

## Original Article

# Parental Anxiety During PICU Admission: A Single Centre Experience from Turkey

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### Abstract

**Objective:** The aim of this study was to assess anxiety levels in parents of children admitted to a paediatric intensive care unit (PICU) and to identify influencing factors at admission. **Method:** One hundred and seventy critically ill children and their parents were enrolled in this study. The patients' demographic data, Paediatric Risk of Mortality score (PRISM III), Paediatric Logistic Organ Dysfunction score (PELOD), reason for admission, comorbidities, mechanical ventilator procedure, PICU stay, and survival were recorded from the medical chart. The Beck Anxiety Inventory (BAI) was used to evaluate the parents' anxiety. Additionally, the parents' sex, age, time of admission, admission place, education level, and family income were recorded. **Results:** A total of 170 children and their parents were enrolled in this study. Ninety-two patients had a prior chronic illness. The family members of children in a PICU experience moderate anxiety during admission. The BAI was statistically higher in mothers than in fathers ( $p=0.009$ ). According to the children's medical history, both parents' median BAI were not significantly different in acute illness ( $p=0.52$ ). On the other hand, the BAI of mothers was higher than of fathers who had children with chronic illness ( $p=0.03$ ). We found two variables that significantly contributed to the anxiety of parents associated with the PICU admission. These were the time of admission (OR 1.05, 95% CI 1.00-1.10) and a mechanical ventilation procedure (OR 5.93, 95% CI 2.66-10.53). **Conclusions:** While the anxiety is prominent for both parents of acutely ill children, the mothers of chronically ill children need more emotional support to create a robust patient-physician relationship during PICU admission. During this period, determining parental needs or the sources of stress may contribute to both the short- and long-term improvement of parents' mental health.

**Key words** Anxiety; Children; Paediatric intensive care unit; Parents

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### Introduction

Having a child in the paediatric intensive care unit (PICU) has been shown to be a stressful experience for both mothers and fathers.<sup>1</sup> This crisis is amplified by the stress felt by the parents in the PICU environment.<sup>2</sup> The intensive care setting is a busy and frightening place dominated by sick children, medical personnel, advanced medical equipment, bright lights, and shrill monitors. Additionally, the child's uncertain outcome, the disruption of the parents' role and their separation from the child, the

appearance of the child, and the fear of the child suffering from painful procedures contribute to stress.<sup>2-6</sup> During this period, health professionals are traditionally trained to focus on the needs of the patient, and the anxiety of the family may be overlooked.<sup>1,2</sup> On the other hand, it is very difficult to evaluate parents' anxiety because of limited communication. The Beck Anxiety Inventory (BAI) is a simple and brief method to assess parents' anxiety in the PICU.<sup>7</sup> It has been widely used since 1988 and was adopted by Ulusoy et al in 1998 for Turkey.<sup>8,9</sup> The present study aimed to evaluate the anxiety of parents whose children were admitted to the PICU and the factors influencing this situation in Turkey.

## Material and Methods

This study was conducted in the PICU of the Erciyes University Faculty of Medicine, a 12-bed PICU, and was approved by the local ethics committee of Erciyes University. A total of 170 patients and their parents were enrolled in this study. The patients' demographic data, Paediatric Risk of Mortality score (PRISM III), Paediatric Logistic Organ Dysfunction score (PELOD), reason for admission, comorbidities, time of admission, admission place, mechanical ventilator procedure, PICU stay, and survival were recorded from the medical chart. The BAI was used to evaluate the parents' anxiety. Additionally, the parents' sex, age, education level, family income, and experience of losing a child were recorded. Inclusion criteria were defined as having a child hospitalised in the PICU, willingness to participate, and no previous diagnosis of psychiatric disease. Participants who did not meet these criteria were excluded.

### Beck Anxiety Inventory

The parents' anxiety levels were evaluated with BAI by questioning either mother or father of the patient. This scale is a self-report measure of anxiety. The total score is calculated by finding the sum of the 21 items. Each item scored between 0 and 3 points.<sup>7</sup> A score of 0-21 = low anxiety, a score of 22-35 = moderate anxiety, and a score of 36 and above = potentially concerning levels of severe anxiety.

Patients were classified on the basis of socioeconomic status: monthly income less than 1,500 Turkish Lira (TL) was regarded as poor socioeconomic status, 1,500-3,000

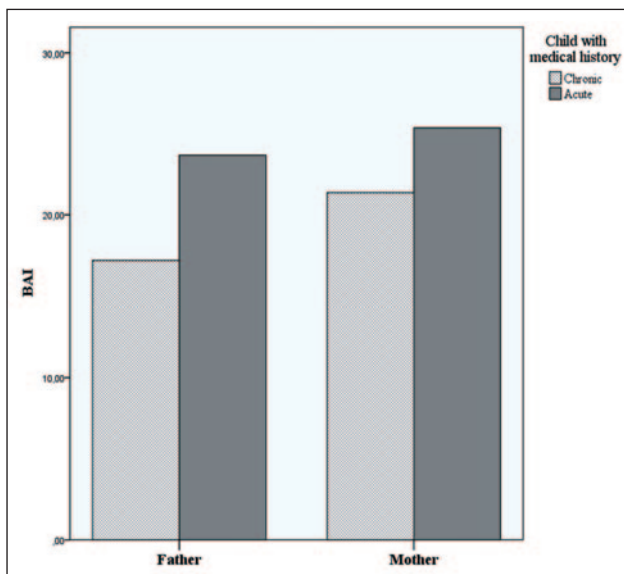
TL was moderate socioeconomic level, and above 3,000 TL was considered good socioeconomic status. The parents' education levels and whether they had previously lost any children were also recorded.

**Statistical analysis** was performed using SPSS version 22.0 (IBM, Armonk, NY, USA). The normality of data was tested by the Shapiro-Wilk test. Numerical variables were expressed as mean  $\pm$  SD or median (minimum, maximum) where appropriate. The comparison between groups for data with a normal distribution was performed using Student's t-test, and the comparison between groups for data that did not show a normal distribution was performed using the Mann-Whitney U test. The bivariate and partial correlation tests were used to analyse the correlations between parameters. Two-tailed p values of 0.05 were used to indicate statistical significance. Categorical variables were compared by means of a  $\chi^2$  test. Univariate and multiple binary logistic regression analyses were performed to estimate influencing effects of multiple variables on BAI. Significant variables at  $p < 0.25$  were included to the multiple model, and forward elimination method was used via likelihood ratio statistic, to identify the independent risk factors.

## Results

A total of 170 children (79 boys [46.5%] and 91 girls [53.5%]) and their parents (92 mothers [54.1%] and 78 fathers [45.9%]) were enrolled in this study. The children's median age was 36 months (1-216 months). Admission diagnoses included the following: 72 patients had a respiratory failure, 7 patients had an infectious disease, 23 patients had a neurological disease, 20 patients had a haematology/oncology disease, 9 patients had a cardiac disease, 13 patients had a trauma, and 18 patients had an intoxication. The subsequent mortality rate was 16.5%. Ninety-two patients (54.1%) had chronic illness previously. Baseline characteristics and demographic data are summarised in Table 1. The median age was 31 years (19-51 years) for mothers and 32 years (23-50 years) for fathers ( $p=0.273$ ). The BAI was statistically higher in mothers than in fathers (median BAI in mothers 26 (min.5-max.45) vs median BAI 22 (min.1-max.43) in fathers,  $p=0.009$ ). No significant correlation was found among PRISM, PELOD, or BAI ( $p=0.68$ ,  $r=0.08$ ;  $p=0.32$ ,  $r=0.03$ ). However, there was a low but significant correlation between child age and BAI ( $p=0.04$ ,  $r=0.151$ ). The BAI was not statistically significant in terms of the sex of the children ( $p=0.86$ ).

According to the medical history, both parents' median BAI was not statistically significant (median BAI level for mothers 25 [min.6-max.43] vs. median BAI for fathers 24 [min.7-max.45],  $p=0.52$ ) in acute illness. On the other hand, the BAI of mothers was higher than the BAI of fathers who had children with chronic illness (median BAI level for mothers 23 [min.1-max.45] vs. median BAI for fathers 18 [min.5-max.42],  $p=0.03$ ). Based on the medical history, the BAI of both parents is illustrated in Figure 1. On comparison of parents' demographic properties, the educational and socioeconomic statuses of mothers were lower than those of fathers ( $p=0.01$ ). Eight (3 fathers and 5 mothers) parents had lost a child before. There were no differences in terms of the experience of losing a child between parents (median BAI level for mothers 27 [min. 12-max. 39] and median BAI for fathers 25 [min.10-max. 37],  $p=0.352$ ). Detailed analysis of the parents is presented in Table 2. We evaluated the influencing factors of BAI. Using univariate logistic regression analysis, parent's sex, (Odds ratio (OR) 1.52, 95 CI 0.83-2.79), child's age (OR 1.04; 95% CI 0.99-1.09), time of admission (OR 1.59, 95% CI 0.86-2.95) and mechanical ventilation practice (OR 4.73, 95 % CI 2.45-9.16) were all independently associated with BAI. With multiple logistic regression analysis, only two factors; time to admission (OR 1.05, 95% CI 1.00-1.10) and mechanical ventilation practice (OR 5.93, 95% CI 2.66-10.53) were independently associated with BAI severity (Table 3).



**Figure 1** The BAI of parents with regard to children's medical history.

**Table 1** Basic characteristic of patients admitted in PICU

Patients	
Age, months, median	36 (1-216)
Male	79 (46.5%)
Length of PICU days	16 (2-124)
Survival	138 (75.2%)
Mechanical ventilation	100 (58.8%)
PRISM III	11 (1-41)
PELOD	11 (1-41)
Admission diagnosis	
Respiratory	72 (42.4%)
Infectious	7 (4.1%)
Neurologic	23 (13.5%)
Haematology/oncology	20 (11.8%)
Cardiologic	9 (5.3%)
Trauma	13 (7.6%)
Intoxication	18 (10.6%)
Child with medical history	
Chronic	92 (54.1%)
Acute	78 (45.9%)
Previous PICU admission	
Yes	71 (31.1%)
No	99 (68.9%)

Data are expressed as n (%) or median (minimum-maximum). PRISM III: Paediatric Risk of Mortality; PELOD: Paediatric Logistic Organ Dysfunction; PICU: Paediatric Intensive Care Unit

**Table 2** Comparison of parents' properties

	Mother	Father	p
Age, years	31 (19-51)	32 (23-50)	0.273
BAI	26 (5-45)	22 (1-43)	0.009
Education level			
<High school	72 (80%)	45 (56.3%)	0.01
High school	16 (17.8%)	34 (42.5%)	
University	2 (2.2%)	1 (1.2%)	
Socioeconomic status			
Poor	79 (87.8%)	51 (63.8%)	0.01
Average	10 (11.1%)	24 (30%)	
Good	1 (1.1%)	5 (6.2%)	
BAI with experience of child lost	27 (12-39)	25 (10-37)	0.352

BAI: Beck Anxiety Inventory. Data are expressed as n (%) or median (minimum-maximum).

## Discussion

It is very important for all staff personnel to know about parental stress and to understand how parents are feeling and how to best to deal with them during admission. This can facilitate and improve communication between parents and medical professionals during this stressful time.<sup>1,2</sup>

This is the first study to evaluate the anxiety of both parents and contributing factors in a PICU in Turkey. According to our results, it can be said that the mean BAI level of parents is at a moderate level. Additionally, mothers were significantly more stressed than fathers. These results were different from other reports showing equal stress for both mothers and fathers.<sup>10,11</sup> The mean BAI level of the parents was also significantly higher among those with children with acute illness than those with children with chronic illness for both mothers and fathers. In acute illness, the parental reactions are associated with many factors, such as the child's sudden illness, lack of knowledge, and uncertainties regarding with long-term outcomes.<sup>12</sup> On the other hand, the mean BAI level was only statistically higher in mothers who had chronically ill children. In Turkey, mothers are more involved in the care of their child, while fathers are mainly responsible for home income and take

less part in directly caring for their children. Additionally, the mothers get stressed because of extra energy and time requirement, not being able to deal with the other child. Tensions rise in human relations, particularly in marital and emotional relationships. Inappropriate reactions to this traumatic situation and feelings of guilt in the family may lead to depression in the mother.<sup>13,14</sup> Similarly, van Oers et al reported that parents of a chronically ill child, especially mothers, had high levels of anxiety and depression.<sup>14</sup> We also noted that all parents of children who were admitted for the first time were more stressed. This period was described by parents as a shock or disbelief at the situation; guilt and blame were avoidance and escape strategies.<sup>15</sup> These findings are the same as those of Kumar and Avabratha's study.<sup>16</sup>

As we know, the loss of a child is a significant stressor on parents. The risk of a child's death may yield an undesirable reaction, such as refusing treatment or an initial aggressive attitude. In our study, 8 (3 fathers and 5 mothers) parents had lost a child before. Interestingly, their BAI levels were not statistically different from each other. The reason may be due to the sociocultural and religious differences from other countries. Prayer can often be comforting and helpful to decrease anxiety levels for parents.<sup>17</sup>

**Table 3** The regression analysis of factors influencing BAI

Variables	Univariate logistic regression			Multiple logistic regression		
	OR	95 % CI	p	OR	95 % CI	p
Parent gender	1.52	0.83-2.79	0.176			
Socioeconomic status						
Low	1.00					
Mild	1.09	0.51-2.33	0.822			
Good	1.94	0.34-10.96	0.403			
Age of patient	1.02	0.75-1.07	0.358			
Gender of child	1.09	0.56-1.99	0.783			
Age of child	1.04	0.99-1.09	0.141			
Admission place						
Emergency service	1.00					
Inner hospital	1.05	0.532-2.088	0.880			
Outer hospital	1.25	0.542-2.881	0.600			
Time of admission	1.59	0.86-2.95	0.138	1.05	1.00-1.10	0.07
8 am to 4 pm						
4 pm to 8 am						
Previously child lost	1.54	0.37-6.86	0.537			
Mechanical ventilation procedure	4.73	2.45-9.16	0.001	5.93	2.66-10.53	0.001

We also evaluated the influencing factors of BAI. Using univariate logistic regression analysis, parent's sex, child's age, time of admission and mechanical ventilation practice were all independently associated with BAI. With multiple logistic regression analysis, we found two variables that significantly contributed to the anxiety of parents associated with the PICU. These were the time of admission and a mechanical ventilation procedure. Previous studies have revealed that parental stress is affected by children's intubation status.<sup>18,19</sup> Needle et al also highlighted that the parents interpreted mechanical ventilation as a more invasive procedure, and these procedures cause higher parental anxiety during admission.<sup>6</sup> Mechanical ventilation was found to be a more significant stressor in our study. Another factor in our study related to the anxiety level was the time of admission. We discovered that there is only one study evaluating the relationship between time of admission and anxiety.<sup>6</sup> Despite the study indicated no statistical difference related to anxiety level; the parents' anxiety was higher at admission between 4 PM and 8 AM in our study. The opinion that there are less medical personnel during this period compared to the period between 8 AM and 4 PM could explain this result.

Consequently, the family members of a child in the PICU experience moderate anxiety during admission. While the anxiety is more prominent for both parents of an acutely ill child, the mothers of chronically ill children may need more emotional support to create a robust patient-physician relationship during PICU admission. During this period, determining parental needs or the sources of stress may contribute to both the short- and long-term improvement of parents' mental health.

## Conflict of Interest

All authors have no conflict of interest regarding this paper.

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