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ORIGINAL ARTICLE

Post-Traumatic Stress Disorder in Parents and Children After Discharge From the Pediatric Intensive Care Unit

Pediatri Yoğun Bakım Ünitesinden Taburcu Olan Çocuk ve Ebeveynlerinde Travma Sonrası Stres Bozukluğunun Değerlendirilmesi

[1]Aysegul Karaca, [2]Ayfer Acıkgoz

[1]Hacettepe University, Faculty of Medicine, İhsan Doğramacı Children's Hospital, Ankara
[2]Eskişehir Osmangazi University, Department of Child Health Nursing, Eskisehir

Correspondence

Aysegul Karaca, Hacettepe University, Faculty of Medicine, İhsan Doğramacı Children's Hospital, Ankara, Turkey.

E-Mail: aysegulkaraca_88@hotmail.com

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ABSTRACT

Background/Aims: This study was conducted to determine the development of post-traumatic stress disorder (PTSD) in children ,who had spent time in an intensive care unit, as well as in their parents.
Methods: The study was a cross-sectional study. 110 children, 98 mothers and 80 fathers were included in the study.
Results: The average PTSD score was 34.46±15.89 in children , 53.66±16.93 in mothers, and 33.24±14.61 in fathers. A positive relationship was found between the PTSD scores of the children, mothers and fathers (p<0.05).
Conclusion: The study found that PTSD could develop in children and their parents after the children had been hospitalized in intensive care.

Keywords: Child, Intensive Care, Parent, PTSD

ÖZ

Amaç: Çalışma, yoğun bakım ünitesinde yatmış 8-12 yaş arası çocuklar ve ebeveynlerinde TSSB (Travma Sonrası Stres Bozukluğu) gelişimini belirlemek amacıyla yapıldı.
Yöntem: Kesitsel tipte bir çalışmadır. Çalışmaya 110 çocuk, 98 anne ve 80 baba dahil edildi.
Bulgular: Çocuklarda TSSB puanı ortalaması 34,46±15,89, annelerde 53,66±16,93, babalarda 33,24±14,61 olarak bulundu. Çocuk, anne ve babanın TSSB puanları arasında pozitif yönde ilişki saptandı (p<0,05).
Sonuç: Çalışma sonucunda yoğun bakımda yatan çocuklarda ve ebeveynlerinde TSSB gelişebildiği görüldü.

Anahtar Kelimeler: Çocuk, Yoğun Bakım, Aile, TSSB

Introduction

Traumatic experiences are defined as events experienced or witnessed by a person, in which real death or a death threat exists and a severe injury or threat against physical integrity emerges. In other words any traumatic experience occurring in a person's life affects not only the person himself/ herself, but also the people he/she interacts with (1). Many mental disorders may develop after trauma. Acute stress disorder (ASD), which is considered an adjustment disorder (2), and post traumatic stress disorder (PTSD) (3) are two of these. ASD is the name given to the condition that occurs between three days to one month after encountering a traumatic stressor (2). If symptoms persist after 30 days, a diagnosis of PTSD is made (3).

Flood, earthquake, fire, traffic accidents, wars, accidents, domestic violence, assault, rape, torture, incest and migration, which are encountered in human life, can be given as examples to events causing mental trauma (1). Another major cause of the trauma is hospitalization, especially being hospitalized in an intensive care unit. When the hospitalised person is a child, this experience can be a source of stress, trauma and PTSD for both families and children (4). In other words, if the disorders that occur immediately after the trauma are not treated, they may become chronic and become severe health problems. Healthcare professionals should therefore remember that there a risk of PTSD in children who have been admitted into pediatric intensive care units (PICU), as well as in their families.

Among healthcare professionals, nurses in particular have the opportunity to observe and care for a child 24 hours a day. From the first moment the child is admitted to the unit, pediatric nurses ought to adopt a patient and family centred atraumatic care approach to prevent the development of PTSD. The attempt should be made to reduce all negative impacts as much as possible. For this purpose, the child and the family should be informed about the interventions being made and they should be included in the decision-making process as much as possible. The child's pain should be assessed and appropriate treatment should be provided. The effect of the intensive care environment on the child's sleep pattern should be evaluated, and measures should be taken so that they can maintain a regular sleep pattern. The environment, people and procedures of the PICU can cause anxiety and fear in

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Complaints: geneltip@selcuk.edu.tr

the child and the family (5). Relieving them of these feelings reduces the risk that stress disorders may develop. Children and families experiencing intensive care should be assessed for PTSD and early treatment should be provided if it is diagnosed. It is also important to determine the risk factors that for stress disorders by conducting studies with children who have been hospitalized and their parents.

The study was conducted to determine PTSD in children between the ages of 8 and 12, who had been discharged from a PICU and/or transferred to the unit, and their parents.

Methods

Type of study

The study was a cross-sectional study.

Place and time of study

The research was carried out in the intensive care unit of a Children's Hospital in Ankara/Turkiye between January 1, 2019 and March 1, 2019.

Study sample

Children between the ages of 8 and 12, who had spent time in the PICU, who had been discharged from the PICU or transferred into another unit during this period, and who met the research criteria were included in the study. Between these dates, the total number of children discharged from intensive care or transferred into another unit was 166. 138 of them were between 8 and 12 years old. During this period, three children who died, two children whose general condition meant they were unable to participate in the study, and 23 children from whose parents consent could not be obtained were excluded from the study. For these reasons, the study was completed with 110 children. In addition, the parents of the children in the sample group (98 mothers and 80 fathers) who were alive, reachable, and who agreed to participate were included in the study.

The inclusion criteria in the study were as follows:

- The child was between 8 and 12 years old,

- The child had an adult companion with them,

- The child was conscious and/or able to communicate verbally,

- The child did not have any mental disabilities,

- There were no challenges in communicating with the family and/or the child (i.e. they spoke Turkish, were able to communicate),

- The child's stay at PICU was no longer than 29 days,

- The child and their family volunteered to participate in the study

In the power analysis conducted using the G*power 3.0.10 program and an alpha=0.05 margin of error, the power of the study was 85% for 110 children, 93.3% for the 98 mothers and 81.5% for the 80 fathers.

Data collection forms and data collection

The Personal Data Collection Form, the PTSD Question List Civilian Version and the Post-Traumatic Stress Response Scale were used to collect data in the study.

Data collection form

The data collection form was prepared by researchers in line with the literatüre (2, 6). The data collection form included questions about the characteristics of the child, their mothers and fathers and their hospital experience.

PTSD Question List Civilian Version

This form was used in the study to determine the PTSD levels of the mothers and fathers. The scale was developed by Weathers et al. (7) and the scale was adapted into Turkish by Kocabaşoğlu et al. (8) It is a self-report scale consisting of 17 items containing three sets of symptoms. Seven of the items are about the symptoms of avoidance, five of them are about overstimulation and five of them are about re-experiencing events. Scoring is done on a six-point scale ranging from 0 (none at all) to 5 (extremely). A total score of 50 or above is sufficient for a diagnosis of PTSD. The PTSD scale is considered a diagnostic scale which allows all the symptoms inthe DSM-IV (3) to be evaluated. The cut-off score of the scale was determined as 22/23. The Cronbach's alpha coefficient is 0.922 (8). The PTSD Question List Civilian Version was administered to the parents between the 30th and 40th days after the child had been discharged or transferred into another unit.

Post-Traumatic Stress Response Scale

This scale was developed by Pynoos et al. (9) to assess stress reactions in children and adolescents after various traumatic experiences. The scale was adapted into Turkish by Erden et al. The Cronbach's alpha coefficient of the scale is 0.75 (10). The scale contains 20 items that are filled in by interviewing children face-to-face. The scale is a five-point Likert-type scale with scoring ranging from "none at all" to "most of the time". A score of between 12 and 24 in the total scale is interpreted as "Mild PTSD", between 25 and 39 as "Moderate PTSD", between 40 and 59 as "Severe PTSD", and 60 and above as "Very Severe PTSD" (10). In the study, the Post Traumatic Stress Response Scale was applied to the child by the researcher between the 30th and 40th days after the child had been discharged or transferred to another unit.

Data Analyses

Statistical analysis was conducted using the SPSS (IBM SPSS Statistics 22) package program. Frequency tables and descriptive statistics were used to interpret the findings. Parametric methods were used for values suitable for normal distribution. In accordance with the parametric methods, the independent samples test (t-table value) method was used to compare the values of two independent groups. The ANOVA test (F-table value) method was used to compare the values of three or more independent groups. For paired

Table 1. Comparison of descriptive characteristics of the children and their PTSD scores (n=110)

Variable		n	PTSDScore			**Statistical analysis
			$\bar{X}$±S.S.	Median [IQR]		
Child's age	8	12	38.83±19.64	9.0 [27.5]		F=0.951 p=0.438
	9	7	34.71±18.30	36.0 [40.0]		
	10	18	28.12±10.76	29.0 [18.0]		
	11	14	34.57±20.55	29.0 [29.3]		
	12	59	35.38±14.77	34.0 [20.0]		
Child's gender	Girl	48	34.35±14.89	33.0 [21.5]		t=-0.067 p=0.947
	Boy	62	34.56±16.74	34.0 [21.5]		
Number of siblings	None	13	28.38±12.22	28.0 [14.5]		F=1.010 p=0.391
	1	51	34.34±13.55	34.0 [16.8]		
	2	28	37.77±18.51	35.5 [33.8]		
	3 or more	18	34.44±19.78	33.0 [30.0]		
Family income status according to the child	Income is more than the expenditure	51	34.98±17.48	33.0 [23.0]		Z=-0.031 p=0.975
	Income is equal to or lower than expenditure	59	34.03±14.56	34.0 [22.0]		
Diagnosis	Acute disease	47	32.76±15.48	34.0 [25.0]		Z=-0.617 p=0.537
	Chronic disease	63	35.75±16.21	33.0 [19.5]		
Length of stay in PICU	1 or less	36	33.97±17.83	29.0[25.3]		χ^2=5.460 p=0.141
	2-5	49	31.92±14.57	32.5[19.5]		
	6-9	11	40.82±13.30	38.0[13.0]		
	10 or more	14	40.33±15.76	40.0[22.8]		
Person with the child in the PICU	Mother	90	35.03±16.03	34.0[22.0]		F=0.417 p=0.660
	Father	13	33.31±15.92	33.0[21.5]		
	*Other	7	29.57±15.41	28.0[15.0]		

*Other: Babysitter, aunt etc.** "Independent Sample-t" test, "ANOVA" test and Tukey test were applied for measurement values suitable for normal distribution. "Mann-Whitney U" and "Kruskal-Wallis H" test methods were used for measurement values that were not in accordance with the normal distribution.

Table 2. Comparison of descriptive characteristics of the parents and their PTSD scores (n=98 mothers, n=80 fathers)

Variable		n	PTSDScore			Statistical analysis
			$\bar{X}$±S.S.	Median [IQR]		
Mother's age [x̄±S.S. →39,20±5,67(years)]	41 and under	63	53.65±16.02	55.0 [25.5]		t=-0.008 p=0.993
	42 and over	35	53.69±18.66	54.0 [33.0]		
Mother's education level	Primary education and below	42	54.22±16.08	54.0 [28.0]		F=0.224 p=0.800
	Secondary education and above	29	54.59±18.54	55.0 [27.5]		
	University and above	27	51.77±16.99	57.0 [26.3]		
Employment status of the mother	Employed	35	55.81±17.76	59.0 [29.0]		t=0.900 p=0.370
	Unemployed	63	52.54±16.52	51.0 [26.0]		
Family's income status according to the mother	Income> expenditure(1)	12	42.42±16.63	39.5 [29.8]		F=3.278 **p=0.042** **[3>1]**
	Income = expenditure(2)	62	54.75±15.98	55.0 [23.8]		
	Income < expenditure(3)	24	56.58±17.84	57.0 [31.5]		
Father'sage [x̄±S.S. →44,35±6,16(yıl)]	41 and under	26	33.96±15.58	31.0 [25.3]		Z=-0.138 p=0.890
	42 and above	54	33.23±14.28	31.0 [23.0]		
Father's education level	Primary education and below	24	34.00±16.74	31.5 [29.8]		χ^2=0.023 p=0.989
	Secondary	22	31.81±11.63	31.0 [13.0]		
	University and above	34	33.61±15.05	32.0 [25.5]		
Employment status of the father	Employed	64	33.39±15.5	31.0 [28.3]		Z=-0.311 p=0.756
	Unemployed	16	32.69±10.91	33.5 [13.5]		
Family's income status according to the father	Income >expenditure(1)	12	28.83±14.40	22.5 [19.3]		χ^2=1.554 p=0.460
	Income = expenditure(2)	51	34.20±14.97	32.0 [23.0]		
	Income <expenditure(3)	17	33.59±13.99	34.0 [27.0]		

Table 3. Relationship between PTSD scores of the children, the mothers and the fathers

PTSD Correlation*		Mothers	Fathers	Children
Mothers	r	1.000	0.409	0.443
	p	-	**0.001**	**<0.001**
Fathers	r	0.409	1.000	0.237
	p	**0.001**	-	**0.038**
Children	r	0.443	0.237	1.000
	p	**<0.001**	**0.038**	-

*Pearson/Spearman correlation coefficient

comparisons of variables that differed significantly for three or more groups, the Tukey test was applied giving the homogeneity of variances.

Non-parametric methods were used for values that were not suitable for normal distribution. In accordance with the non-parametric methods, the Mann-Whitney U Test (Z-table value) was used for comparing the values of two independent groups and the Kruskal-Wallis H test (χ2-table value) was used for the comparison of the values of three or more independent groups. Bonferroni correction was applied for paired comparisons of variables that made a significant difference for three or more groups.

The Pearson correlation coefficient was used in examining the relationship between measurement values with normal distribution, the Spearman correlation coefficient was used for those which did not have a normal distribution. The intervals for correlation were 00-0.25 (very weak correlation), 0.26-0.49 (weak correlation), 0.50-0.69 (medium correlation), 0.70-0.89 (high correlation), 0.90-1.0 (very high correlation) (11). In the study $p<0.05$ was considered significant.

Ethical Considerations

Children and parents who had provided their written informed consent were included in the study. Before starting the study, ethical approval was obtained from the Ethics Review Board for Clinical Studies of X University (Date: 12.11.2018; No. 124), and institutional permission was obtained from the hospital where the study was conducted (Date: 06.12.2018). Only voluntary participants were included in the study. At the end of the study, the parents of the children with PTSD were informed and the necessary guidance was provided for them to receive professional support. In addition, the mothers and fathers with PTSD were contacted and it was stated that they should seek out professional support.

Results

110 children, 98 mothers and 80 fathers who agreed to participate in the study, met the sample selection criteria, and were available throughout were included in the study. The average PTSD score of the children was 34.46±15.89 (min. 8; max. 74). Mild PTSD was detected in 34 (31.0%) of the children, moderate in 36 (32.7%), severe in 30 (27.2%) and very severe in 10 (9.1%). The average PTSD score of the mothers was 53.66±16.93 (min. 17; max. 85), and the average PTSD score of the fathers was 33.24±14.61 (min. 17; max. 71). 57 of the mothers (58.1) and 14 of the fathers (18.8%) had a PTSD score of 50 or more.

The characteristics of the children are given in Table 1. There was no significant relationship between these characteristics and the children's PTSD scores ($p>0.05$).

Table 2 presents the characteristics of the parents and their PTSD scores. On the basis of the mothers' statements, there was a statistically significant difference between the family income level and the mother's PTSD score ($p=0,042$). As a result of Tukey paired comparisons made by taking into account the homogeneity of variances, a statistically significant difference was found between those with more income than expenditure and those with less income than expenditure. The PTSD scores of those whose income was higher than their expenditure were statistically significantly lower than those whose income was less than their expenditure. There was no significant relationship between the other characteristics of the mothers and fathers and their PTSD scores ($p>0.05$).

Table 3 shows the relationship between the PTSD scores of the children, mothers and fathers. A positive, weak, and statistically significant relationship was found between the PTSD scores of the mothers, the PTSD scores of the fathers and the PTSD score of the children ($p<0,05$). As the mothers' PTSD scores increased, the fathers' and children's PTSD scores also increased. Likewise, as the mothers' PTSD scores decreased, the PTSD scores of the fathers and the children decreased. A positive, very weak, and statistically significant relationship was found between the fathers' PTSD scores and the children's PTSD scores ($p<0.05$). As the fathers' PTSD scores increased, the children's PTSD scores increased. Likewise, as the fathers' PTSD scores decreased, the children's PTSD scores decreased.

Discussion

This study was conducted to determine PTSD in children who had been hospitalized in a PICU and in their parents. In the literature review, no study could be found in Turkey examining PTSD in children hospitalized in intensive care. In the international literature, there are very few studies on this subject.

In this study the average PTSD score of the children was 34.46±15.89 (min. 8; max. 74). It was determined that 34 of the children (31.0%) had mild PTSD, 36 of them (32.7%) had moderate PTSD, 30 of them (27.2%) had severe PTSD, and 10 of them (9.1%) had very severe PTSD. Children may face various diseases during the course of their development and they may sometimes need to be monitored in hospital, including in a PICU. Hospitalized children may experience increased levels of stress due to fears of physical harm, surgery and the effect of being separated from their families (6). A child who experiences stress due to illness or hospitalisation may feel powerless and helpless if they cannot solve or ameliorate their problems with the methods they have previously learned (6). For this reason, hospitalization is a traumatic event for many children and they may be adversely affected by it (4). A study examined 65 children aged 6 to 13 years who were discharged from PICU and 65 children who were discharged from general services. It was found that the PICU group had a significantly higher PTSD frequency compared to the general service group (84.6% and 6.2%, respectively; $p<0.001$) (12). In a study conducted by Stowman et al. (13), 50 children between the ages of 9 and 17 who had been in a PICU were included, and PTSD was detected in 26% of follow-ups. One cohort study (14) compared patients between the ages of 5 and 8 who had been in a PICU for one year and then discharged with those

who were hospitalized in a general pediatric unit and then discharged. As a result of the study, it was found that the rate of psychological morbidity was higher in the children discharged from the PICU. This shows that the result of this study is similar to those of other studies in the literature. This is important in terms of showing the necessity of screening children in intensive care for PTSD.

In the current study the average PTSD score of the mothers was 53.66±16.93 (min. 17; max. 85), and the average PTSD score of the fathers was 33.24±14.61 (min. 17; max. 71). It was determined that 57 of the mothers (58.1%) and 14 of the fathers (18.8) had a PTSD score of 50 or more, and PTSD was observed. For parents, hospitalization of their childen in intensive care unit (PICU) is a very stressful experience full of anxiety. Parents usually have fear and experience trauma. This stress may lead to PTSD (15). Prevalence rates of PTSD in parents ranged from 8 to 68% (16). In another study of 50 parents whose children were admitted to intensive care, PTSD was detected in 24% of them during follow-up (13). In a study conducted by Masa'deh and Jarrah (17) with parents (207 mothers; 209 fathers) of children diagnosed with cancer, 59.68 (mean) of the mothers and 52.76 (mean) of the fathers were found to have PTSD. In the same study, it was determined that in 79% of cases, there was PTSD in at least one of the parents.

In a study conducted with 117 parents whose children were between the ages of 0 and 18 it was determined that mothers had higher levels of PTSD than fathers (18). Likewise, in the current study, the PTSD scores of the mothers were higher than those of the fathers. These results shows the importance of screening parents, especially mothers whose children have been hospitalized, for PTSD.

The study found that age, gender, number of siblings and family income status did not affect the children's PTSD scores ($p>0.005$). In one study (19) it was determined that the ages of children between 13 and 18 who had been admitted to hospital due to physical trauma, did not affect PTSD. Ay's (19) study concluded that children of all ages were at the risk of PTSD. A study (20) conducted with 249 children between 9 and 12 selected by the random sampling method in Şanlıurfa, showed that gender did not affect the risk of PTSD. A similar result was obtained in a study with high school students (21). Similar to the results of the current study, a study conducted with 35 children between the ages of 8 and 15 who had had a bone marrow transplant determined that there was no relationship between the number of siblings and trauma scores (22). A study on adolescents aged 15-19 found no relationship between income levels and PTSD (23). All these results are similar to the results of the current study and show that these characteristics do not affect the risk of PTSD.

No statistical difference was found in this research between the child's status of having an acute or chronic diagnosis, the length of stay in the PICU or the person accompanying the child and the PTSD scores ($p<0.05$). In the literature review, no study comparing the length of hospitalization and the person accompanying the child with the PTSD scores was found. In a study conducted only with pediatric patients diagnosed with heart disease, it was stated that the risk of PTSD was higher in individuals with chronic diseases (24). Another study with children diagnosed with canceralso supports this study (25). The difference between the results of the current study and the literature may be related to the fact that all the children had the same intensive care experience.

No statistical difference was found in this research between the age, education level, and employment status of mothers and fathers, and the PTSD scores ($p>0.005$). While there was no statistical difference between the fathers' PTSD scores according to the family income ($p>0.005$), it was determined that there was a statistical difference between family income and the mothers' PTSD scores($p=0.042$). As the family's income decreased, the mothers' PTSD scores increased. A study (26) determined that parents whose children were COVID-19 positive, had a higher rate of PTSD. The study also found that patients facing economic losses had a higher rate of anxiety and depressive symptoms and PTSD was more common among the unemployed and mothers.

In a study conducted with families with children aged 9-12 it was stated that as the education levels of the mothers decreased, so the PTSD scores increased, and that there was no significant relationship between the educational status of the fathers and the PTSD scores (20). In our study, unlike in these two studies, there was no relationship between the parents educational status and their PTSD scores. Further research needs to be conducted in order to reach a clear conclusion on this matter.

It has been reported that PTSD is more common in individuals experiencing economic difficulties (27). A study conducted with 117 parents with children between the ages of 0-18 who had been diagnosed with cancer found that parents with a lower income had a higher risk of PTSD (18). The difference between the family income status and the mothers' PTSD scores in the current study can be seen as related to this finding. This result is important in terms of showing that income status is a risk factor for PTSD in women (in this case, the mothers).

The study found that as the PTSD scores of the parents increased, the children's PTSD scores increased, and, likewise, as the PTSD scores of the parents decreased, the PTSD scores of the children decreased. No similar results were found in the literature. Even if parents make an effort to hide it, their restlessness and anxiety can be sensed by their children (28). A child can understands that something is wrong on the basis of their parents' behaviors of their parents. Therefore it is important that both children hospitalized in PICUs and their parents be screened psychologically. It is because these patients are a defenseless population bearing the risk of developing psychiatric response (29).

Conclusion and Suggestions

The study found that mild to very severe PTSD can develop in children hospitalized in a PICU. Likewise, PTSD was detected in 58.1% of the mothers whose children had been in the PICU and in 18.8% of the fathers. It was determined that as the PTSD scores of the mothers and fathers increased, the PTSD scores of the children also increased; when the PTSD scores of the mothers and fathers decreased, the PTSD scores of the children also went down. In line with these results, we recommend that PICU staff be given PTSD related training sessions to develop their awareness of this issue. This may help to ensure that they take steps to prevent PTSD, recognise at-risk groups and ensure that any symptoms of PTSD are detected early. In order to prevent or minimize PTSD, all healthcare professionals should implement and maintain an atraumatic, patient and family-centred, individualized, holistic care approach. Clinical psychologists should be assigned to children who are admitted to PICUs and to their families. PTSD screening should be routinely conducted for all children admitted to and discharged from a PICU, as well as for their families. Children and their parents with PTSD should be referred to professional support services.

Implications for Nursing Practice

Nurses continuously observe and care for the children treated in intensive care units. From the first moment a child is admitted to the unit, pediatric nurses should adopt a patient and family centred, atraumatic, holistic care approach to prevent the development of PTSD. The potential negative psychological effects of the situation should be reduced as much as possible. Screening for PTSD after the stay in the PICU is important for both children and their parents in order to detect any symptoms at an early stage and to provide the necessary professional support without delay.

Limitations of the Study

The limitation of the study is that it was conducted in a single hospital.

Authorship Contributions

Concept: A.K., A.A., Design: A.K., A.A., Data Collection and/or Processing: A.K., A.A., Analysis and/or Interpretation: A.K., A.A., Literature Search: A.K., A.A., Writing: A.K., A.A.

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