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The Burden of Uncertainty: The Impact of Prolonged Pediatric Hospitalization on Parental Mental Health

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Abstract

Since the hospitalization of the child causes various changes within the family, this situation causes new stress factors for the mother and father. Stress, anxiety and depression in parents negatively affect the child and prevent parents from being sufficiently involved in the care of their children. This study aims to determine the relationship between intolerance of uncertainty and stress, anxiety levels and depression in parents of child patients who have been hospitalized for a long time. The study was conducted using a cross-sectional and purposeful sampling method, which is one of the quantitative research methods. The research was conducted with the parents of child patients who were hospitalized at SBÜ Van Education and Research Hospital between June 2023 and November 2023. A total of 147 parents whose children were hospitalized, who met the inclusion criteria, and agreed to participate were included in the study. The mean age of the participants was (28.80±6.27), almost all of them were female (n:132) and married (99.3%, n=146). The duration of hospitalization ranged from 7 to 120 (10.83±13.85) days. When the mean scores were examined, depression was 5.26±4.38 (0-21), anxiety was 4.57±4.17 (0-20), stress was 5.15±3.63 (0-15). From the mean scores of the subscales, prospective anxiety was 20.79±6.11 (7-35), inhibitory anxiety was 13.30±5.65 (5-25) and the total score of the intolerance of uncertainty scale was 34.10±10.61 (12-55). Of the participants in the study, 19.0% had mild depression, 19.0% had moderate depression, 6.8% had severe depression, and 6.1% had severe depression. The evidence strongly supports the idea that intolerance of uncertainty significantly impacts the mental health of parents whose children are hospitalized. Addressing intolerance of uncertainty through targeted interventions may provide a pathway to improve mental health outcomes for these parents, ultimately improving both their well-being and their ability to support their children through difficult times.

Keywords: Anxiety, depression, intolerance of uncertainty, stress

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Belirsizliğin Yükü: Uzun Süreli Pediatrik Hastane Yatışının Ebeveynlerin Ruh Sağlığı Üzerindeki Etkisi

Özet

Çocuğun hastaneye yatışı aile içinde çeşitli değişikliklere neden olduğundan dolayı bu durum anne ve baba için yeni stres faktörlerinin ortaya çıkmasına neden olmaktadır. Ebeveynlerde oluşan stres, anksiyete ve depresyon çocuğu olumsuz yönde etkilemekte ve ebeveynlerin çocuklarının bakımına yeteri kadar katılmalarına engel olmaktadır. Bu çalışmada hastanede uzun süre yatan çocuk hastaların ebeveynlerinde belirsizliğe tahammülsüzlüğün stres, anksiyete düzeyi ve depresyon ile ilişkisinin belirlenmesi amaçlanmaktadır. Çalışma; nicel araştırma yöntemlerinden kesitsel olarak ve amaçlı örneklem yöntemi kullanılarak gerçekleştirildi. Araştırma, Haziran 2023 - Kasım 2023 tarihleri arasında SBÜ Van Eğitim ve Araştırma Hastanesi'nde yatarak tedavi gören çocuk hastaların ebeveynleriyle gerçekleştirilmiştir. Çalışmaya, belirlenen katılım kriterlerini karşılayan ve gönüllü olarak katılmayı kabul eden toplam 147 ebeveyn dahil edilmiştir. Katılımcıların ortalama yaşı (28,80±6,27) olup tamamına yakını kadın (n:132) ve evlidir (%99,3 n=146). Hastanedeki yatış süresine bakıldığında 7-120 (10,83±13,85) gün arasında değişmektedir. Ortalama puanlara bakıldığında depresyon 5,26±4,38 (0-21), anksiyete 4,57±4,17 (0-20), stres 5,15±3,63 (0-15) idi. Alt ölçeklerin ortalama puanlarından ileriye yönelik kaygı 20,79±6,11 (7-35), engelleyici kaygı 13,30±5,65 (5-25) ve belirsizliğe tahammülsüzlük ölçeği toplam puanı 34,10±10,61 (12-55) idi. Çalışmaya katılan katılımcıların %19,0'u hafif düzeyde depresyon, %19,0'u orta düzeyde depresyon, %6,8'i ileri düzeyde depresyon ve %6,1'i çok ileri düzeyde depresyon yaşadıkları bulundu. Kanıtlar belirsizliğe tahammülsüzlüğün çocukları hastaneye kaldırılan ebeveynlerin ruh sağlığını önemli ölçüde etkilediği fikrini güçlü bir şekilde desteklemektedir. Hedefli müdahaleler yoluyla belirsizliğe tahammülsüzlüğü ele almak, bu ebeveynler için ruh sağlığı sonuçlarını iyileştirmeye yönelik bir yol sağlayabilir ve sonuçta hem refahlarını hem de zor zamanlarda çocuklarını destekleme yeteneklerini geliştirebilir.

Anahtar kelimeler: Anksiyete, belirsizliğe tahammülsüzlük, depresyon, stres

1. INTRODUCTION

Developmental challenges during childhood often increase the likelihood of encountering various health problems [1]. During such periods, children may be diagnosed with acute or chronic illnesses that require hospitalization [2]. The hospitalization of a child represents a major disruption in family life and leads to significant emotional and logistical challenges for parents [3,4]. As this situation causes various changes within the family system, it introduces new and intense stressors for both mothers and fathers. Moreover, the hospital is an unfamiliar and often intimidating environment for both the child and their parents [5]. Several factors contribute to parents' psychological distress during a child's hospitalization. These include the severity and duration of the illness, fear and uncertainty about recovery, unfamiliar medical equipment, increased caregiving demands, financial burdens, concern for other family members at home, and the overall unpredictability of the hospital experience [4]. Families accustomed to a stable routine may suddenly find themselves immersed in a medicalized setting, surrounded by unknown terminology and healthcare professionals, leading to emotional shock and psychological strain [6]. Studies involving parents of children with acute illnesses have demonstrated that hospitalization can significantly impact their mental health, often resulting in elevated levels of anxiety [1,7]. One psychological factor that may contribute to these outcomes is Intolerance of Uncertainty (IU), which is defined as a cognitive, emotional, and behavioral tendency to react negatively to uncertain situations [8]. The consequences of IU extend beyond momentary distress—it can influence parenting behaviors and disrupt overall family dynamics. For instance, parents with high levels of IU may experience difficulty in decision-making and problem-solving, potentially compromising their ability to provide effective support to their hospitalized child.

Herbert and colleagues [9] found that parents with high IU often perceive uncertain situations as highly stressful, which may lead them to avoid interactions or situations that could exacerbate their anxiety. This avoidance can interfere with communication with healthcare professionals and limit their involvement in their child's care. Ultimately, this may contribute to a vicious cycle of increasing stress and anxiety, further impairing parental well-being and care capacity.

One of the key predictors of anxiety is uncertainty about the future. IU is a significant risk factor for anxiety disorders, otherhand, IU represents a cognitive vulnerability for anxiety symptoms. As the duration of a child's illness extends, the future becomes increasingly uncertain, which may elevate anxiety in parents [3].

Numerous studies have reported that parental anxiety, depression, and uncertainty can negatively affect the hospitalized child and hinder parents' ability to engage in their care [1]. Excessive parental anxiety has been linked to longer hospital stays and poorer recovery outcomes for children [10]. Moreover, IU is also associated with depressive symptoms. Mahoney and McEvoy [11] emphasized that IU can be situation-specific and is closely linked with depression. Parents may experience feelings of sadness, hopelessness, and helplessness during prolonged hospitalizations, which may lead to the development of depressive symptoms. Depression is a common mental disorder that can affect individuals of any age or gender. It is characterized by persistent sadness, feelings of worthlessness, lack of interest in previously enjoyed activities, sleep and appetite disturbances, and, in some cases, suicidal ideation [8]. A study conducted by Kutlu and Demir [12] with 98 parents of hospitalized children in Turkey found significantly high levels of anxiety and depression among participants.

Stress, anxiety, and depression not only affect parents' own well-being but also their ability to participate actively in their child's care. Identifying the relationship between IU and these psychological outcomes is essential for developing interventions aimed at supporting parents and, in turn, enhancing the quality of care provided to hospitalized children.

This study aims to examine the relationship between intolerance of uncertainty and levels of stress, anxiety, and depression among parents of children with prolonged hospital stays.

1.1. Research Questions

- What are the levels of intolerance of uncertainty, stress, anxiety, and depression among parents of children hospitalized for extended periods?
- Do participants' intolerance of uncertainty, depression, stress, and anxiety scores vary according to their sociodemographic characteristics?
- What is the nature of the relationship between intolerance of uncertainty and stress, anxiety, and depression in these parents?
- To what extent does intolerance of uncertainty predict levels of depression, anxiety, and stress in parents of hospitalized children?

2. METHODOLOGY

This study was conducted using a cross-sectional design and purposive sampling method. The research was carried out between June 2023 and November 2023 in the pediatric clinics of SBÜ Van Training and Research Hospital. A priori power analysis was conducted using G*Power 3.1 to determine the required sample size for linear multiple regression analysis. Based on a medium effect size ($f^2 = 0.15$), an alpha level of 0.05, and a desired power of 0.95, the analysis indicated that a minimum of 89 participants would be required. Considering the potential for data loss, a total of 147 participants were included in the study to ensure an adequate sample size and sufficient statistical power.

2.1. Inclusion Criteria

- Being over 18 years of age,

- Being the primary caregiver of a child hospitalized in the pediatric ward,
- The child's hospitalization duration being at least 7 days,
- Ability to read and write,
- Willingness to participate and cooperate.

2.2. Exclusion Criteria

- Presence of a neurocognitive disorder,
- Presence of mental retardation,
- Hospitalization duration of less than 7 days.

In this study, a minimum hospitalization period of 7 days was chosen as an inclusion criterion to ensure that parents had adequate exposure to the hospital environment and the stressors associated with prolonged pediatric care. Short-term hospitalizations may not adequately reflect the psychological impact of extended uncertainty, caregiving burden, and disruption of family life. Previous research suggests that the duration of hospitalization is positively associated with increased levels of parental stress, anxiety, and depression (3,12). The 7-day threshold allows for the capture of psychological responses that develop and intensify over time, rather than immediate or transient reactions. Additionally, hospital stays exceeding one week typically involve more complex medical procedures, increased uncertainty regarding treatment outcomes, and greater caregiving demands, all of which are relevant to the constructions examined in this study, particularly intolerance of uncertainty.

2.3. Data Collection Tools

The data collection tools used in this study included a personal information form developed by the researcher based on a review of the literature, the Intolerance of Uncertainty Scale (IUS-12), and the Depression, Anxiety, and Stress Scale-21 (DASS-21).

2.3.1. Personal information form

The personal information form, developed by the researcher based on literature, was used to collect data regarding sociodemographic and disease-related characteristics of the children and parents. The parent-related diagnostic form contained 13 questions regarding the parent's age, gender, education level, employment status, income level, marital status, number of children, the presence of another person in the household who is also cared for, and the presence of any psychological disorders, among others. The child-related diagnostic form included 4 questions concerning the child's age, whether the child's illness was acute or chronic, the number of days the child had been hospitalized, and whether the child had been hospitalized before [3,12].

2.3.2. Intolerance of uncertainty scale (IUS-12)

The Intolerance of Uncertainty Scale was developed by Carleton et al. (2007), and the Turkish validity and reliability study of the short form was conducted by Sarıçam et al. [13]. The scale consists of 12 items and uses a 5-point Likert-type format. The total score on the Intolerance of Uncertainty Scale ranges from 12 to 60, with higher scores indicating greater intolerance of uncertainty. The Cronbach's alpha coefficient for internal consistency of the scale was found to be .88 for the overall scale, .84 for the prospective anxiety subscale, and .77 for the inhibitory anxiety subscale [13]. In this study, Cronbach's alpha coefficient was found to be .87 for the IUS-12.

2.3.3. Depression, anxiety, and stress scale-21 (DASS-21)

The DASS-21 was created by shortening the DASS-42 developed by Lovibond and Lovibond (1995). The psychometric properties of the Turkish version of the DASS-21 in both normal and clinical samples were assessed by Sarıçam [14]. The DASS-21 is a 4-point Likert-type scale that

consists of 7 items each to measure depression, anxiety, and stress dimensions. In the clinical sample, the Cronbach's alpha internal consistency reliability coefficients were found to be α=.87 for the depression subscale, α=.85 for the anxiety subscale, and α=.81 for the stress subscale [14]. In this study, Cronbach's alpha coefficient was found to be **.**89 for the Depression subscale, .85 for the Anxiety subscale, and **.**84 for the Stress subscale of the DASS-21, indicating good internal consistency.

2.4. Variables

Dependent variables: Intolerance of Uncertainty, depression, stress, anxiety.
Independent variables: Sociodemographic characteristics of participant.

2.5. Ethical Considerations

The ethical approval for the study was obtained from the Non-Interventional Clinical Research Ethics Committee of Van Yüzüncü Yıl University on March 17, 2023, with approval number 2023/03-02. Written permission was also obtained from the Van Training and Research Hospital Directorate and the Van Provincial Health Directorate. In accordance with the relevant provisions of the Helsinki Declaration, detailed information was provided to all participants and their relatives, and verbal and written consent was obtained.

2.6. Procedure

Before the interviews, participants signed an informed consent form. The personal information form and scales used for data collection were based on self-reports. Data was collected through face-to-face interviews. Parents were informed about the research, and those who volunteered were given the data collection tools to complete. Data were collected from the accompanying parents (mother or father) of hospitalized children using self-administered questionnaires. The total duration of the interview for each participant ranged from 15 to 20 minutes.

2.7. Data Analysis

Descriptive statistics were used for categorical variables and expressed as frequency and percentage. The normality of continuous variables was tested using the Shapiro-Wilk or Kolmogorov-Smirnov tests. In cases where continuous variables followed a normal distribution (parametric), independent group comparisons were performed using the Independent t-test. When the parametric assumptions were not met, the variables were compared using the Mann-Whitney U test. Pearson's correlation coefficient was used to assess the strength and direction of the linear relationships between continuous variables, such as the scores on the IUS-12, DASS-21 subscales (depression, anxiety, and stress), and sociodemographic variables. To examine the relationships between independent and dependent variables, linear multiple regression analysis was conducted. The analysis aimed to assess how independent variables (e.g., intolerance of uncertainty) influenced the dependent variables (e.g. depression, anxiety, stress). The model included all relevant predictors, and assumptions such as multicollinearity, homoscedasticity, and normality of residuals were checked before proceeding with the analysis. The significance level for statistical tests was set at 5%, and all calculations were performed using the SPSS (version 24) statistical software

2.8. Limitations of the study

The study's strength lies in its multidimensional assessment of the factors influencing intolerance of uncertainty, depression, anxiety, and stress in parents of children with chronic and acute illnesses. However, several limitations should be acknowledged. First, the cross-sectional design prevents the establishment of causal relationships between the variables. Second, as the data were self-reported, social desirability or recall biases may have influenced the responses. Third, the sample was drawn from a single center, which limits the generalizability of the findings. Additionally, the majority of participants were mothers, which restricts the ability to generalize

the findings to fathers or other caregivers. The study also did not control for variables such as previous psychiatric history, access to psychosocial support, or the severity/type of the child's illness, all of which may significantly influence the parents' psychological state. Furthermore, while socioeconomic status was recorded, a more nuanced analysis of financial stressors was not conducted.

3. RESULTS

3.1. Sociodemographic Characteristics of Participants

The sociodemographic characteristics of the participants are presented in Table 1. The average age of the participants was 28.80±6.27, with the majority being female (n=132) and married (99.3%, n=146). 29.9% of the participants (n=44) completed primary school. 87.1% (n=128) were not employed, and 50.3% (n=74) reported that their income matched their expenses. 12.2% (n=18) of the participants had chronic illnesses, and among them, 2.7% (n=4) had psychological disorders, and 10.9% (n=16) were using medication. The number of children of the participants ranged from 1 to 9 (2.21±1.35), and 21.8% (n=32) of them had someone else at home assisting with childcare. 17.7% (n=26) of the participants were responsible for caring for individuals other than their children. Regarding the hospitalized children, 85% (n=125) were hospitalized due to acute illnesses, while 15% (n=22) had chronic illnesses. The length of hospitalization ranged from 7 to 120 days (10.83±13.85).

Table 1. Sociodemographic characteristics of participants

Variables	**Mean-SD**	**(min-max)**		
Age of Parents	28.80±6.27	19-54		
Number of Children	2.21±1.35	1-9		
Length of Hospitalization	10.83±13.85	7-120		
Age of Children			**N**	**%**
0-2 years old			112	76.2
3-6 years old			25	17.0
7-9 years old			6	4.1
Over 10 years old			4	2.7
Gender				
Female			132	89.8
Male			15	10.2
Economic Status				
Income< expenditure			57	38.8
Income=expenditure			74	50.3
Income>expenditure			16	10.9
Education Status				

Primary School	44	29.9
Secondary School	39	26.5
High School	39	26.5
University	23	15.6
Postgraduate	2	1.4
Employment Status		
Yes	19	12.9
No	128	87.1
Marital Status		
Married	146	99.3
Single	1	0.7
The Presence of Caregiver		
Yes	32	21.8
No	115	78.2
Presence of Dependents at Home		
Yes	26	17.7
No	121	82.3
Chronic Disease Status		
Yes	18	12.2
No	129	87.8
Medication Use		
Yes	16	10.9
No	131	89.1
Presence of Psychological Illness		
Yes	4	2.7
No	143	97.3
Child's Illness Status		
Acute	125	85.0
Chronic	22	15
Previous Hospitalization Status		
Yes	83	56.5
No	64	43.5

Sd:standart deviation, min: minimum, max: maximum

3.2. Descriptive Findings on Intolerance of Uncertainty, Depression, Anxiety and Stress

The mean scores for depression, anxiety, stress, and intolerance of uncertainty and its subscales are summarized in Table 3. DASS-21 consists of 21 items rated on a 4-point Likert scale, with subscale scores ranging from 0 to 21. The mean scores were as follows: depression, 5.26±4.38 (range: 0–21); anxiety, 4.57±4.17 (range: 0–20); and stress, 5.15±3.63 (range: 0–15).

The Intolerance of Uncertainty Scale–12 (IUS-12) is a 5-point Likert-type scale with total scores ranging from 12 to 60. The mean score for the prospective anxiety subscale was 20.79±6.11 (range: 7–35), for inhibitory anxiety 13.30±5.65 (range: 5–25), and for the total IUS score 34.10±10.61 (range: 12–55).

Regarding severity classifications based on the DASS-21 cut-off points, 19.0% of the participants experienced mild depression, 19.0% moderate, 6.8% severe, and 6.1% extremely severe depression. In terms of anxiety, 23.8% reported mild levels, 12.2% moderate, 4.8% severe, and 12.2% extremely severe anxiety. As for stress, 11.6% experienced mildness, 7.5% moderate, and 5.4% severe stress.

Table 2. The mean score of the depression, stress, anxiety and uncertainty intolererance

	Mean±SD	**(Min-Max)**
Depression	5.26±4.38	(0-21)
Anxiety	4.57±4.17	(0-20)
Stress	5.15±3.63	(0-15)
Forward Anxiety	20.79±6.11	(7-35)
Inhibitory Anxiety	13.30±5.65	(5-25)
IUS-12 Total	34.10±10.61	(12-55)

Sd:standart deviation, min: minimum, max: maximum

Table 3. Frequency of depression, stress and anxiety among participants

		Frequency	Percent
Depression	Normally	72	49.0
	Mild	28	19.0
	Moderate	28	19.0
	Severe	10	6.8
	Extreme severe	9	6.1
Anxiety	Normally	69	46.9
	Mild	35	23.8
	Moderate	18	12.2
	Severe	7	4.8
	Extreme severe	18	12.2
Stress	Normally	111	75.5
	Mild	17	11.6
	Moderate	11	7.5
	Severe	8	5.4
	Extreme severe	147	100.0

3.3. Differences in Depression, Anxiety, Stress, and Intolerance of Uncertainty According to Sociodemographic Variables

The differences in mean scores of the DASS-21 and Intolerance of Uncertainty Scale according to sociodemographic variables (age, gender, education level, marital status, economic status,

employment status, presence of chronic illness, medication use, presence of another caregiver for the child, caregiving responsibility at home, child's age, type of illness, and previous hospitalization) are presented in Table 2.

The depression ($Z = -2.834$; $p < 0.05$), anxiety ($Z = -3.060$; $p < 0.05$), and stress ($Z = -2.096$; $p < 0.05$) scores of female participants were found to be significantly higher than those of male participants. Pairwise comparisons indicated that participants who had completed high school reported significantly higher inhibitory anxiety scores compared to those with only primary school education ($Z = -2.360$; $p = 0.018$). Similarly, high school graduates had significantly higher depression ($Z = -3.379$; $p < 0.01$), anxiety ($Z = -2.740$; $p = 0.006$), and stress ($Z = -2.917$; $p = 0.010$) scores than primary school graduates.

Participants with chronic illnesses reported significantly higher depression ($Z = -2.380$; $p < 0.05$), anxiety ($Z = -3.871$; $p < 0.05$), and stress ($Z = -2.951$; $p < 0.05$) scores than those without chronic illnesses. Likewise, those using medication for chronic illness had significantly higher depression ($Z = -2.589$; $p < 0.05$), anxiety ($Z = -2.580$; $p < 0.05$), and stress ($Z = -2.747$; $p < 0.05$) scores than those not using medication.

Parents of children with chronic illnesses reported significantly higher levels of depression ($Z = -2.050$; $p < 0.05$), anxiety ($Z = -2.502$; $p < 0.05$), and stress ($Z = -2.290$; $p < 0.05$) compared to parents of children with acute conditions. Furthermore, participants whose children had been previously hospitalized had significantly higher stress scores ($Z = -2.010$; $p < 0.05$) than those whose children had not been hospitalized.

Table 4. Socio-demographic differences in depression, anxiety, stress, and intolerance of uncertainty

Variable	Depression	Anxiety	Stress	Prospective Anxiety	Inhibitory Anxiety	Total IUS-12
Gender						
Female	77.34	77.60	76.47	75.56	74.38	75.24
Male	44.60	42.30	52.27	60.30	70.63	63.07
Z	-2.834	-3.060	-2.096	-1.317	-0.324	-1.050
p	0.005	0.002	0.036	0.188	0.746	0.294
Education Level						
Primary School[a]	72.27	74.99	65.23	71.60	73.72	72.63
Secondary School[b]	54.35	57.06	60.87	63.31	59.94	61.29
High School[c]	86.69	83.22	87.95	81.46	90.45	86.81
University[d]	87.90	84.30	88.16	83.26	70.78	76.26
F	14.63	9.58	12.64	4.99	10.25	7.12
p	0.002 c>a	0.022 c>a	0.005 c>a	0.172 c>a	0.017	0.068
Employment Status						
Employed	62.55	64.68	65.55	77.03	75.05	75.76
Unemployed	75.70	75.38	75.25	73.55	73.84	73.74
Z	-1.261	-1.028	-0.931	-0.333	-0.116	-0.194
p	0.207	0.304	0.352	0.740	0.908	0.847
Caregiver Presence						
Yes	67.56	63.31	70.80	72.44	68.11	69.75
No	75.17	76.36	74.26	73.80	75.01	74.55
Z	-0.903	-1.551	-0.411	-0.161	-0.817	-0.568
p	0.367	0.121	0.681	0.872	0.414	0.570
Chronic Disease Status						
Yes	96.28	110.19	101.61	77.19	83.03	81.36
No	70.89	68.95	70.15	73.55	72.74	72.97

Z	-2.380	-3.871	-2.951	-0.340	-0.962	-0.783
p	0.017	0.000	0.003	0.734	0.336	0.433
Medication Use Status						
Yes	99.91	99.78	101.47	63.59	70.53	66.81
No	70.84	70.85	70.65	75.27	74.42	74.88
Z	-2.589	-2.580	-2.747	-1.037	-0.346	-0.716
p	0.010	0.010	0.006	0.300	0.730	0.474
Child's Illness Status						
Acute	70.15	69.53	69.82	71.95	73.38	72.69
Chronic	90.80	94.70	92.88	79.55	70.65	74.95
Z	-2.050	-2.502	-2.290	-0.752	-0.270	-0.224
p	0.040	0.012	0.022	0.452	0.787	0.823
Previous Hospitalization						
Yes	77.04	77.05	80.17	74.59	70.45	72.48
No	70.05	70.05	66.00	73.23	78.61	75.98
Z	-0.991	-0.994	-2.010	-0.192	-1.154	-0.494
p	0.322	0.320	0.044	0.848	0.248	0.621
Income Level						
Income < Expenses	75.09	73.40	74.31	67.77	65.93	66.25
Income = Expenses	75.42	78.09	77.13	81.18	81.97	82.17
Income > Expenses	63.56	57.22	58.44	62.97	65.88	63.84
p	0.580	0.201	0.277	0.110	0.073	0.063
Child's Age						
0-2 years	72.88	71.29	72.54	71.98	71.74	71.41
2-6 years	84.14	83.98	86.60	83.48	82.92	85.26
6-10 years	61.15	79.45	58.80	72.95	77.05	74.90
p	0.297	0.365	0.163	0.472	0.480	0.338

Z: Mann Whitney U test, F: Kruskal Wallis Test

3.4. Relations Between Scale Scores and Sociodemographic Variables

The correlations between the scale scores and sociodemographic variables are presented in Table 4. A strong positive correlation was found between parental age and the number of children (r = 0.548). There was also a strong positive correlation between prospective anxiety and inhibitory anxiety (r = 0.626), and between prospective anxiety and overall intolerance of uncertainty (r = 0.910). Prospective anxiety showed a weak positive correlation with both depression (r = 0.284) and stress (r = 0.284).

Inhibitory anxiety was strongly correlated with overall intolerance of uncertainty (r = 0.893), while it was weakly correlated with depression (r = 0.424), anxiety (r = 0.283), and stress (r = 0.329). Intolerance of uncertainty showed weak positive correlations with depression (r = 0.389), anxiety (r = 0.246), and stress (r = 0.339). Additionally, there was a strong positive correlation between depression and anxiety (r = 0.769).

Table 5. Correlation matrix of study variables

	1	2	3	4	5	6	7	8	9
Age	1								
Length of hospitalization	-.064	1							
Number of Children	**.548****	.026	1						

Prospective Anxiety	-.040	.116	-.028	1					
Inhibitory Anxiety	-.035	.093	.064	**.626****	1				
IUS-12 Total	-.042	.117	.018	**.910****	**.893****	1			
Depression	-.103	.157	.086	**.284****	**.424****	**.389****	1		
Anxiety	-.061	.108	-.018	.165*	**.283****	**.246****	**.769****	1	
Stress	-.102	.052	-.069	**.284****	**.329****	**.339****	.690****	.671****	1

***. Correlation is significant at the 0.01 level (2-tailed).*
**. Correlation is significant at the 0.05 level (2-tailed).*

3.5. Regression Analysis Results

Three models were created to examine the predictive role of intolerance of uncertainty in depression, stress, and anxiety. The results of the simple linear regression analysis indicated that all three models were statistically significant.

1. **Stress Model:** Intolerance of uncertainty explained 10% of the variance in stress (F: 18.814; $p<0.01$). In this model, intolerance of uncertainty was found to be a significant predictor of stress ($p<0.01$).
2. **Depression Model:** Intolerance of uncertainty explained 14% of the variance in depression (F: 25.930; $p<0.01$). In this model, intolerance of uncertainty was found to be a significant predictor of depression ($p<0.01$).
3. **Anxiety Model:** Intolerance of uncertainty explained 5% of the variance in anxiety (F: 9.303; $p<0.01$). In this model, intolerance of uncertainty was found to be a significant predictor of anxiety ($p<0.01$)

Table 6. Regression analysis between DASS-21 and intolerance of uncertainty scales

Dependent Variable	**Predictor**	β (Standardized)	B (Unstandardized)	SE	t	p	Adjusted R^2
Stress	(IUS-12 Total)	0.339	0.116	0.027	4.34	<0.001	0.109
Depression	(IUS-12 Total)	0.389	0.161	0.032	5.09	<0.001	0.146
Anxiety	(IUS-12 Total)	0.246	0.097	0.032	3.05	0.003	0.054

4. DISCUSSION

This study set out to examine the levels of intolerance of uncertainty, stress, anxiety, and depression among parents of children hospitalized for extended periods; to explore differences in these variables based on sociodemographic characteristics; and to investigate the nature and predictive role of intolerance of uncertainty in relation to psychological distress. The findings provide important insights into how uncertainty contributes to the emotional well-being of parents in pediatric hospital settings. The connection between intolerance of uncertainty and mental health outcomes, particularly depression, anxiety, and stress in parents of hospitalized children, has become a critical area of research in recent years. Parents of hospitalized children often face significant emotional distress, worsened by uncertainty regarding their child's health condition. This uncertainty can manifest as heightened feelings of anxiety and depression, leading to negative mental health outcomes. Furthermore, the inability to make future plans and the lack of clarity can increase anxiety levels [1]. Individuals with higher intolerance of uncertainty are more affected by uncertain situations compared to those with lower levels. As intolerance of uncertainty increases, individuals may become more vulnerable to psychological disorders [15]. Previous studies have emphasized that intolerance of uncertainty in parents is related to anxiety disorders and can lead to a cycle of heightened worry and hypervigilance [16,17]. In our study, intolerance of uncertainty

was found to be a significant predictor of depression, anxiety, and stress (p<.01). The parents in our study had an average score of 34.10±10.61 for intolerance of uncertainty, with average subscale scores of 20.79±6.11 for future-related anxiety, 13.30±5.65 for blocking anxiety, 5.26±4.38 for depression, 4.57±4.17 for anxiety, and 5.15±3.63 for stress. It was determined that the parents in the study experienced moderate levels of intolerance of uncertainty. In another study, parents of children with chronic illnesses were found to have moderate levels of intolerance of uncertainty (38.84±10.04), which aligns with our findings [18]. Higher scores on the scale reflect an increase in the level of intolerance of uncertainty among parents.

Recent studies further underline the significance of intolerance of uncertainty as a key predictor of emotional distress among caregivers [19]. High IU levels in parents during their child's hospitalization were associated with elevated depressive symptoms and maladaptive coping strategies, particularly in contexts with prolonged treatment uncertainty. Similarly, inhibitory anxiety component of IU significantly predicted parenting stress and disrupted family functioning among parents of children undergoing intensive care. These findings support our regression results indicating that IU explains a considerable portion of the variance in parental depression, anxiety, and stress. Furthermore, recent pandemic-related literature has emphasized how external stressors, such as hospital visitation restrictions and medical uncertainty, have intensified psychological distress among caregivers [20]. Our results align with this body of work and suggest that psychosocial interventions targeting IU—such as uncertainty tolerance training or cognitive-behavioral strategies—may improve emotional outcomes among parents navigating pediatric hospitalizations.

Our study also found that mothers had statistically significantly higher levels of depression, anxiety, and stress compared to fathers (p<.05). Since the primary caregiver for hospitalized children is often the mother, she is typically more affected by the child’s illness. Additionally, gender is a major risk factor for the development of depression. Anxiety and depression are more common in women than in men. Women's biological and personality traits, mental health characteristics, societal and cultural roles, and coping strategies predispose them to depression. Several studies [21] show that mothers of children with chronic illnesses tend to exhibit higher levels of depression and anxiety than fathers, which supports our finding. Similarly, studies have reported that mothers of children undergoing surgery experience higher levels of anxiety and depression compared to fathers [22,23]. In another study, the anxiety and depression levels of mothers were found to be higher during the care of adolescents with asthma [24]. Norberg et al. [25] also observed that mothers of children undergoing cancer treatment had higher anxiety levels compared to fathers. Literature examples support our findings, highlighting the increased levels of anxiety and depression in mothers caring for sick children. In contrast to these findings, Çiftçi et al. [26] reported that parents, regardless of gender, experienced moderate levels of anxiety. Similarly, in a study by Tuna et al. [27], no significant difference was found in depression, hopelessness, and anxiety scores between parents of hospitalized children. Compassion, sacrifice, and self-neglect were found to be more prevalent in mothers, though perceived stress, anxiety, and caregiving burden were reported to be similar for both mothers and fathers. Moreover, the reduction in fathers’ professional and social activities was also noted [26]. The literature contains both supporting and contradicting findings to our study. Some studies report no impact of parent age on anxiety [28] or depression, while others indicate that older mothers tend to experience higher anxiety levels [29]. One study even found that increased age in fathers was associated with lower anxiety scores. In our study, parent age did not significantly affect depression, anxiety, or stress levels (p>.05) [28].

Education level of the parents was found to affect their levels of depression, anxiety, and stress. Parents with a high school education exhibited higher levels of depression, anxiety, and stress

compared to those with only a primary school education (p<.05). In a study by Aykent et al. [30], individuals with higher education levels had higher anxiety scores than those with lower education levels. While similar findings are reported in the literature, other studies present different conclusions. In contrast to our results, Çalınık [31] found that mothers of children with immunodeficiency who had higher education levels exhibited better spiritual well-being. A study by Çelik and Acar [32] reported that those with lower education levels had higher depression and anxiety scores compared to those with a high school diploma or higher.

The study found that mothers with a diagnosed chronic illness or psychiatric disorder who were taking medication exhibited statistically significant differences in their depression and anxiety levels (p<.05). Anxiety and depression are common in individuals with psychiatric disorders. Factors such as parent age, child age, employment status, marital status, family income, number of children, and the presence of other dependent family members were not significantly related to intolerance of uncertainty, depression, anxiety, or stress levels (p>.05).

Our study also found a significant relationship between hospitalization experience and stress levels (p<.05). Literature summarizing previous studies on parents of children with chronic illnesses suggests that previous hospitalizations are correlated with increased stress, anxiety, and depression [25,33]. Similar to our findings, recurring hospitalizations appear to contribute to higher levels of stress, anxiety, and depression in parents. Parents experience uncertainty, stress, and fear related to their child's diagnosis and treatment. The lack of information and control regarding their child's condition further heightens their anxiety and fear levels. Intolerance of uncertainty, often associated with psychological distress, is common in families of children with chronic illnesses [34]. Our findings suggest that parents of children with chronic conditions report higher levels of depression, anxiety, and stress compared to those with acutely ill children (p<.05). Literature reflects similar findings, although some studies report differing conclusions. Taşdelen [35] suggested that anxiety levels are higher in parents of children hospitalized for acute conditions compared to those with chronic conditions.

5. CONCLUSION

This study demonstrates that parents of hospitalized children experience considerable levels of psychological distress, including symptoms of depression, anxiety, and stress. Although mean scores for these symptoms remained within the mild range, a noteworthy proportion of parents reported clinically significant levels of distress: 19% exhibited mild to moderate depression, while 12.9% experienced severe or extremely severe depressive symptoms. Furthermore, participants showed moderate to high levels of intolerance of uncertainty, as reflected in elevated prospective and inhibitory anxiety scores. These findings highlight the substantial psychological burden faced by parents during their child's hospitalization, particularly in contexts where hospitalization is prolonged and unpredictable. Intolerance of uncertainty appears to be a key factor exacerbating emotional distress, supporting previous literature that links uncertainty with poorer mental health outcomes.

Given these results, it is essential that healthcare professionals, especially nurses and psychosocial support staff, recognize the emotional needs of parents in pediatric care settings. Early identification of distress and intolerance of uncertainty, along with the implementation of supportive interventions—such as counseling, psychoeducation, and emotional support groups—could enhance parents' coping capacity. Creating hospital environments where parents are informed, emotionally supported, and actively engaged in the care process may help alleviate the psychological impact of hospitalization.

Future research should examine the long-term psychological effects of pediatric hospitalization on caregivers and explore the effectiveness of interventions aimed at reducing intolerance of uncertainty and strengthening resilience in parents.

Conflict of Interest
The authors declare that they have no conflict of interest.

Authors' Contributions
Nurdane GÖKTÜRK: Literature research, conducting the research, writing the article
Cemile Hürrem AYHAN: Creation of the method, writing of the article, statistical analysis of the study
Mehmet Cihad AKTAŞ: Creation of the method, statistical analysis of the study
Sakine AKTAŞ: Literature research

Ethics Committee Declaration

After the approval of the research ethics committee was obtained from Van Yüzüncü Yıl University Non-Interventional Clinical Research Ethics Committee dated 17.03.2023 and numbered 2023/03-02, written permission was obtained from Van Education and Research Hospital Chief Physician's Office and Van Provincial Health Directorate where the research would be conducted. In accordance with the relevant articles of the Helsinki Declaration, all patients and their relatives participating in the study were given detailed information about the study and verbal and written consent was obtained from the participants.

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