Psychiatric Evaluation of Children with Vernal Keratoconjunctivitis

Vernal Keratokonjonktivitli Çocuklarda Psikiyatrik Değerlendirme

Melis PALAMAR,[a]
Burcu ÖZBARAN,[b]
Serpil ERERMİŞ,[b]
Ayşe YAĞCI[a]

Departments of
[a]Ophthalmology,
[b]Child and Adolescent Psychiatry,
Ege University Faculty of Medicine,
İzmir,

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Yazışma Adresi/*Correspondence:*
Melis PALAMAR
Ege University Faculty of Medicine,
Department of Ophthalmology, İzmir,
TÜRKİYE/TURKEY
melispalamar@hotmail.com

ABSTRACT Objective: To evaluate the psychiatric effects of vernal keratoconjunctivitis (VKC) in children. **Material and Methods:** Psychiatric evaluation forms were filled out through an interview with 25 children with vernal keratoconjunctivitis (VKC, study group) and 36 myopic (-0.50 and -1.50 D) and otherwise healthy children (control group). Both groups' mothers filled the Child Behavior Check List (CBCL). All children filled the Children Depression Inventory (CDI), the State-Trait Anxiety Inventory (STAI), and were interviewed using Kiddie Schedule for Affective Disorders and Schizophrenia. The Diagnostic and Statistical Manual for Psychiatric Disorders, 4th edition was used for psychiatric diagnosis. **Results:** The CBCL scores of activities ($p<0.0001$), and sociability ($p=0.003$) were significantly lower, and the scores of withdrawn ($p=0.48$), somatization ($p<0.0001$), anxiety depression ($p=0.045$), attention problems ($p=0.001$), total problems ($p=0.020$), internalizing ($p=0.001$) were significantly higher in the study group. The scores of STA-I I ($p<0.0001$) and STAI II ($p<0.0001$) were significantly higher in the study group. The CDI scores of the study group were significantly higher ($p<0.0001$). A psychiatric diagnosis was made in 64.00% of the study group, and in 2.77% of the control group patients ($p< 0.0001$). **Conclusion:** VKC is a chronic disorder which affects the activity and sociability of children, and tends to cause depression and anxiety disorders. Ophthalmologists should be aware of the possible psychiatric effects of VKC in pediatric population, and should remember to consult these children to child psychiatrists.

Key Words: Anxiety; child; depression; myopia; psychiatric status rating scales; conjunctivitis, allergic

ÖZET Amaç: Vernal keratokonjonktivitin çocuklardaki psikiatrik etkilerinin değerlendirilmesi. **Gereç ve Yöntemler:** Yirmi beş vernak keratokonjuktivitli (VKK, çalışma grubu) ve 36 miyopik olup diğer yönlerden sağlıklı (kontrol grup) çocuklarla görüşme sonrası psikiyatrik değerlendirme formları doldurulmuştur. Her iki grup çocukların anneleri, çocukları için davranış değerlendirme ölçeğini (ÇDDÖ) doldurmuşlardır. Tüm çocuklar için depresyon envanterini (ÇDE), durumluluk - süreklilik anksiyete envanterini (DSKE) doldurmuşlar ve görüşmeleri çocuklar için affektif bozukluklar ve şizofreni görüşme çizelgesi kullanılarak yapılmıştır. **Bulgular:** CDDÖ alt ölçeklerinden aktivite ($p<,.0001$) ve sosyallik ($p=0,003$) anlamlı olarak düşüktür ve içe çekilme ($p=0,48$), somatizasyon ($p<0,0001$), anksiyete/depresyon ($p=0,045$), dikkat sorunları ($p=0,001$), toplam sorunlar ($p=0,020$) ve içe atım sorunları ($p=0,001$) çalışma grubunda anlamlı olarak daha yüksektir. DSKE-I ($p<0,0001$) ve DSKE-II ($p<0,0001$) puanları çalışma grubunda anlamlı olarak daha yüksektir. ÇDE puanları çalışma grubunda anlamlı olarak daha yüksektir ($p<0,0001$). Çalışma grubunun %64,00'ü psikiyatrik bir tanı almış olup, kontrol grubunda bu oran sadece %2,77 olarak bulunmuştur ($p<0,0001$). **Sonuç:** VKK, çocukların aktivite ve sosyalliğini etkileyen, depresyon ve anksiyete bozukluklarına neden olabilen kronik bir hastalıktır. Oftalmologlar VKK'nin çocuk popülasyonundaki olası psikiyatrik etkilerinden haberdar olmalı ve bu çocukları çocuk psikiyatristleriyle konsülte etmeyi ihmal etmemelidirler.

Anahtar Kelimeler: Anksiyete; çocuk; depresyon; miyopi; psikiyatrik durumu değerlendirme ölçekleri; konjonktivit, allerjik

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Vernal keratoconjunctivitis (VKC) is a seasonally recurrent, bilateral allergic disease which is characterized by severe chronic inflammation of the ocular surface.[1,2] The onset of VKC is generally before the age of 10, and the disease lasts 2 to10 years. It usually resolves during late puberty, and boys are affected twice as often the girls. The most prominent symptom is itching, which can become worse towards evening and is exacerbated by rubbing.

Both genetic and environmental factors are implicated in the incidence of this chronic disease.[3] In spite of common clinical and immunological features with seasonal allergic conjunctivitis, perennial allergic conjunctivitis and atopic keratoconjunctivitis, VKC differs from all of these ocular allergic diseases. The age of onset, clinical findings, low percentage of patients with positive response to standard allergic diagnostic tests, and scarce response to antiallergic therapy discriminate VKC from the others.[1,4] This not an easy to control disease, and needs almost continuous medication and regular follow-up, as a must.

It was reported earlier that rates of depression, anxiety, and sleep disturbance which are risk factors for suicide, have increased in patients with allergic rhinitis when compared to normal individuals.[5] The rate of allergy is also reported to be greater in patients with depression.[5] It is also revealed that a high proportion of children with attention deficit hyperactivity disorder (ADHD) reported two or more symptoms of allergic rhinitis. These findings suggest that nasal obstruction, sleeping problems and other allergic symptoms can cause symptoms reminiscent of ADHD, or worsen the ADHD symptoms. Whether there is a causal link between ADHD and depression on one hand, and allergic rhinitis on the other is not known.[6] There are also reports about the probable negative effects of allergic diseases such as asthma on family system.[7]

Since VKC is also a chronic allergic condition, it most likely effects the social, academic and emotional life of the affected children. VKC patients experience tearing, redness, ocular itching, swelling and photophobia that are exacerbated with outdoor activities. These unfavorable interactions interfere the sociability by causing an "obligatory indoor" and "dim life". To the best of our knowledge, there are no reports on the psychiatric evaluation of VKC in children. In the present study, we aimed to evaluate the psychiatric symptoms and behavioral characteristics of children with VKC.

MATERIAL AND METHODS

METHODS

This study was performed among children with moderate intermittent (Grade 2A) to moderate severe (Grade 2B) VKC, who had been followed in our ophthalmology department for at least one year (between October 2008 and October 2010). Diagnosis and severity of VKC (either moderate intermittent/grade 2A or moderate persistant/grade 2B) were defined according to the clinical grading described by Bonini et al.[8] According to this grading, Grade 2 (moderate), is divided into two more grades based on the severity of symptoms and corneal involvement:

- Grade 2A (moderate intermittent): Occasional symptoms occur and may be disturbing during the day. Mild conjunctival secretion and tearing may interfere with daily activity. Mild to severe papillary reaction may be observed as well as conjunctival hyperemia, without corneal involvement.

- Grade 2B (moderate persistent): The patient is symptomatic every day during season. Conjunctival hyperemia, secretion and itching takes place everyday. The cornea may be occasionally involved with superficial punctuate keratitis. Mild to severe papillary reaction may be observed.

The control group consisted of otherwise healthy children with mild myopia (-0.50 and -1.50 D) who were being followed up every 6 months in our clinic. Children with any other chronic diseases, and history of any disease that might negatively affect the mental state were excluded from the study. No patients with any personal or family history of atopic diseases, such as asthma, rhinitis, and eczema, were included in these two groups.

However, the presence of ophthalmology visits for VKC was not taken into consideration.

PSYCHIATRIC EVALUATION

A personal evaluation form designed to assess the socio-demographic features of the child was filled out through an interview with the mother and the child.[9,10]

All children were interviewed using Kiddie Schedule for Affective Disorders and Schizophrenia (K-SADS). The Diagnostic and Statistical Manual for Psychiatric Disorders, 4th edition (DSM-IV) was used for psychiatric diagnosis.[11-13] All mothers of both groups filled the Child Behavior Check List (CBCL) for their children.[14-16]

All children filled the Children Depression Inventory (CDI) for evaluating their depressive symptoms.[17,18] For the anxiety symptoms, all children filled the State-Trait Anxiety Inventory for Children (STAI-C).[19-23]

Detailed psychiatric evaluation with K-SADS and structured inventories were made in the first session. Children and adolescents who received psychiatric diagnoses were followed up as outpatients in the child psychiatry clinic consultation and liaison department. Intelligence test was performed in case of any suspect of mental incapacity. All patients with VKC were interviewed during winter season which goes with less ocular symptoms. If necessary, psychotherapeutic and psychopharmacologic treatments were ordered.

MATERIALS

Kiddie Schedule for Affective Disorders and Schizophrenia (K-SADS): K-SADS is a semistructural interview form for determining the psychopathology of children and adolescents according to the DSM-IV criteria, and was established by Kaufman et al.[11,12] The Turkish adaptation study was made by Gokler et al. in 2004.[13] This interview which investigates the psychiatric symptoms of the patient (child or adolescent), is made individually with the patient and the parents. According to the symptom profile of the child, the interview takes approximately one hour or more.

American Psychiatric Association, Diagnostic and Statistical Manual of Mental Disorders, 4th ed. (DSM-IV), Text Revision: DSM-IV is the current reference used by mental health professionals and physicians to diagnose mental disorders.[12]

Children Depression Inventory (CDI): CDI is a self-report questionnaire including 27 items, and evaluates the depressive symptoms of children. Scores range from 0-52. Depression cutpoint is 19, and points over 14 can be used for evaluating the children who can be at risk for developing depression. Turkish validation was made by Oy.[18]

State Trait Anxiety Inventory for Children (STAI-C): STAI was developed in 1970 by Spielberger et al.[20] This scale is the one that is self-determined by the individual. It consists of 2 sub-scales each consisting of 20 items. Subgroup 1: State-trait anxiety inventory; defines how an individual feels at a certain moment and in certain conditions. Subgroup 2: Continuous anxiety inventory; defines how an individual feels generally regardless of the state and conditions of the moment. Scores from both scales range from 20 to 80. Higher scores indicate higher levels of anxiety. The cut-off point for validity-safety in Turkey has been determined as 36.[22] Points equal to or above 60 indicate a high level of anxiety. STAI-C was developed also by Spielberger et al in 1973, and Özusta made the Turkish validation.[19-23]

Child Behavior Check List (CBCL): The Turkish version of CBCL is a self-administered parents-report questionnaire that contains 20 competence items and 118 problem items.[14-16] The competence scales of the CBCL are activity, social and school. The problems scored with the checklist are aggressive behavior, anxious/depressed, attention problems, delinquent behavior, social problems, somatic complaints, thought problems, and withdrawn/depressed. The 118 problem items describe a wide array of problems that are rated on a 3-point scale. Parents score each item as 0, 1, or 2 (not true, somewhat true, or very true). There are also two open-ended items: one for adding other physical problems without known medical cause, and one for adding other problems. Scores from all of these

problem scales constitute the Total Problem Score, and also Internalizing and Externalizing problems. Scores range from 0 to100. A higher score represents a higher severity. There is no cut-off for CBCL scores. We compared the mean CBCL results of the study patients with the psychiatrically healthy control group. The test–retest reliability of the Turkish form was 0.84 for Total Problems, and the internal consistency was adequate (Cronbach alpha= 0.88).[14-16]

Wechsler Intelligence Scale for Children-Revised (WISC-R): WISC-R is a standardized intelligence test for children and includes two parts, as verbal and performance subtests.[24,25]

The study and data accumulation were carried out with approval from the appropriate Institutional Review Board. All parents and children were informed about the study and the study procedure. Informed consent was obtained from the mothers of the patients.

STATISTICAL ANALYSIS

All data were analyzed statistically with "SPSS 16.0" program. The value of "p" under 0.05 was accepted as significant. Non-parametric statistical evaluation was done with Yates's continuity correction test. The CBCL scores of study and control groups were analyzed with the Mann-Whitney test which measures the difference among the independent groups. The patients' age, gender, educational background, mental capacity, and psychiatric diagnoses were analyzed with frequency-analysis.

RESULTS

The study and the control groups consisted of 25 children (21 males, 4 females) and 36 children (22 males, 14 females), respectively. The gender distribution of the study and the control groups was not statistically different (p=0.100). The median age of the study and the control groups were 11 (range, 6 and 16) and 12 (range, 7 and 15) years, respectively. The difference between the mean ages of the groups was not statistically significant (p=0.768). When VKC cases were grouped according to the severity of VKC, 64% had moderate intermittent (Grade 2A) and 36% had moderate persistent (Grade 2B) VKC. All patients in both study groups had papillary reaction.

Overall, 64% of the study group patients (16 patients) and 2.77% of the control group patients (1 patient) received a psychiatric diagnosis (Table 1). The difference between the two groups was significant (p<0.0001). The diagnoses were anxiety disorder (8 patients), depressive disorder (3 patients), attention deficit and hyperactivity disorder (ADHD) (3 patients), and mild mental retardation (2 patients) in the study group. Two patients in the control group were diagnosed with depression and ADHD.[11,24,25] The mean age of the patients who received psychiatric diagnoses in the study and the control groups were 11.25 ± 2.57 (range, 8-15) and 8.00±1.4 (range, 7-9) years, respectively.

CBCL scores of the study and the control groups are shown in Table 2. The scores of activities (p<0.0001), and sociability (p=0.003) were significantly lower, and the scores of withdrawn (p=0.048), somatization (p < 0.0001), anxiety-depression (p=0.045), attention problems (p=0.001), total problems (p=0.020), internalizing (p=0.001) were significantly higher in the study group. Although the social problems (p=0.90) and externalizing (p=0.321) scores of the study group were higher than the control group, the comparisons did not yield statistically significant results (Table 2).

The scores of both STAI (p<0.0001) and STAI II (p<0.0001) were statistically higher in the study group compared to the control group (Table 3). The CDI scores of the study group were significantly higher (p<0.0001).

When CBCL scores were compared according to the severity, the only significant score was anxiety-depression. Anxiety-depression score was sig-

TABLE 1: The distribution and the frequency of the diagnoses among the groups.

Diagnosis	Study n (%)	Control n (%)
Anxiety disorders	8 (32.00)	1 (2.77)
Depressive disorders	3 (12.00)	-
ADHD	3 (12.00)	1 (2.77)
Mental retardation	2 (8.00)	-

ADHD: Attention deficit hyperactivity disorder.

TABLE 2: CBCL scores of the study and the control groups.

Scores	Study group (n=25) (mean±SD; min.-max.)	Control group (n=36) (mean±SD; min.-max.)	p value
Activities	32.80±8.04 (24-42)	43.51±5.66 (33-46)	p<0.0001
Sociability	36.40±8.75 (22-46)	44.00±7.46 (27-55)	0.003
Withdrawn	55.96±6.48 (50-70)	52.40±2.96 (50-58)	0.048
Somatization	64.08±6.05 (53-79)	51.80±3.46 (50-61)	p<0.0001
Anxiety-depression	58.28±7.75 (50-76)	54.62±5.95 (50-72)	0.045
Social problems	56.24±7.77 50-76)	52.62±4.75 (50-70)	0.90
Thought problems	55.68±8.01 (50-76)	55.74±5.96 (50-70)	0.521
Attention problems	59.48±7.71 (50-75)	53.94±5.76 (50-69)	0.001
Delinquent behavior	52.96±4.90 (50-67)	52.14±4.77 (50-67)	0.781
Agressive behavior	52.68±4.58 (50-68)	52.54±3.40 (50-67)	0.675
Total problems	52.60±11.19 (28-72)	46.51±10.70 (29-66)	0.020
Internalizing	57.76±10.68 (39-75)	48.22±10.38 (33-69)	0.001
Externalizing	47.12±9.72 (32-68)	44.25±8.65 (35-60)	0.321

CBLC: Child behavior Check List, Min: Minimum, Max: Maximum.

TABLE 3: STAI, STAI II and CDI scores among the groups.

	Study group (n=25) (mean±SD; min.-max.)	Control group (n=36) (mean±SD; min. -max.)	p value
STAI scores	36.92±7.35 (24-48)	25.00±4.02 (20-35)	p<0.0001
STAI II scores	35.36±6.73 (23-48)	25.17±4.57 (20-34)	p<0.0001
CDI scores	11.36±5.58 (5-22)	3.02±1.90 (1-7)	p<0.0001

STAI: State-Trait Anxiety Inventory; CDI: Children Depression Inventory.

nificantly higher in the moderate persistant (Grade 2B) VKC group (p=0.048).

DISCUSSION

Allergic diseases have been reported to affect 10% to 30% of adults and approximately 40% of children, and are increasing in prevalence for unknown reasons.[19] Symptoms of allergy are usually debilitating and very bothersome. The psychologic and psychiatric effects of asthma, rhinitis and urticaria were previously reported.[5,26-29] To the best of our knowledge, this is the first study that evaluates the behavioral and psychiatric effects of VKC in children.

In the present study, the total problem scores and internalizing scores on CBCL, and depression and anxiety scores on CDI and STAI of the VKC group were found to be higher than the control group, as reported in similar studies dealing with the psychiatric effects of other allergic conditions.[5,26-28] Depression-anxiety subscale scores were also higher on CBCL in the study group. As depression is a psychiatric disorder and arises based on some biological, psychological and social etiological factors, these results might be related to numerous refractory, annoying non-visual symptoms of VKC which restrict daily life.[29-33] Children with VKC have to cope with all of these somatic symptoms, go to frequent ophthalmic controls, use medications and avoid themselves from light, sun, etc.

One may concern that VKC-positive children could be or could have been on topical corticosteroids which might effect their mood. However, it was reported that in contrast to systemic corticosteroids, topical corticosteroids have no association with depression.[5] Having a chronic illness, using regular medications, restrictions of VKC symptoms in social life can cause the depression and anxiety symptoms, and might lead children to be vulnerable to anxiety and depressive disorders.

The withdrawn subscale scores were higher, and sociability and activity subscale scores were lower in the VKC group. Moreover, the severity of VKC caused higher depressive and anxiety symptoms in CBCL subscales. Stauder and Kovacs reported that adults with allergic diseases had higher

anxiety levels of STAI, similar to our study.[34] They also found that general anxiety disorders, panic attacks and social phobia were more frequent in allergic diseases. Similar to adults, pediatric patients in our study had higher anxiety disorders. Probably allergic disorders which have exacerbation and remission periods, lead to more anxiety.[35]

As mentioned by Thompson et al., allergic rhinitis does not have an impact only on psychological status but also on mood and cognition.[36] It has been demonstrated that children with allergic rhinitis have learning deficits, distraction, fatigue and irritability, all of which can deteriorate school performance.[36-38] In the present study, VKC-positive children were found to have higher attention problems, and 3 VKC patients received ADHD diagnosis. However, the most striking result is the higher attention problems in VKC patients as compared to controls, which is parallel to Thompson et al.'s findings. As mentioned earlier by Borres, whether or not there is a causal link between ADHD and allergic diseases is not known, but it is important to know that these two conditions may worsen the symptoms of both conditions and the clinicians have to pay attention on this comorbidity.[6]

Borres also emphasized that allergic diseases have a negative effect on attention and memory.[6] Learning problems and low school performance may also be secondary results of attention and memory deficits. The patients who suffer from asthma have more absenteeism from school compared to those who suffer from other allergic diseases, like allergic rhinitis. However, the fact is that, patients with allergic rhinitis experience a greater reduced work capacity (less school performance, less sportive activity, etc) than normal population.[6] There are no reports on school performance of children and adolescents with VKC, but the lower scores of VKC positive children on activity and sociability subtest of CBCL may suggest the relation on this issue.

The coexistence of VKC in mentally retarded patients with keratoconus has been reported before by Garcia Garcia and Martínez.[39] In our series, we detected 2 (8%) mild mental retardation cases, but they had no keratoconic changes. The prevalence of mental disorders is reported to be 1-3% in several epidemiological studies.[40-43] The higher rate of mental retardation among our study group patients might be incidental.

In several studies, allergic conjunctivitis and allergic rhinoconjunctivitis were reported to negatively effect the quality of life of patients.[44-46] The quality of life is reported to get worse if eye symptoms are added to the clinical picture in allergic rhinoconjunctivitis, which supports the importance of eye involvement in allergic diseases.[34,47] As well as physical symptoms, psychiatric disorders, such as depression, is also reported to have negative effect on quality of life.[29] We might assume that low activity and sociability levels, high anxiety and depression, high attention and internalizing problems in CBCL scores in VKC patients might reflect the negative life conditions of these children. However, structured quality of life studies should also be planned with these group of children.[34]

There are numerous studies on the effect of refractive errors on quality of life and behavior.[48-50] It was reported that high myopic patients had poorer vision-related quality of life when compared to mild and moderate myopic patients.[50] However, another study found no difference between mild, moderate and high myopia patients.[50] These conflicting results were explained with the varying prevalence of accompanying high-myopia-related complications.[50]

This is a cross-sectional study, so we cannot estimate the future psychiatric course of these VKC children with psychiatric diagnosis. Further clinical observational studies are needed to find out the oncoming psychiatric conditions of these children in puberty, when VKC is resolved.

As a result, not only ophthalmologists but also allergists, immunologists, and pediatricians should be aware of the psychiatric effects of VKC, especially in moderate and severe forms, and should not underestimate the mental consequences of this chronic disease. For the sake of healthy young generation, this issue should be extended with structured quality of life evaluation, school performance investigation, and relating family interaction review in collaboration with child psychiatrists.

REFERENCES

1. Bonini S, Bonini S, Lambiase A, Marchi S, Pasqualetti P, Zuccaro O, et al. Vernal keratoconjunctivitis revisited: a case series of 195 patients with long-term followup. Ophthalmology 2000;107(6):1157-63.
2. Leonardi A, Busca F, Motterle L, Cavarzeran F, Fregona IA, Plebani M, et al. Case series of 406 vernal keratoconjunctivitis patients: a demographic and epidemiological study. Acta Ophthalmol Scand 2006;84(3):406-10.
3. Montan PG, Ekström K, Hedlin G, van Hage-Hamsten M, Hjern A, Herrmann B. Vernal keratoconjunctivitis in a Stockholm ophthalmic centre--epidemiological, functional, and immunologic investigations. Acta Ophthalmol Scand 1999;77(5):559-63.
4. Leonardi A, Motterle L, Bortolotti M. Allergy and the eye. Clin Exp Immunol 2008; 153 (Suppl 1):17-21.
5. Postolache TT, Komarow H, Tonelli LH. Allergy: a risk factor for suicide? Curr Treat Options Neurol 2008;10(5):363-76.
6. Borres MP. Allergic rhinitis: more than just a stuffy nose. Acta Paediatr 2009;98(7):1088-92.
7. Ozkaya E, Cetin M, Uğurad Z, Samanci N. Evaluation of family functioning and anxiety-depression parameters in mothers of children with asthma. Allergol Immunopathol (Madr) 2010;38(1):25-30.
8. Bonini S, Sacchetti M, Mantelli F, Lambiase A. Clinical grading of vernal keratoconjunctivitis. Curr Opin Allergy Clin Immunol 2007; 7(5):436-41.
9. Ansseau M, Fischler B, Dierick M, Albert A, Leyman S, Mignon A. Socioeconomic correlates of generalized anxiety disorder and major depression in primary care: the GADIS II study (Generalized Anxiety and Depression Impact Survey II). Depress Anxiety 2008; 25(6):506-13.
10. Bloomberg GR, Banister C, Sterkel R, Epstein J, Bruns J, Swerczek L, et al. Socioeconomic, family, and pediatric practice factors that affect level of asthma control. Pediatrics 2009;123(3):829-35.
11. Kaufman J, Birmaher B, Brent D, Rao U, Flynn C, Moreci P, et al. Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version (K-SADS-PL): initial reliability and validity data. J Am Acad Child Adolesc Psychiatry 1997;36(7): 980-8.
12. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 4th ed (DSM-IV). Washington, DC: American Psychiatric Association; 1994. p.103-10.
13. Gokler B, Unal F, Pehlivanturk F, Kultur EC, Akdemir D, Taner Y. [Reliability and validity of schedule for affective disorders and Schizophrenia for school age children-present and lifetime version-Turkish version (K-SADS-PL-T)]. Turk J Child Adolesc Mental Health 2004; 11(1):109-16.
14. Achenbach TM, McConaughy SH, Howell CT. Child/adolescent behavioral and emotional problems: implications of cross-informant correlations for situational specificity. Psychol Bull 1987;101(2):213-32.
15. Erol N, Arslan BL, Akçakın M. The adaptation and standardization of the Child Behavior Checklist among 6-18-year-old Turkish children. In: Sergeant J, ed. Eunethydis: European Approaches to Hyperkinetic Disorder. 2nd ed. Zurich: Fotoratar; 1995. p. 97-113.
16. Erol N, Simsek Z. Mental health of Turkish children: behavioral and emotional problems reported by parents, teachers, and adolescents. In: Singh NN, Leung JP, Singh AN, eds. International Perspectives on Child and Adolescent Mental Health. 1st ed. London: Elsevier; 2000. p.223-47.
17. Kovacs M. The Children's Depression, Inventory (CDI). Psychopharmacol Bull 1985;21(4): 995-8.
18. Oy B. [Validity and reliability study of child depression inventory]. Turkish J Psychiatry 1991;2(3):132-6.
19. Spielberger CD, Barratt ES. Anxiety as an emotional state. Anxiety: Current Trends in Theory and Research. 1st ed. New York: Academic Press; 1972. p.3-22.
20. Spielberger CD, Ritterband LM, Sydeman SJ, Reheiser EC, Unger KK. Assessment of emotional state and personality traits: Measuring psychological vital signs. In: Butcher JN, ed. Clinical Personality Assessment: Practical Approaches. 1st ed. New York: Oxford University; 1995. p.42-58.
21. Papay JP, Spielberger CD. Assessment of anxiety and achievement in kindergarten and first- and second-grade children. J Abnorm Child Psychol 1986;14(2):279-86.
22. Özusta ŞH. [Validity and reliability study of the State Trait Anxiety Inventory for Children]. Türk Psikoloji Dergisi 1995; 10(1):32-44.
23. Ozbaran B, Kose S, Yagdi T, Engin C, Erermis S, Uysal T, et al. Psychiatric evaluation of children and adolescents with left ventricular assist devices. Psychosom Med 2012;74(5): 554-8.
24. Wechsler D. Intelligence defined and undefined: A relativistic appraisal. American Psychologist 1975;30(3):135-9.
25. Erdogan-Bakar E, Soysal S, Kiris N, Sahin A, Karakas S. [Place of Wechsler intelligence scale for children-revised in assessment of attention deficit hyperactivity disorder]. Clinical Psychiatry 2005;8(1):5-17.
26. Annesi-Maesano I. Epidemiological evidence of the occurrence of rhinitis and sinusitis in asthmatics. Allergy 1999;54(Suppl 57):7-13.
27. Dykewicz MS, Fineman S, Skoner DP, Nicklas R, Lee R, Blessing-Moore J, et al. Diagnosis and management of rhinitis: complete guidelines of the Joint Task Force on Practice Parameters in Allergy, Asthma and Immunology. American Academy of Allergy, Asthma, and Immunology. Ann Allergy Asthma Immunol 1998;81(5 Pt 2):478-518.
28. Worldwide variation in prevalence of symptoms of asthma, allergic rhinoconjunctivitis, and atopic eczema: ISAAC. The International Study of Asthma and Allergies in Childhood (ISAAC) Steering Committee. Lancet 1998; 351(9111):1225-32.
29. Engin B, Uguz F, Yilmaz E, Ozdemir M, Mevlitoglu I. The levels of depression, anxiety and quality of life in patients with chronic idiopathic urticaria. J Eur Acad Dermatol Venereol 2008; 22(1):36-40.
30. Halvorsen JA, Dalgard F, Thoresen M, Thoresen M, Bjertness E, Lien L. Itch and mental distress: a cross-sectional study among late adolescents. Acta Derm Venereol 2009;89(1): 39-44.
31. Baiardini I, Giardini A, Pasquali M, Dignetti P, Guerra L, Specchia C, et al. Quality of life and patients' satisfaction in chronic urticaria and respiratory allergy. Allergy 2003;58(7):621-3.
32. Özbaran B, Tamar M, Yüncü Z, Bildik T, Demiral N, Erermiş S. [Evaluation of parental attitudes in a clinical sample of adolescents with major depressive disorder]. Anatolian Journal of Psychiatry 2009;10(3):109-15.
33. Tosun A, Gokcen S, Ozbaran B, Serdaroglu G, Polat M, Tekgul H, et al. The effect of depression on academic achievement in children with epilepsy. Epilepsy Behav 2008;13(3):494-8.
34. Stauder A, Kovács M. Anxiety symptoms in allergic patients: identification and risk factors. Psychosom Med 2003;65(5):816-23.
35. Blaiss MS. Allergic rhinoconjunctivitis: burden of disease. Allergy Asthma Proc 2007;28(4): 393-7.
36. Thompson AK, Juniper E, Meltzer EO. Quality of life in patients with allergic rhinitis. Ann Allergy Asthma Immunol 2000;85(5):338-47;quiz 347-8.
37. Meltzer EO. Quality of life in adults and children with allergic rhinitis. J Allergy Clin Immunol 2001;108(1 Suppl):S45-53.

38. Sundberg R, Torén K, Höglund D, Aberg N, Brisman J. Nasal symptoms are associated with school performance in adolescents. J Adolesc Health 2007;40(6):581-3.

39. García García GP, Martínez JB. Outcomes of penetrating keratoplasty in mentally retarded patients with keratoconus. Cornea 2008;27(9): 980-7.

40. King BH, State MW, Shah B, Davanzo P, Dykens E. Mental retardation: a review of the past 10 years. Part I. J Am Acad Child Adolesc Psychiatry 1997;36(12):1656-63.

41. Einfeld SL, Tonge BJ. Population prevalence of psychopathology in children and adolescents with intellectual disability: II. Epidemiological findings. J Intellect Disabil Res 1996; 40(Pt 2):99-109.

42. McLaren J, Bryson SE. Review of recent epidemiological studies of mental retardation: prevalence, associated disorders, and etiology. Am J Ment Retard 1987;92(3):243-54.

43. Skovgaard AM. Mental health problems and psychopathology in infancy and early childhood. An epidemiological study. Dan Med Bull 2010;57(10):B4193.

44. Smith AF, Pitt AD, Rodruiguez AE, Alio JL, Marti N, Teus M, et al. The economic and quality of life impact of seasonal allergic conjunctivitis in a Spanish setting. Ophthalmic Epidemiol 2005;12(4):233-42.

45. Sacchetti M, Baiardini I, Lambiase A, Aronni S, Fassio O, Gramiccioni C, et al. Development and testing of the quality of life in children with vernal keratoconjunctivitis questionnaire. Am J Ophthalmol 2007;144(4): 557-63.

46. Yuksel H, Yilmaz O, Sogut A, Ertan P, Onur E. Correlation of quality of life with clinical parameters and eosinophilic cation protein levels in children with allergic rhinoconjunctivitis. Int Arch Allergy Immunol 2009;148(1):18-22.

47. Jáuregui I, Mullol J, Dávila I, Ferrer M, Bartra J, del Cuvillo A, et al. Allergic rhinitis and school performance. J Investig Allergol Clin Immunol 2009;19(Suppl 1):32-9.

48. Wong HB, Machin D, Tan SB, Wong TY, Saw SM. Visual impairment and its impact on health-related quality of life in adolescents. Am J Ophthalmol 2009;147(3):505-511.e1.

49. Uretmen O, Kesikci H, Erermis S, Kose S, Pamukcu K, Aydin C. Could personality traits modify the response to uncorrected high hyperopia? J AAPOS 2005;9(5):480-4.

50. Rose K, Harper R, Tromans C, Waterman C, Goldberg D, Haggerty C, et al. Quality of life in myopia. Br J Ophthalmol 2000;84(9):1031-4.