knowledge and support is vital because the psychological distress experienced by parents can have lasting effects on family functioning and the child's recovery. Understanding these specific psychological outcomes is essential for providing comprehensive care. This study aims to establish baseline data on the mental health of parents with children admitted to the PICU at TASH, which is currently unavailable.

1.3 Significance of the Study

This study is significant for several key reasons. It provides essential data on the magnitudes of psychological outcomes such as stress, anxiety, and depression among parents of critically ill children in TASH, Addis Ababa. This information helps identify the scope of the problem and informs the development of targeted mental health interventions to support affected parents.

The findings will also guide hospital policies by advocating for the integration of psychosocial support into family-centered pediatric care. Additionally, the study establishes much-needed baseline data for future research on parental mental health in the Ethiopian context. Ultimately, by addressing parental psychological well-being, the study contributes to improved family functioning and potentially better recovery outcomes for the children.

2. Literature Review

2.1 Overview of Parental Psychological Outcomes Post-PICU

The hospitalization of a child in a Pediatric Intensive Care Unit (PICU) is a profoundly distressing experience for parents. Psychological effects such as stress, anxiety, and depression are frequently reported among parents, with some studies indicating persistence of these symptoms well beyond discharge (1,2,4).

Evidence shows that approximately 24% of parents report severe anxiety, while more than half (51%) present with depressive symptoms indicative of major depression. In addition, around 26% of parents experience significant decisional conflict during the hospitalization period.

Several factors contribute to these adverse outcomes, including the severity of the child's illness, uncertainty of prognosis, exposure to invasive procedures, environmental stressors in the PICU, and disruptions to parental roles. Sleep disturbances and irregular sleep patterns further exacerbate psychological distress, whereas strong social support consistently emerges as a protective factor across different studies (1,2,4)

Moreover, parents of PICU patients are at risk of developing post-traumatic stress symptoms, which may persist long after discharge. These findings underscore the importance of early identification of at-risk parents, routine psychological screening, and the provision of psychosocial interventions to mitigate long-term consequences and promote overall family well-being (13)

2.2 Prevalence and Persistence of Distress

Multiple studies highlight the substantial psychological burden experienced by families following PICU admission. A cross-sectional study comparing PICU patients and their parents with ward controls found that 38% of PICU children scored in the high or very high range for total difficulties on the SDQ at six weeks, compared with only 8% of ward children. At six months, 28% of PICU children continued to show elevated difficulties, with emotional symptoms being the most affected domain. Parental outcomes were also concerning, with 12% reporting abnormal depression scores and 14% abnormal anxiety scores, significantly higher than the ward group. Predictors of adverse outcomes included multiple prior admissions, greater

illness severity, and invasive procedures, underscoring the persistent psychological impact of PICU admission on both children and parents (8).

A meta-analysis of 22 studies, encompassing 55,597 patients and 97,506 family members, further confirmed the high prevalence of psychological morbidity among families of PICU survivors. Between 35.2% and 64.3% of family members reported psychological distress within 3 to 6 months after admission, and 40.9% to 53% continued to do so at one year. Post-traumatic stress disorder (PTSD) was diagnosed in 10% to 48% of parents, while 20.9% to 42% experienced moderate to severe anxiety and 6.1% to 42.6% reported depressive symptoms within 3 to 6 months. Despite this, the uptake of counseling services remained disproportionately low (0.7%–29%). Risk factors identified included being a mother, caring for younger children, and longer PICU stays(9)

While these findings provide strong evidence from high- and middle-income countries, there remains a striking lack of data from Africa, including Ethiopia. In low-resource settings, where mental health services are limited and psychosocial support underdeveloped, the true prevalence may be underestimated. Local evidence is therefore crucial to guide targeted interventions, improve parental support, and inform policy within the Ethiopian and African context.

2.3 Gender Differences and Family Functioning

Multiple studies reveal that mothers generally report higher levels of distress than fathers (2,9) Evidence indicates notable gender differences in parental psychological outcomes following a child's critical illness. A national prospective longitudinal study conducted 8 PICUs in Switzerland observed that mothers of chronically critically ill children experienced marked emotional strain and family dysfunction, which often worsened over time without psychosocial support (7)

In contrast, a systematic review from 24 published articles revealed that fathers also faced substantial psychological challenges, including anxiety, helplessness, and post-discharge depressive symptoms, though these were frequently under-recognized and tended to emerge later. Both studies underscore the importance of gender-sensitive and family-focused interventions to address the differing psychosocial needs of mothers and fathers (14)

2.4 Risk Factors Influencing Psychological Outcomes

Several key risk factors contribute to the psychological distress experienced by parents of critically ill children admitted to the Pediatric Intensive Care Unit (PICU). These factors can be broadly categorized into parental, child-related, environmental, and psychosocial domains.

Parental characteristics play a significant role in determining the level of psychological burden. Research consistently shows that mothers are particularly vulnerable, often reporting higher levels of stress, anxiety, and depressive symptoms compared to fathers. Additional parental factors such as younger age, lower educational attainment, low income, and a history of adverse childhood experiences (ACEs) have been strongly associated with increased psychological distress during and after their child's PICU admission (15) These characteristics may influence parents' resilience and coping capacity, as well as their ability to navigate complex healthcare environments.

Child-related factors are equally influential. The age of the child particularly being very young has been linked with heightened parental anxiety. Poor medical prognosis and longer durations of PICU hospitalization further intensify emotional trauma for parents, as they endure extended periods of uncertainty, fear, and helplessness (1,2,7). These conditions often correlate with more invasive interventions, increasing the emotional toll on families.

Environmental factors within the PICU setting can exacerbate parental stress. Constant exposure to alarms, complex medical equipment, and invasive procedures can be overwhelming. In addition, poor communication between healthcare providers and families, limited opportunity for parental presence or participation in care, and insufficient updates on the child's condition contribute to heightened anxiety and loss of control (9,15) The environment, often cold and clinical, may contrast sharply with parents' need for comfort, clarity, and inclusion.

Psychosocial factors are also critical determinants. Parents with a prior history of mental health issues are at greater risk of experiencing intense psychological responses during their child's critical illness. Lack of effective coping strategies and weak social support systems further amplify distress, limiting the availability of emotional outlets or practical assistance during the hospitalization period (7,8,16). These psychosocial vulnerabilities often persist beyond discharge, affecting family functioning and overall well-being.

Collectively, these findings underscore the importance of early screening and personalized support strategies that consider the diverse risk profiles of parents in PICU settings. Addressing these risk factors holistically is essential for promoting long-term psychological resilience in families facing pediatric critical illness.

2.5 Protective Factors and Coping Mechanisms

The study found that primary caregivers of children admitted to the PICU primarily used emotion-focused coping strategies (44%), followed by problem-focused coping (37%) and avoidant coping (19%). Among specific strategies, emotional support (6.38 ± 1.16) and religion/spirituality (6.34 ± 0.98) were the most frequently employed, whereas substance abuse (2.12 ± 0.45) and humor (2.00 ± 0.00) were the least used. These findings align with previous

research indicating that caregivers often rely on emotional and religious coping mechanisms, while ineffective or dysfunctional coping strategies are less common. Recognizing these patterns is crucial for healthcare professionals to provide timely guidance and support, enabling caregivers to manage stress and maintain psychological balance during their child's PICU hospitalization (17)

Parents of critically ill children in the PICU experience high levels of stress due to factors such as disease uncertainty, severity of illness, treatment procedures, and limited access to healthcare. Studies show that parents employ a combination of emotion-focused coping (e.g., prayer, acceptance, emotional expression), problem-focused coping (e.g., seeking support, active participation in care), and avoidant or negative coping (e.g., denial, self-blame). Interventions such as the COPE program, which provide early education, emotional support, and opportunities for active involvement in the child's care, have been shown to improve parental coping, reduce stress and negative mood, and positively influence child behavioral outcomes. These findings highlight the importance of supporting adaptive coping strategies to mitigate stress and enhance both parental and child psychosocial well-being in the PICU (17–19)

2.6 Psychological Screening and Early Intervention

Parents of children admitted to the PICU are at increased risk of psychological difficulties, including anxiety, depression, and posttraumatic stress. Evidence suggests that psychological screening can help identify parents at high risk, enabling targeted support, although effective follow-up interventions remain limited. Studies highlight that early intervention and family-centered psychosocial support are essential to address parental stressors, including lack of information, long-term psychosocial impacts, and reliance on coping strategies such as spirituality. Integrating systematic screening and structured interventions into PICU care can help mitigate long-term psychological burdens and improve outcomes for both parents and children (20–22)

2.7. Conceptual Framework

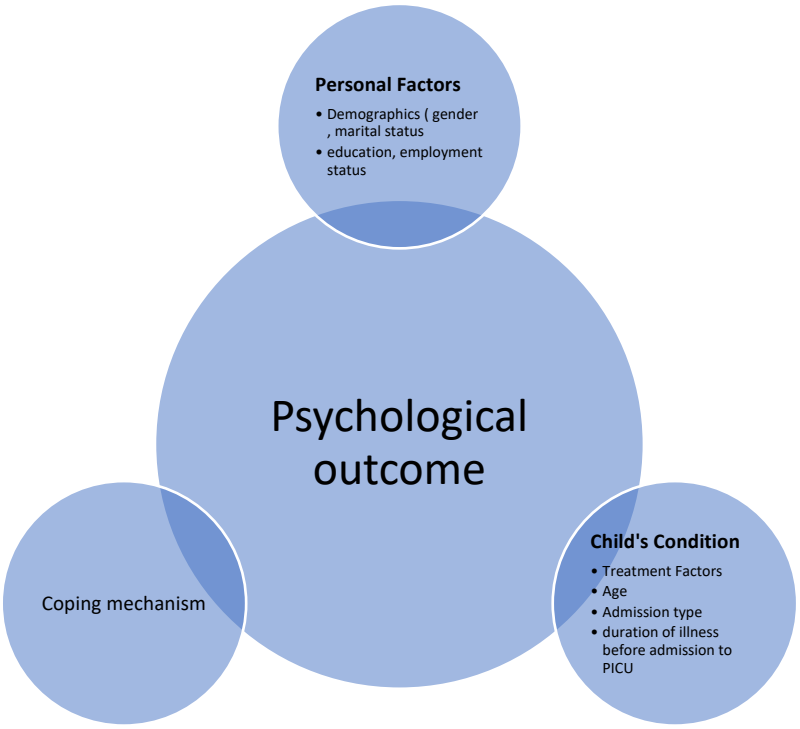


Figure 1: Conceptual Framework

2.8. Assessment Tools for Measuring Psychological Outcomes and Coping Mechanisms

Assessment of psychological outcomes and coping mechanisms among parents of critically ill children has commonly utilized standardized tools to measure emotional distress and adaptive responses. The Depression, Anxiety and Stress Scale–21 items (DASS-21) is widely applied for evaluating depression, anxiety, and stress with high reliability(23). Similarly, the Hospital Anxiety and Depression Scale (HADS) and the Impact of Event Scale–Revised (IES-R) assess symptoms of anxiety, depression, and post-traumatic stress in parents experiencing their child's critical illness (24). The Parental Stressor Scale: Pediatric Intensive Care Unit (PSS: PICU) targets stressors unique to the PICU environment, while coping mechanisms are often assessed using the Brief COPE Inventory and the Coping Health Inventory for Parents (CHIP) to identify adaptive and maladaptive coping strategies(25,26). Together, these tools offer comprehensive insight into parental psychological burden, supporting culturally tailored interventions in pediatric critical care.

Recent studies highlight the burden of psychological distress among caregivers using DASS-21 and Brief COPE. In one study of parents of children with chronic conditions such as congenital heart disease and cancer, 26% exhibited moderate-to-severe depression, 38% moderate-to-severe anxiety, and 40% moderate-to-severe stress (27). In Ethiopia, a cross-sectional study among caregivers of children with cancer found 33.6% experienced psychological distress, including 13.3% with severe symptoms(28). Similarly, a study among perinatal bereaved mothers in southwest Ethiopia using the Brief COPE reported that 55.4% adopted positive coping strategies such as active coping and acceptance (29). These findings suggest that approximately one-third of caregivers may experience significant psychological distress, while more than half employ adaptive coping approaches, emphasizing the need for early psychological screening and culturally sensitive support among parents of critically ill children.

3. Objectives

3.1 General objective

To assess the psychological outcomes of parents of critically ill children admitted to the PICU in Tikur Anbessa Specialized Hospital, Addis Ababa, in 2025/26.

3.2 Specific Objectives

1. To determine the magnitude of stress, anxiety, and depression among parents of critically ill children admitted to the PICU.
2. To identify factors associated with poor psychological outcomes among parents of critically ill children admitted to the PICU.
3. To assess the coping mechanisms of parents following their child's admission to the PICU.

4. Method

4.1 Study Design

A hospital-based cross-sectional study was conducted to assess the psychological outcomes including stress, anxiety, and depression among parents or primary caregivers of critically ill children admitted to the Pediatric Intensive Care Unit (PICU) at Tikur Anbessa Specialized Hospital (TASH), Addis Ababa, Ethiopia.

4.2 Study Area and Period

The study was conducted in the PICU of Tikur Anbessa Specialized Hospital (TASH), the largest referral and teaching hospital in Ethiopia, located in Addis Ababa. The data collection period was from September 25/2025 to February 25, 2026.

4.3 Study Population

The study population includes parents or legal guardians (both mothers and fathers) of critically ill children aged 1 month to 15 years who are admitted to the PICU for at least 48 hours**.**

Inclusion Criteria

- Parents/legal guardians of children admitted to the PICU for ≥ 48 hours
- Aged ≥18 years
- Willing to provide written informed consent

Exclusion Criteria

- Parents with a known pre-existing psychiatric illness documented in medical records
- Parents who decline to participate

4.4 Sample Size Determination

The sample size was calculated using the single population proportion formula:

$$n = \frac{Z^2 \cdot p \cdot q}{d^2}$$

Where:

- Z=1.96Z = 1.96Z=1.96 for 95% confidence
- p=0.5p = 0.5p=0.5, assumed prevalence due to lack of prior data
- d=0.05d = 0.05d=0.05, margin of error
- q=1−p=0.5q = 1 - p = 0.5q=1−p=0.5

$$n = \frac{(1.96)^2 \cdot 0.5 \cdot 0.5}{(0.05)^2} = 384$$

Since the total population (N = 105) is less than 10,000, the sample size was adjusted using the finite population correction formula: n’ = n/(1+(n/N))

where n’ is the adjusted sample size,

n is the minimum sample size,

and N is the total population.

$$n' = 384/(1+(384/105)) = 82$$

To increase statistical power and account for potential non-response, then, by adding a 10% contingency, the final sample size will be 90.

4.5 Sampling Technique

A consecutive sampling technique was employed since our sample size is small.

4.6. Study Variables

4.6.1 Dependent variable;

Psychological Outcomes (DASS21) Anxiety
Depression
Stress

4.6.2 Independent Variables :

Parent Characteristics: Gender, marital status, education, employment status,income
Child Characteristics: Age, sex, duration of illness before admission to PICU, length of stay at PICU, mechanical ventilation, and surgery
Coping mechanism (brief COPE)

4.6.3 Operational Definition of Psychological Outcome

In this study, psychological outcome denotes the degree of emotional distress experienced by parents of critically ill children, as determined through the Depression, Anxiety, and Stress Scale–21 items (DASS-21). Higher scores on the scale indicate increased levels of psychological distress. Participants whose scores fall within the moderate to extremely severe range on any of the subscales are classified as having a poor psychological outcome, reflecting significant symptoms of depression, anxiety, or stress that may warrant psychosocial or clinical intervention.

	Depression	Anxiety	Stress
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely Severe	28+	20+	34+

Table 1 Validated DASS21 grading

4.7 Data Collection Instruments and Procedure

Instruments

- **Structured questionnaire**: To collect socio-demographic and clinical information
- **DASS-21** (Depression Anxiety Stress Scale): To assess depression, anxiety, and stress symptoms.
    - The **DASS-21** is a widely used self-report instrument designed to measure three related negative emotional states: depression, anxiety, and stress. It consists of 21 items, with seven items dedicated to each subscale. Respondents rate how much each statement applied to them over the past week using a 4-point Likert scale ranging from 0 ("Did not apply to me at all") to 3 ("Applied to me very much or most of the time"). Subscale scores are summed and multiplied by two to obtain the final scores. The tool is valued for its simplicity, internal consistency, and discriminative validity across diverse populations. Studies conducted in African contexts, including Ethiopia, have confirmed the validity and reliability of the DASS-21 for assessing emotional distress. In an Ethiopian validation study, the tool demonstrated good internal consistency with Cronbach's alpha values of 0.82 for depression, 0.80 for anxiety, and 0.83 for stress, indicating its suitability for use among caregivers and general populations in the country (30).
- **Brief COPE**: to assess coping mechanisms
    - The Brief COPE is a standardized instrument developed by Carver (1997) to assess coping responses to stress. It includes 28 items that measure 14 coping strategies, each represented by two items. These strategies are broadly categorized into adaptive (positive) coping styles such as active coping, planning, acceptance, use of emotional and instrumental support, and positive reframing and maladaptive (negative) coping styles, such as denial, behavioral disengagement, self-blame, and substance use. Responses are scored on a 4-point Likert scale ranging from 1 ("I haven't been doing this at all") to 4 ("I've been doing this a lot"). The Brief COPE has been validated in various cultural settings, including African countries. In Ethiopia, adaptation and psychometric evaluation of the tool have shown satisfactory reliability, with a Cronbach's alpha above 0.70 across most subscales, supporting its applicability for assessing coping mechanisms among parents and caregivers in stressful health-related contexts (31,32)

Procedure

Data were collected via face-to-face interviews conducted by trained data collectors, supplemented by a review of patient records to extract clinical variables (e.g., diagnoses, length of stay, illness severity).

4.8. Data Analysis

Following a thorough completeness check, the data were processed and analyzed using R software. Descriptive statistics, including means, medians, frequencies, and standard deviations, were used to summarize the dataset. The inferential analysis began with a binary logistic regression; variables with P-values < 0.25 in this initial screening were included in a multivariable logistic regression model. To specifically mitigate small-sample bias, Firth's penalized logistic regression was utilized. Within the final model, results were considered statistically significant if they reached a P-value < 0.05. All findings are summarized and illustrated using descriptive tables and charts.

4.9. Ethical Considerations

The study was conducted with rigorous attention to ethical standards, beginning with formal ethical clearance granted by the Department of Pediatrics and Child Health at Addis Ababa University. Written informed consent was obtained from all participants to ensure voluntary and informed involvement. To protect participant privacy, confidentiality, and anonymity were strictly maintained by coding all data and securing personal identifiers. Finally, in keeping with clinical responsibility, any participants identified as experiencing high levels of psychological distress were referred to the psychiatry department for specialized evaluation and management.

5. Dissemination of findings.

The results were shown in both tabular and graphical formats. The study findings were discussed on the day of the research defense, and both hard and soft copies of the formal report will be sent to the Department of Pediatrics and Child Health. Additionally, the study results will be published in national or international scientific journals.

6. Result

The study included a total of 83 participants, of whom 63 (75.9%) were female and 20 (24.1%) were male. Most participants were married (n = 80, 96.4%), with only a small proportion divorced (n = 3, 3.6%). Regarding educational attainment, 35 participants (42.2%) had a degree or higher, 15 (18.1%) had a diploma, 20 (24.1%) had completed secondary education, and 13 (15.7%) had only primary education. Occupational status was evenly distributed between employed (36.1%) and self-employed (36.1%) participants, with the remaining 23 participants (27.7%) unemployed. In terms of religion, the majority identified as Orthodox Christian (n = 45, 54.2%), followed by Muslim (n = 21, 25.3%) and Protestant (n = 17, 20.5%). Monthly household income varied widely: most participants reported incomes between 10,001–20,000 ETB (n = 49, 59.0%), followed

by >20,000 ETB (n = 16, 19.3%), <5,000 ETB (n = 12, 14.5%), and 5,001–10,000 ETB (n = 6, 7.2%).

Regarding the relationship to the child, the majority of respondents were mothers (n = 63, 75.9 %), while fathers accounted for 20 participants (24.1%). The sex of the child was predominantly male (n = 52, 62.7%) compared to female (n = 31, 37.3%). Most children had no previous PICU admission (n = 80, 96.4%), and a majority were currently mechanically ventilated during the study period (n = 58, 69.9%). Surgical intervention during the admission was reported for 50 children (60.2%), while 33 children (39.8%) did not undergo surgery.

Treating team impressions of the expected prognosis indicated that 41 participants (49.4%) were considered to have a good prognosis, 13 (15.7%) a poor prognosis, and the remaining 29 (34.9%) had an unknown prognosis.

In this study, the psychological outcome of participants was assessed, and the majority were found to have a poor outcome. Specifically, 57 participants (68.7%) exhibited poor psychological outcomes, while only 26 participants (31.3%) demonstrated normal psychological outcome score.

Variable	Category / Statistic	n	%
Sex	Female	63	75.9
	Male	20	24.1
Marital status	Divorced	3	3.6
	Married	80	96.4
Educational status	Degree+	35	42.2
	Diploma	15	18.1
	Primary	13	15.7
	Secondary	20	24.1
Occupation	Employed	30	36.1
	Self-employed	30	36.1
	Unemployed	23	27.7
Religion	Muslim	21	25.3
	Orthodox	45	54.2
	Protestant	17	20.5
Monthly household income	< 5,000 ETB	12	14.5
	5,001–10,000 ETB	6	7.2
	10,001–20,000 ETB	49	59.0
	> 20,000 ETB	16	19.3
Relationship to child	Father	20	24.1
	Mother	63	75.9
Sex of child	Female	31	37.3
	Male	52	62.7
Previous PICU admission	No	80	96.4

	Yes	3	3.6
Is the child currently mechanically ventilated?	No	25	30.1
	Yes	58	69.9
Has the child had surgery during this admission	No	33	39.8
	Yes	50	60.2
Expected prognosis (treating team impression)	Good	41	49.4
	Poor	13	15.7
	Unknown	29	34.9
Psychological outcome	Normal score	26	31.3
	Abnormal score (poor)	57	68.7

Table 2. Socio-demographic, Clinical Characteristics, and Psychological Outcomes of Participants

The study included 83 participants, with parents having a mean age of 30.7 years (SD = 4.78, range 20–58). On average, participants had 2.3 children (SD = 0.88, range 1–7), and The mean age of the children was 3.8 years (SD = 3.31, range 0.08–11). The duration of illness prior to PICU admission varied widely, with a mean of 38.8 days (SD = 59.7, range 1–380), while the length of PICU stay averaged 4.0 days (SD = 6.46, range 2–55).

Regarding coping mechanisms, participants scored a mean of 15.6 (SD = 2.07, range 12–21) on problem-focused coping, 21.1 (SD = 3.51, range 15–30) on emotion-focused coping, and 18.0 (SD = 6.19, range 6–32) on dysfunctional coping. These findings indicate that, on average, participants tended to use more emotion-focused strategies, followed by dysfunctional and problem-focused coping strategies.

Variable	Mean	SD	Min	Max
Age of parent (years)	30.7	4.78	20	58
Number of children	2.30	0.88	1	7
Number of visits to child per day during PICU stay	4.48	0.77	2	6
Age of child (years)	3.82	3.31	0.08	11
Duration of illness before admission in PICU (days)	38.8	59.7	1	380
Duration of PICU admission (days)	3.99	6.46	2	55
Problem-focused coping score	15.6	2.07	12	21
Emotion-focused coping score	21.1	3.51	15	30
Dysfunctional coping score	18.0	6.19	6	32

Table 3. Summary of Participant Characteristics and Coping Scores (n = 83)

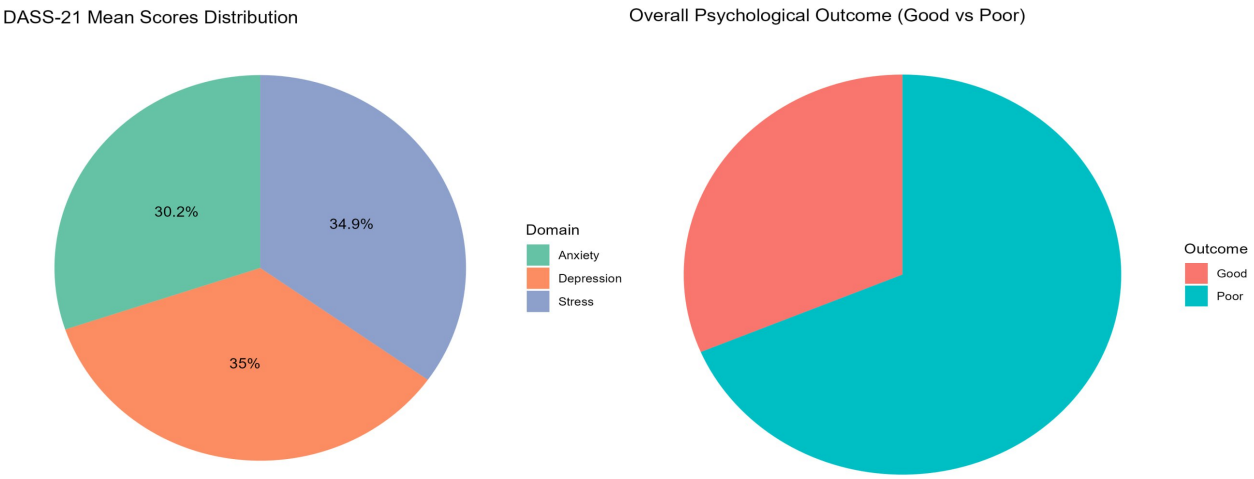


Diagram 2 Prevalence of Depression, Anxiety, and Stress Among Parents of Children Admitted to the PICU (DASS-21 Subscales)

The assessment of psychological outcomes using the DASS-21 scale revealed that a substantial proportion of parents experienced significant distress during their child's PICU admission. Specifically, 62.7% of parents reported symptoms of depression, 60.2% exhibited symptoms of anxiety, and 26.5% experienced stress. These findings indicate that depression and anxiety are more prevalent than stress in this population, highlighting the considerable emotional burden faced by parents of critically ill children. The high prevalence underscores the need for early

psychological screening and targeted interventions to support parental mental health during and after PICU hospitalization.

Subscale	Count	Percent (%)
Depression	52	62.65
Anxiety	50	60.24
Stress	22	26.51

Table 4: Prevalence of Psychological Distress Among Parents (DASS-21 Subscales)



Diagram 3 Prevalence of Psychological Distress Among Parents (DASS-21 Subscales)

Bivariate and Multivariate Logistic Regression Analysis of Factors Associated with Psychological Outcomes Among Parents of Children in PICU

In the bivariate analysis of factors associated with poor psychological outcomes among parents of PICU-admitted children, several variables showed significant associations. Higher age of the parent was marginally protective (OR = 0.88, 95% CI: 0.76–0.98, p = 0.051), while longer duration of illness before PICU admission increased the odds of poor psychological outcomes (OR = 1.02, 95% CI: 1.00–1.04, p = 0.030). Parents who were self-employed had lower odds of poor psychological outcomes compared to others (OR = 0.49, 95% CI: 0.17–1.40, p = 0.187). Being the father (vs mother) was associated with higher odds of poor psychological outcomes (OR = 4.03, 95% CI: 1.45–11.6, p = 0.008), and male children's parents were more likely to experience poor psychological outcomes than female children's parents (OR = 3.49, 95% CI: 1.34–9.44, p = 0.011). Critically, parents of children who were mechanically ventilated (OR = 55.6, 95% CI: 15.1–263, p < 0.001) or had surgery during admission (OR = 15.7, 95% CI: 5.25–55.7, p < 0.001) were at substantially higher risk. Other factors, including number of children, age of the child, duration of

PICU stay, coping strategies, educational status, religion, and expected prognosis, showed weaker or non-significant associations in this analysis.

Variables with a p-value < 0.25 in the bivariate analysis including age of parent, duration of illness before PICU admission, duration of PICU admission, dysfunctional coping, mechanical ventilation, and surgery during admission were considered for inclusion in the multivariate logistic regression model. This approach ensures that potentially important predictors are adjusted for confounding, allowing the multivariate analysis to identify independent factors associated with poor psychological outcomes while accounting for the interrelationships among variables.

Variable	COR	95% CI	p-value
Age of parent (years)	0.88*	0.76 – 0.98	0.051*
Number of children	1.25	0.73 – 2.35	0.447
Number of visits to child per day	0.79	0.41 – 1.45	0.447
Age of child (years)	0.96	0.84 – 1.11	0.587
Duration of illness before PICU admission (days)	1.02*	1.00 – 1.04	0.030*
Duration of PICU admission (days)	0.97	0.87 – 1.04	0.361
Problem-focused coping	1.00	0.80 – 1.26	0.969
Emotion-focused coping	1.05	0.92 – 1.21	0.494
Dysfunctional coping	1.04	0.96 – 1.12	0.318
Educational status	2.06	0.58 – 8.62	0.285
Occupation (Self-employed)	0.49*	0.17 – 1.40	0.187*
Religion (Orthodox)	1.90	0.62 – 5.82	0.257
Relationship to child (Father vs Mother)	4.03*	1.45 – 11.6	0.008*
Sex of child (male vs female)	3.49*	1.34 – 9.44	0.011*
Currently mechanically ventilated (Yes vs No)	55.6*	15.1 – 263	2.24e-8*
Had surgery during admission (Yes vs No)	15.7*	5.25 – 55.7	3.50e-6*
Expected prognosis (poor vs good)	2.36*	0.61 – 11.7	0.240*

Table 5 . Bivariate Logistic Regression of Factors Associated with Poor Psychological Outcome (p < 0.25 marked with *)

In the multivariate analysis, shorter duration of PICU admission was significantly associated with poor psychological outcomes among parents, with an adjusted odds ratio (AOR) of 0.93 (95% CI: 0.86–0.99, $p = 0.024$), suggesting that parents whose children had shorter PICU stays were more

likely to experience psychological distress. Additionally, parents of children who were mechanically ventilated had substantially higher odds of poor psychological outcomes (AOR = 21.95, 95% CI: 5.72–101.23, $p < 0.001$), indicating the heightened stress associated with critical illness requiring intensive interventions. Parents of children who underwent surgery during the admission also showed increased odds of psychological distress (AOR = 6.74, 95% CI: 1.15–38.43, $p = 0.035$).

Other variables included in the model such as age of the parent, duration of illness before PICU admission, and dysfunctional coping were not statistically significant after adjustment, although they were considered important based on the bivariate analysis.

Variable	Adjusted OR (AOR)	95% CI	p-value	Significance
Age of parent (years)	0.94	0.73 – 1.13	0.618	
Duration of illness before PICU admission (days)	1.00	0.99 – 1.03	0.950	
Duration of PICU admission (days)	0.93*	0.86 – 0.99	0.025*	*
Dysfunctional coping score	1.06	0.94 – 1.19	0.347	
Currently mechanically ventilated (Yes vs No)	21.95*	5.72 – 101.23	<0.001*	*
Had surgery during admission (Yes vs No)	6.74*	1.15 – 38.43	0.035*	*

Table 6. Multivariate Logistic Regression Analysis of Factors Associated with Poor Psychological Outcomes Among Parents of PICU-Admitted Children

7. Discussion

7.1. Overview of Psychological Impact

The admission of a child to the Pediatric Intensive Care Unit (PICU) is a profoundly traumatic event that triggers significant psychological distress in parents. Our study findings align with international literature, revealing a high prevalence of poor psychological outcomes. Specifically, 68.7% of participants in our study exhibited poor psychological outcomes. This is consistent with a cross-sectional study conducted in Canada of 118 parents (74 mothers, 44 fathers) in the PICU, which specifically showed that 24% of parents had severe anxiety, 51% had symptoms indicative of major depression, and 26% had significant decisional conflict. (13) In our research, 62.7% of parents reported symptoms of depression, 60.2% exhibited symptoms of

anxiety, and 26.5% experienced stress. The high burden identified in our results (n=57, 68.7%) highlights the severity of the psychological impact, which some studies have noted. For instance, metanalysis which was done on psychological outcomes among PICU survivors' family members have established that such acute distress is a strong precursor to long-term complications like Post-Traumatic Stress Disorder (PTSD). Post-traumatic stress disorder was diagnosed in 10% to 48% of parents 3 to 9 months later. Parents who experienced moderate to severe anxiety and depression 3 to 6 months later was 20.9% to 42% and 6.1% to 42.6%, respectively. (9) However, investigating these long-term courses remains particularly challenging in low-resource settings such as Ethiopia, where logistical and financial constraints often limit longitudinal follow-up and, consequently, the assessment of parental recovery beyond the immediate PICU discharge.

7.2. Sociodemographic and clinical variables associated with poor psychological outcome

Although not significant in the multivariate analysis after adjustment for clinical factors, the bivariate analysis revealed that fathers had higher odds of poor psychological outcomes compared to mothers (OR = 4.03, 95% CI: 1.45-11.6, p = 0.008). This finding is important given that the literature has traditionally focused more on maternal distress. A systematic review of 24 studies examined psychological distress in fathers of children admitted to the PICU, Fathers experience significant stress, PTSD symptoms, anxiety, depression, and family disruption during and after admission. Overall, distress levels are similar to those of mothers, but fathers often show delayed distress, especially after discharge, and may experience stronger feelings of helplessness. Due to inconsistent findings, further research is needed to better understand gender differences and guide targeted family-focused interventions (14)

Mechanical ventilation emerged as the strongest predictor of poor psychological outcomes, with parents of ventilated children having nearly 22 times the odds of experiencing psychological distress compared to parents of non-ventilated children. The study which was conducted in a Paediatric Intensive Care Unit (PICU) at a tertiary hospital in Zagreb, Croatia, and included 96 parents, using the Parental Stressor Scale: PICU (PSS: PICU), the study found that parents were highly exposed to multiple stressors during their child's PICU admission, specifically mechanical ventilation is the most intense stressor reported by parents was "child's breathing depending on the ventilator", making it the highest-rated source of stress in the PICU. This indicates that seeing their child dependent on a ventilator significantly increased parental stress levels (33). In our study, the high proportion of mechanically ventilated children (69.9%) suggests that the PICU population was critically ill, which likely contributed to the overall high prevalence of parental distress.

Surgery during PICU admission was the second strongest predictor of poor psychological outcomes (AOR = 6.74). This finding highlights the additional psychological burden imposed by

surgical interventions in the context of critical illness. Surgery represents a discrete, high-risk event that parents must consent to, often under conditions of uncertainty and time pressure. The decision-making process itself can be a source of significant distress, as parents must weigh risks and benefits while emotionally overwhelmed. A study which was conducted in a tertiary hospital comparing children admitted to the PICU with those admitted to a general pediatric ward with their parents. Parents of PICU children also had higher rates of anxiety and depression. Importantly, greater illness severity and exposure to invasive procedures, like surgery were significant predictors of worse psychological outcomes, indicating that intensive interventions are associated with increased parental and child psychological distress.(8).

Interestingly, shorter duration of PICU stay was associated with poor psychological outcomes (AOR = 0.93 per day), suggesting that each additional day in the PICU was associated with slightly lower odds of psychological distress. This contradict with national prospective longitudinal study which was conducted across eight pediatric intensive care units (PICUs) in Switzerland, where researchers followed 199 mothers and fathers of chronic critically ill (CCI) children to assess their psychosocial outcomes. The study specifically focused on the evolution of stress and family functioning over time, noting that family functioning significantly decreased after 30 days of hospitalization, highlighting the cumulative toll of a prolonged stay on parental mental health (7).

7.3. Coping Mechanisms

The assessment of coping strategies revealed that parents primarily employed emotion-focused coping (mean = 21.1, SD = 3.51), followed by dysfunctional coping (mean = 18.0, SD = 6.19) and problem-focused coping (mean = 15.6, SD = 2.07). This pattern of coping strategy use provides important insights into how parents attempt to manage the psychological demands of having a child in the PICU.
A cross-sectional study which was conducted in the Pediatric Intensive Care Unit (PICU) of a tertiary hospital in Guangdong Province, China, denotes, parents who used positive coping strategies, such as seeking information, problem-solving, and regulating emotions, had lower stress levels, while those using negative coping (avoidance, denial, withdrawal) experienced higher stress. Disease uncertainty increased stress both directly and by pushing parents toward maladaptive coping. Therefore, reducing uncertainty and promoting positive emotional coping can help lower parental stress in the PICU (18).

However, the effectiveness of emotion-focused coping depends on the specific strategies employed and the context in which they are used. Adaptive emotion-focused strategies, such as seeking social support and positive reframing, can facilitate psychological adjustment and reduce distress. A prospective longitudinal study involving 196 parents explored posttraumatic growth in mothers and fathers of critically ill children and found that certain cognitive and emotional

processing strategies were associated with positive psychological changes following the traumatic experience. This suggests that emotion-focused coping, when adaptive, can not only reduce distress but also facilitate growth and resilience (34).

The relatively high use of dysfunctional coping strategies (mean = 18.0) is concerning, as these strategies, including denial, behavioral disengagement, self-blame, and substance use, are generally associated with poorer psychological outcomes. Although dysfunctional coping was not a significant predictor in the multivariate model, its presence at moderate levels suggests that a subset of parents may be employing maladaptive strategies that could exacerbate or maintain psychological distress. A Study which was conducted in USA, a systematic review on the impact of pediatric critical illness and injury on families, noted that maladaptive coping strategies were associated with worse long-term psychological outcomes (1).

The coping profile observed in this study has important implications for psychosocial interventions. Interventions should acknowledge and support adaptive emotion-focused coping strategies while helping parents reduce reliance on dysfunctional coping. Psychoeducation about the normality of emotional responses, facilitation of social support, and guidance in meaning-making and acceptance may be beneficial. Additionally, interventions that create opportunities for problem-focused coping by enhancing parental participation in care, providing clear information, and supporting parental advocacy, may help parents feel more empowered and less helpless.

8. Limitations and Future Directions

Several limitations of this study should be acknowledged. The cross-sectional design limits causal inference; while mechanical ventilation and surgery were associated with poor psychological outcomes, the directionality and temporal dynamics of these relationships cannot be definitively established. Longitudinal studies are needed to track the trajectory of parental psychological distress from PICU admission through discharge and beyond, identifying critical periods for intervention. Additionally, the study was conducted in a single center, which may limit generalizability to other settings with different resources, cultural contexts, or patient populations.
The assessment of coping strategies, while informative, was based on self-report measures that may be subject to social desirability bias or limited insight. Future research could employ mixed methods approaches, combining quantitative assessments with qualitative interviews to gain deeper understanding of how parents experience and manage PICU-related stress.

Future research should prioritize longitudinal studies to track outcomes and developmental trajectories over time. To achieve a more comprehensive perspective, a mixed-methods approach

that integrates quantitative analysis with qualitative interviews is recommended to triangulate data and capture deeper insights into participant experiences. Additionally, transitioning to multicenter study designs will be crucial for enhancing the generalizability of findings and ensuring that results are representative across diverse clinical settings.

Finally, intervention research is critically needed. While this study documents the problem of parental psychological distress in the PICU, evidence-based interventions to address this problem remain limited. Randomized controlled trials of psychosocial interventions, including peer support programs, cognitive-behavioral interventions, mindfulness-based approaches, and family-centered care models, are needed to identify effective strategies for supporting parental mental health in the PICU context.

9. Conclusion

This study demonstrates that parents of children admitted to the PICU experience high rates of psychological distress, with nearly two-thirds experiencing depression or anxiety. Mechanical ventilation and surgical interventions are powerful predictors of poor psychological outcomes, highlighting the need for enhanced support for parents facing these specific stressors. Parents primarily employ emotion-focused coping strategies, suggesting that interventions should support adaptive emotional regulation while creating opportunities for empowerment and problem-focused coping where possible. These findings underscore the urgent need for integrated psychosocial support services in the PICU and provide a foundation for developing targeted interventions to support parental mental health during one of the most challenging experiences a family can face.

10. Recommendations

Our hospital should implement routine psychological screening for all parents in the PICU, with a prioritized focus on those whose children require mechanical ventilation or surgical procedures. Clinical teams should integrate multidisciplinary psychosocial support that promotes adaptive emotional regulation while providing practical resources to enhance problem-focused coping and parental empowerment. Furthermore, hospital policy should advocate for family-centered care models that bridge the gap between medical treatment and mental health support, ensuring that parental well-being is viewed as an essential component of the pediatric critical care pathway.

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