ROMATİZMAL KALP HASTALIĞI OLAN ÇOCUK ve ERGENLERDE PSİKİYATRİK PROBLEMLER ve BUNLARI ETKİLEYEN FAKTÖRLER: BİR ÖN ÇALIŞMA

Psychiatric Problems in Children and Adolescents with Rheumatic Heart Disease and Which Factors Affect Them: A Prelımınary Study

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ÖZ

GİRİŞ: Romatizmal kalp hastalığı olan çocuk ve ergenlerde psikiyatrik belirtilerin yanı sıra yaşam kalitesini ve hangi faktörlerin bu psikiyatrik sorunlara katkıda bulunduğunu belirlemeyi amaçladık**.**

GEREÇ ve YÖNTEM: Romatizmal kalp hastalığı olan toplam 25 çocuk ve ergen, ayrıca, 6-16 yaş arası 25 çocuk ve ergen kontrol grubu olarak dahil edildi. Okul Çağı Çocukları İçin Duygulanım Bozuklukları ve Şizofreni Görüşme Çizelgesi-Şimdi ve Yaşamboyu Şekli (ÇDŞG-ŞY) tüm çocuk ve ergenlerin ebeveynlerine uygulandı ve Çocuklarda Depresyon Envanteri, Spielberger Durumluluk ve Süreklilik Kaygı Envanteri ve KINDLR Anketi Çocuk ve Ergenlerde Sağlığa İlişkin Yaşam Kalitesinin Ölçülmesi için tüm çocuk ve ergenlere uygulanmıştır. Anneleri değerlendirmek için, Beck Depresyon Envanteri, Beck Anksiyete Envanteri ve Beş Faktör Kişilik Envanteri kullanılmıştır.

BULGULAR: Romatizmal kalp hastalığı olan çocuk ve ergenlerde anksiyete puanlarının ve anksiyete bozukluğu tanısının yüksek olduğunu bulduk (p <0.05). Annelerin kaygı puanları, depresyon puanları ve kişilik özellikleri KINDL alt ölçekleri ile ilişkili idi ve kişilik özelliklerinden nevrotiklik puanları da Çocuk Depresyon Ölçeği puanları ile ilişkili olarak bulundu. Ayrıca, psikiyatrik bozukluk varlığının, Beck anksiyete skorları ile tahmin edilebildiğini bulduk.

SONUÇ: Sonuçlarımız, psikiyatrik değerlendirmenin, romatizmal kalp hastalığı olan çocukların ve ergenlerin ve ebeveynlerinin tedavisinde önemli olduğunu göstermektedir.

Anahtar kelimeler: Romatizmal kalp hastalığı, çocuklar, anneleri

ABSTRACT

INTRODUCTION: We aimed to evaluate the psychiatric symptoms in addition to quality of life in children and adolescents with rheumatic heart disease, and to determine which factors contribute to psychiatric problems of them.

MATERIALS and METHODS: A total of 25 children and adolescents with rheumatic heart disease, additionally, 25 children and adolescents with typical developing controls aged 6–16 years old were included. Kiddie-Schedule for Affective Disorders and Schizophrenia, (present and life time version – K-SADS-PL) was applied to parents of all of the children and adolescents, and Child Depression Inventory, The Spielberger State-Trait Anxiety Inventory for children KINDL[R] Questionnaire for Measuring Health-Related Quality of Life in Children and Adolescents were applied to all of the children and adolescents. Assessment for mothers, Beck Depression Inventory, Beck Anxiety Inventory and Five Factor Personality Inventory were used.

RESULTS: We found higher anxiety scores and increased anxiety disorder diagnosis among children and adolescents with rheumatic heart disease (p<0.05). Mothers' anxiety scores, depression scores, and personality traits are associated with KINDL subscales, and neuroticism scores are also associated with Child Depression Inventory scores. In addition, presence of psychiatric disorder was predicted by Beck anxiety scores.

CONCLUSIONS: Our results suggest that psychiatric evalution is important in the treatment of children and adolescents and their parents with rheumatic heart disease.

Key words: Rheumatic heart, children, mothers

INTRODUCTION

Rheumatic fever is an important cause of heart diseases in children and adolescents in developing countries such as our country, Turkey and it is a public health problem. In the most recent studies the incidence of rheumatic fever in the Central Anatolia region of Turkey was found as 7.4 / 100.000 in children aged 10 -14 years (1). In the recent years, improvement of living conditions, early diagnosis of the disease, adequate treatment and prophylaxis with penicillin, and regular follow-up of patients were provided to decrease medical complications (2). Thus, other issues about patients' become more important such as psychiatric disorders (3), and therefore, health care providers who study in this area aim to increase life quality in terms of physical, emotional, social, and other dimensions and treatment of psychiatric problems (4).

When reviewing the literature on psychiatric problems in children with rheumatic heart disease, it was found that internalizing psychological stress scores were higher in children with heart diseases compared with normal children (5), but the literature on this subject is also limited. Heart diseases, could influence physical and social status and decrease quality of life. However few studies in the literature have assessed the quality of life in patients with rheumatic heart disease (6, 7).

Most of studies have found that the presence of chronic diseases in children affected the well-being of the entire family, which is at risk for major psychological and social disturbances (8, 9) As compared with parents of healthy children, it was shown that parents of children with heart disease generally showed a higher incidence and severity of anger, anxiety, depression, hopelessness, and/or somatization symptoms (8, 10). Studies have shown that the disease affects the mothers of the children with heart disease more than fathers and mothers reported greater anxiety, more somatic symptoms and a higher prevalence of clinically significant psychological distress (11, 12), because mothers tend to be more involved than fathers in care-giving, and are more likely to stay in hospital with the child (13).

Transactional stress and coping models highlight that stress is a multidimensional concept (interaction of personal, disease and environmental factors) and the stress response is mediated by parents who appraise the situation and their coping mechanisms (14). Personality is also an important factor in this model; we realized that although the other factors such as disease- related factors have been studied previously, personality related factors have not been studied.

To the best of our knowledge, as a developing country, there have been no studies in Turkey that evaluated the psychiatric status of children with rheumatic heart disease and no studies in the literatüre have investigated the personality traits of mothers'and how they affect their children.

We addressed this existing gap in knowledge and aimed to explore the psychiatric symptoms and quality of life in a sample of Turkish children with rheumatic heart disease and their mothers in comparison with healthy controls.

MATERIALS and METHODS

Subjects: A total of 25 children and adolescents with rheumatic heart disease, aged 6–16 years old were included. The treatment of all of the children and adolescents who were enrolled in this study was managed by the pediatric cardiology department of Kayseri Research and Training Hospital between 2016 and 2017. The diagnosis had been established by experinced pediatric cardiologist. Additionally, 25 children and adolescents who are typically developing and have similar age and cultural traits were recruited as the control group from other pediatric outpatient clinics. Gender was matched with patient group. Exclusion criteria for patient group were presence of additonal diseases other than rheumatic heart disease, and presence of clinically diagnosed mental retardation. Exclusion criteria for control group were presence any chronic disease and presence of clinical diagnosed mental retardation. Informed consent was obtained from parents and children and adolescents to participate.

Instruments for Assessment of Children and Adolescents

Kiddie-Schedule for Affective Disorders and Schizophrenia, (present and life time version – K-SADS-PL) was applied to parents by a specialist of child psychiatry. It screens diagnostic data on both psychiatric disorders and symptoms Psychiatric diagnosis is noted if it was determined as a result of the K-SADS-PL (15).

To determine depression scores, **Child Depression Inventory** was used. It was developed by Kovacs and includes 27 items. Each items scores as 0,1 or 2 and cut off score of inventory for depression is 19 (16).

The Spielberger State-Trait Anxiety Inventory for Children was used to measure anxiety of children and adolescents. The State-Trait anxiety inventory consists of two questionnaires of 20 items each. The first questionnaire measures state anxiety (how one feels at the moment), the second, trait anxiety (how one generally feels). Each item scores between 1 to 3 and the greater scores show the greater anxiety (17).

We used **KINDL^R** Questionnaire for measuring Health-Related Quality of Life in Children and Adolescents. Three versions of the KINDL^R questionnaire are available as self-report measures for different age groups: Kiddy-KINDL^R (4 to 7 years), Kid-KINDLR (8 to 12 years), Kiddo-KINDL^R for adolescents (13 to 16 years). The KINDL^R questionnaire consists of 24 Likert-scaled items associated with six dimensions: physical well-being, emotional well-being, self-esteem, family, friends and everyday functioning (school or nursery school/kindergarten). The sub-scales of these six dimensions can be combined to produce a total score. The greater scores show the better Quality of Life (18).

Instruments for Assessment to Mothers

Beck Depression Inventory was used for assesment of depression scores mothers. It is a 21-item self-report questionnaire in which each item on 4-point scale ranging from 0 (absent) to 3 (severe) and total scores range from 0 to 63 (19).

Beck Anxiety Inventory is 21-items self report measure that assesses level of anxiety and participants rate each item on 4-point scale ranging from 0 (absent) to 3 (severe) and total scores range from 0 to 63 and high scores indicate more severe anxiety symptoms (20).

Five Factor Personality Inventory short form was developed by Tatar and it is consists 85 items. It was used for assesment personality traits of mothers These traits are extroversion, agreeableness, conscientiousness, neuroticism, openness to experience and additionally social desirability (21).

The last scale for mother's was **KINDL parent form.** There are two parents' versions: Kiddy-KINDLR (4-7 years) and parents' version of the KINDLR for 8 to 16-year-old children and teenagers. It was a parent-proxy questionnaire administered to determine Health Related Quality of Life of youth (18).

Procedure: The interviews were performed during the usual visits of the patients to the department of pediatric cardiology. Firstly the patients and their parents were interviewed together and sociodemographic data was collected. Then, while children and adolescents were completing their scales, a child and adolescent psychiatry specialist applied to parents the K-SADS-PL. After the KSADS-PL, the mothers completed their scales.

Statistical analysis: Shapiro-Wilk test was used to analyze homogeneity of variables. Indepent sample t test was used to analyze group differences on demographic variables. Mann Whitney U test were used for non-homogenous variables. Chi-square or Fisher Exact analysis was used to analyze associations between categorical variables were examined using. For correlation analyses, Pearson or Spearman were used. Logistic Regression analyzes were used for determine factors that contribute for presence of psychiatric disorder of children and adolescents. Multiple Logistic Regression analyzes were used for determine the effect of mothers' scales on scales of children and adolescents. Data analysis was performed using SPSS 22.0 and p-values <0.05 were considered statistically significant.

RESULTS

1. Socidemographic data: The sociodemographic and clinical characteristics of the participants are shown in Table 1. The patients' age ranged between 6 and 16 years with a mean age of 12.88 (±2.66). There were significant differences in mothers' education levels, and fathers' profession between the groups. Psychopathology was detected 44% of patients and Adjustment Disorder is most common diagnose in our patient sample.

Table 1. Sociodemographic Characteristics of Both Groups**.**

Group	Patient Group Mean ±SD\Median (IR)	Control Group Mean ±SD\Median (IR)	Group Differences
Mean of age	12.88±2.66	13.04±2.70	p= 0.83
Gender (n [%]) Female Male	20 (80%) 5 (20%)	20 (80%) 5 (20%)	p= 1
Mean of Mother's age	37.5±4.59	40.16±4.70	p= 0.05
Mother's Educational Status (n [%]) No Primary School Secondary School High School University	1 (4) 18 (72) 4 (16) - 2 (8)	- 2 (8) 11 (44) 2 (8) 10 (40)	**p<0.001***
Mother's Profession (n [%]) House wife Public Servant Self-employed	24 (96) 1 (4) -	21 (84) 2 (8) 2 (8)	p= 0.28
Median of Father's age	42 (8)	43 (10.5)	p= 0.72
Father's Profession (n [%]) Worker Public Servant Self-employed No employment	18 (72) 2 (8) 3 (12) 2 (8)	7 (28) 6 (24) 12(48) -	**p= 0.002***
Family type (n [%]) Mother and Father together Divorced- living with a single parent	24 (96) 1 (4)	25 (100) -	p= 1
Duration of diagnosis (months) 6 – 12 months 12-36 months 36-48 months > 48 months	8 (32) 14 (56) 1 (4) 1 (4)		

2. The outcomes of Depression, Anxiety and Quality of life scores of children and adolescents

The outcomes of scales of children and adolescents can be found in Table 2. Patient group cases showed higher scores than controls on The State-Trait anxiety inventory -State, The State-Trait anxiety ınventory -Trait and The State-Trait anxiety inventory -Total (p<0.05).

Table 2. The outcomes of Depression, Anxiety and Quality of life scores of children and adolescents for the both groups

	Patient Group (n=25) **Mean ±SD\Median (IR)**	**Control Group (n=25)** **Mean ±SD\Median (IR)**	**Group Differences**
CDI	10.64 ± 6.12	10.44 ± 5.35	p = 0.9
State-Trait Anxiety Inventory-State	43.44 ± 7.68	34.36 ± 11.04	**p= 0.001***
State-Trait Anxiety Inventory-State	44.92 ± 7.39	37.84 ± 8.63	**p= 0.003***
State-Trait Anxiety Inventory- total	88.36 ± 12.82	72.2 ± 18.45	**p= 0.001***
KINDL-Physical Well-being	3.5 (1.13)	3.5 (1.13)	p= 0.95
KINDL- Emotional Well-being	4 (1.13)	3.75 (1.38)	p= 0.66
KINDL-Self-esteem	3.01 ± 1.08	2.89 ± 1.0	p= 0.68
KINDL- Family	4.25 (1.5)	4 (1.5)	p= 0.33
KINDL- Friends	4.25 (1.13)	3.75 (1.13)	p= 0.67
KINDL- School	3.0 ± 0.68	3.31 ± 0.89	p= 0.17
KINDL- sum score	21.14 ± 3.61	20.83 ± 3.5	p= 0.76

SD: Standart Deviation, IR: Interquartile Range , CDI: Child Depression Inventory

3. The outcomes of scales of mothers: Comparing Patient group with control group, It was found that higher Five Factor Personality Inventory -agreeableness, conscientiousness and openness to experience scores (p= 0.004, p= 0.015, p= 0.02 respectively)

Table 3. The outcomes of scales of mothers for the both groups

	Patient Group (n=25) Mean ±SD	Control Group (n=25) Mean ±SD	Group Differences
Beck Depression Inventory	13.08±9.21	10.8±4.37	p= 0.26
Beck Anxiety Inventory	18.08±12.67	14.64±7.51	p= 0.24
FFPI- extroversion	3.45 ± 0.57	3.15 ± 0.53	p= 0.06
FFPI- agreeableness	3.88 ± 0.54	3.35 ± 0.70	**p= 0.004***
FFPI- conscientiousness	3.64 ± 0.43	3.34 ± 0.39	**p= 0.015***
FFPI- neuroticism	3.39 ± 0.82	3.34± 0.52	p= 0.8
FFPI- openness to experience	3.76 ± 0.48	3.37 ± 0.68	**p= 0.02***
FFPI- social desirability.	3.32 ± 0.59	3.09± 0.72	p= 0.23

FFPI: Five Factor Personality Inventory

4. The outcomes of correlation analyses: In Table 4, Correlations of the Outcomes of Scales of Children and Adolescents, age of children and presence of psychiatric disorder, with Outcomes of Mothers' were summarized. It was found that especially Beck Anxiety scores was correlated with presence of psychiatric disorder and mothers' personality traits could be correlated with psychiatric problems of children and adolecents.

Table 4. Correlation of the Outcomes of Scales of Children and Adolescents with Outcomes of Mothers'

	Beck Anxiety Scores		Beck Depression Scores		FFPI extroversion		FFPI conscientiousness		FFPI neuroticism		FFPI openness to experience	
	r	p	r	p	r	p	r	p	r	p	r	p
Age	0.06	0.64	-0.08	0.58	-0.55	0.7	-0.08	0.56	0.09	0.5	-0.30	**0.03***
Presence of psychiatric disorder	0.37	**0.008***	0,18	0,21	0.07	0.6	0.04	0.78	0.03	0.79	0.07	0.6
CDI	0.11	0.41	0.26	0.062	-0.54	0.71	-0.67	0.64	0.28	**0.04***	-0.11	0.44
STAI-State	0.16	0.25	0,11	0.41	0,37	**0,008***	0.43	**0.002***	-0.21	0.99	0.21	0.14
STAI-Trait	0.35	**0.01***	0.11	0.41	0.27	0,056	0.26	0.059	0.04	0.74	0.13	0.34
STAI-total scores	0.27	0.055	0.12	0.37	0.35	**0,01***	0.38	**0.005***	0.01	0.93	0.19	0.18
KINDL												
KINDL-Physical Well-being	-0.29	**0.04***	-0.16	0,24	0.17	0.23	0.11	0.44	-0.006	0.96	0.26	0.059
KINDL-Emotional Well-being	-0.77	0.59	-0.21	0,13	0.06	0.66	0.14	0.3	-0.20	0.15	0.28	**0.04***
KINDL- Self Esteem	-0.19	0.16	-0.21	0,14	0.30	**0.03***	0.17	0.21	-0.18	0.20	0.38	**0.006***
KINDL- Family	-0.18	0.21	-0,26	0.06	0.13	0.36	0.13	0.36	-0.21	0.13	0.22	0.11
KINDL- Friends	-0.14	0.31	-0.13	0.34	0.25	0.07	0.22	0.11	-0.51	0.72	0.36	**0.01***
KINDL- School	-0.22	0.12	-0.14	0.32	-0.001	0.99	0.20	0.15	-0.17	0.23	0.007	0.96
KINDL- Sum score	-0,27	0.053	-0.28	**0.04***	0.23	0,09	0.24	0.08	-0.21	0.14	0.38	**0.006***

FFPI: Five Factor Personality Inventor, STAI: State- Trait Anxiety Inventory, CDI: Child Depression Inventory. Pearson and Spearman correlation tests were used. *p<0.05.

In Table 5, Correlations of the Outcomes of KINDL with other scales of children and adolescents were summarized. Especially there were strong correlations between Child Depression Inventory and The

State-Trait anxiety inventory with KINDL scales. Furthermore, age of children and adolescents was found negatively correlate with KINDL scales.

Table 5. Correlation of the Outcomes of KINDL with Other Scales of Children and Adolescents

	Age		CDI		STAI-State		STAI-Trait		STAI-total scores	
KINDL	**r**	**p**	**r**	**p**	**r**	**p**	**r**	**p**	**r**	**p**
KINDL- Physical Well-being	-0.47	**0.01***	-0.44	**0.004***	-0.39	**0.04***	-0.42	**0.03***	-0.55	**0.004***
KINDL- Emotional Well-being	-0.55	**0.004***	-0.48	**0.002***	-0.53	**0.006***	-0.82	**<0.001***	-0.82	**<0.001***
KINDL- Self Esteem	-0.62	**0.001***	-0.15	0.34	-0.33	0.1	-0.55	**0.004***	-0.51	**0.008***
KINDL- Family	-0.15	0.44	-0.19	0.22	-0.43	**0.03***	-0.34	0.09	-0.45	**0.02***
KINDL- Friends	-0.63	**0.001***	-0.40	**0.009***	-0.29	0.15	-0.75	**<0.001***	-0.6	**0.001***
KINDL- School	-0.08	0.69	-0.49	**0.001***	0.09	0.64	-0.20	**0.33**	-0.05	0.78
KINDL- Sum score	-0.6	**0.001***	-0.63	**<0.001***	-0.47	**0.01***	-0.77	**<0.001***	-0.73	**<0.001***

*CDI: Child Depression Inventory, STAI: State- Trait Anxiety Inventory, Pearson and Spearman correlation tests were used. *p<0.05.*

The duration of disease was showed no significant correlation with Child Depression Inventory, The State-Trait anxiety inventory and KINDL scores.

In Binary Logistic Regression analyzes, mothers' personality model (Five Factor Personality Inventory subscales) could be explain 10% (Nagelkerke R square) of the variance in the presence of psyhiatric disorder. It was found that presence of psychiatric disorder could not be predicted significanlty by mothers' Five Factor Personality Inventory traits.

In Lineer Regression analyzes, mothers' personality model (Five Factor Personality Inventory subscales) could be explain 15.7% (Adjusted R square) of the variance in the anxiety scores. Anxiety scores of children positively predicted significanlty by Five Factor Personality Inventory - conscientiousness (B=13.3, p=0.05).

Mothers' personality model (Five Factor Personality Inventory subscales) could be explain 3% (adjusted r square) of the variance in the Child Depression Inventory scores. It was found that Child Depression Inventory scores could be predicted positively by Five Factor Personality Inventory-neuroticism scores (B=3.89, p=0.01). Five Factor Personality Inventory subscales could be explain 10% (adjusted r square) of the variance in the KINDL total scores. It was found that KINDL total scores could be predicted positively by Five Factor Personality Inventory- openness to experience scores (B=2.43, p=0.05).

DISCUSSION

This is the first study to assess the psychiatric problems of children and adolescents with rheumatic heart disease in Turkey and identify factors that contribute to psychiatric problems. Our results demonstrated higher anxiety scores and increased anxiety disorder diagnoses among children and adolescents with rheumatic heart disease. Additionally, mothers' anxiety scores, depression scores and personality traits were associated with psychiatric problems of children and adolescents. The anxiety and depression scores of children and adolescents were affected by personality traits of mothers.

In the literature, it is stated that rheumatic fever is mainly related to poverty, overcrowding, low maternal literacy and employment status of parents (22). In our results, we found that there were significant differences between the groups in terms of the mothers' educational status and fathers' professions, we thought that the reason was that the majority of children were from urban areas.

Many studies indicate that rheumatic fever occured equally in both sexes (23, 24) . Regarding sex, four in five of the studied children were females. The study was highly supported by Al-munibari et al.(25), who mentioned that the disease was significantly more prevalent among girls aged 10 to 12 years.

Furthermore, we reported high levels of psychiatric disorders especially adjustment disorder and anxiety disorder in children with rheumatic heart disease. This result is consistent with several previous studies that reported high depression and anxiety scores among children with chronic diseases especially in children with cardiac diseases (5, 26). However, we found significant differences between the groups on all The State-Trait anxiety inventory scores, but there was no statistically significant difference in Child Depression Inventory scores.

This result might be attributed to the small sample or anxiety might be a more consistent psychological problem associated with rheumatic heart disease. Anxiety symptoms can have a negative impact on treatment outcomes in chronic illness, but in a study by Essawy et al.(27), the results showed that anxiety was positively correlated with response to their treatment.

We also found that treatment compliance of patients was good, and many authors stated that children's compliance in receiving their medications such as long-acting penicillin and aspirin would eliminate the infection and inflammation.

Although it was shown in several studies that cardiovascular diseases in children and adolescents affected health-related quality of life of patients and their parents negatively (6, 7), we found no statistically significantly difference between the groups in terms of KINDL scores. Essawy et al.(27) revealed that the majority of school- age children with rheumatic fever had a neutral quality of life. They claimed that treatment compliance might play role on neutral quality of life. Personal characteristics related with self-esteem are considered to facilitates positive perceptions of stressful life situations and reduced psychological distress (28). Failure to detect such quality of life scores in our study might be related to the lack of tools needed to detect these personality traits in children and adolescents.

Another factor that we thought might be affect coping with illness was ethnicity. Previous studies suggested that Arabic society tends to believe that illness and disability come from God (29), and this faith may promote acceptance and adjustment,which is similar to the religious context of our country. However, some authors have suggested that parents of a child with chronic illness might be more caring and providing and might demonstrate greater acceptance than parents of healthy children to compensate the child for their discomfort (30). We believe that parenting in our country is tends to be more protective and compromising especially to children and adolescents with any disease. Therefore, similar KINDL scores or scores higher than the control group might be related to this parenting style.

Severeal studies reported that parents of the children with heart disease might show higher stress levels than parents of children with other diseases, and may feel great stress (31). In our study, we found no significant differences between the groups in terms of the Beck Depression Inventory and Beck Anxiety Inventory. Failure to detect a such significant difference between the groups in our study might be related to the lack of tools needed to detect the other affecting factors such as the parents' marriage relationship or coping styles according to child's disease.

Additionally, we found that Five Factor Personality Inventory- agreeableness, Five Factor Personality Inventory – conscientiousness and Five Factor Personality Inventory- openness to experience personality traits were higher than control group, and we speculated that these positive personality traits might protect the mothers' themselves and their children with rheumatic heart disease from psychological problems and could provide for the lack of a significant difference between groups on Beck Depression Inventory and Beck Anxiety Inventory.

The age of the patient was significantly negatively correlated with KINDL-subscales. An age effect was shown on KINDL, indicating that younger children scored as having higher quality of life higher as compared with older children, which could be associated with higher stress levels at the beginning of puberty (32).

We showed that there was a positive correlation between age and trait and total anxiety scores. Lewis et al. reported that at ages 10-15 years, chronic illness was perceived as loss of independence and plans for the future. This may lead to an increase in the level of anxiety (33). This result may indicate that the child's age is an important factor for the consciousness of the illness. If children receive psychoeducation about their own illness and its complications, it could decrease anxiety symptoms.

As we expected, the presence of psychiatric disorder was negatively correlated with KINDL-subscales.

Also, we found that the Child Depression Inventory, STAI anxiety and KINDL scores were affected by personality traits of mothers. Neuroticism trait indicates the tendency to experience negative emotions (e.g., anger, anxiety, or depression) and a limited tolerance for disturbing status (34). It was shown in several studies that neuroticism was related to depressive symptoms and depression within both adults and adolescents (35). With all of these results, it was speculated that a mother's neuroticism traits could affect their children's depressive symptoms.

In conclusion, rheumatic heart disease had an impact on the most psychiatric status and the quality of life of the children. Our results demonstrate the need for further studies concerning psychiatric and family conditions in children with rheumatic heart disease. Most significantly, our study emphasizes that psychiatric evaluations must not be disregarded in the treatment and follow-up of children and adolescents with rheumatic heart disease and their parents. Mothers' personality trait should be assessed carefully because its effects on their children. During follow-up of these patients, scales could be used for the assessment of children and their mothers' and they could be referred to psychiatry departments. It is our hope that our study might start this kind of support program in Turkey for children with rheumatic heart disease and mothers or for other chronic disorders in a more comprehensive healthcare system.

There are several limitiations in our study. First, the small size of the sample might limit the generalization of the results on Turkish children or in children with rheumatic heart disease in general and it remains as a preliminary study. This small number did not allow for the determination of differences in quality of life. Second, our data depended entirely on the patients' subjective assessment of their own quality of life. Furthermore, other confounding factors, such as parenting styles, marriage relationship, and child's temperament were not taken into account.

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Conflict of Interest: None

Ethical Standarts : The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national guidelines on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008, and has been approved by the institutional committees. The study was approved ethically by the Institutional Ethics Committee of Erciyes University with the 2016/502 number.

P.s: Findings of this study was published as a poster presentation in 12th Annual Congress of the European Association for Haemophilia and Allied Disorders 2019, Prague, Czech Republic

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