

Psychiatric morbidity in children and adolescents with dermatological disorders

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Abstract

Background: Understanding the existence of a cycle, where psychological disturbances cause skin diseases and in turn, skin diseases cause psychological disorders, provides the basis for good dermatological practice.

Objective: The aim of this case-control study is to examine the psychiatric morbidity of dermatological disorders in children and adolescents with no history of psychiatric disorders.

Method: In this study, 502 participants (251 patients and 251 healthy individuals) were evaluated according to DSM-IV criteria. All participants were interviewed and evaluated using the Turkish version of the Kiddie Schedule for Affective Disorders and Schizophrenia – Present and Lifetime Version (K-SADS-PL) and the State-Trait Anxiety Inventory for Children (STAI-1 and STAI-2), the Childhood Depression Inventory (CDI), adolescent and parent forms of the Strengths and Difficulties Questionnaire (SDQ-A and SDQ-P) and a questionnaire evaluating child's level of school success.

Results: Our results indicated that the rates of general psychiatric comorbidity, mood disorders, anxiety disorders, and adjustment disorders were significantly higher in the study group compared to the control group. The CDI, STAI-1, STAI-2, and SDQ (and subscales) scores were significantly higher in the study group. Moreover, psychiatric comorbidity was higher in inflammatory and allergic dermatoses compared to other dermatological subgroups. Having a dermatological disease restricts physical activity thus increasing the risk of psychiatric comorbidity.

Conclusions: Investigating the education, attitudes, and awareness of dermatologists about psychocutaneous disorders might contribute to the development of new educational strategies and elicit appropriate biopsychosocial approaches.

Keywords: Dermatological diseases; psychiatric disorders; and children and adolescents

Introduction

Skin is a perfect protective coating with crucial functions somatic communication, sensory stimuli, and physical and emotional development (1, 2). The central nervous system and epidermis originate from the same embryological tissue and their interactions with each other in the later stages of life have become the subject of numerous studies (3). It is a prevalent opinion that in many cases psychological factors cause the dermatological disorders, or dermatological disorders are associated with certain personality traits, or dermatological disorders appear as a complication of psychiatric morbidity (4). Psychiatric comorbid diagnoses are estimated to be as high as

30% in all dermatology patients (5). Compared to adult population, our knowledge in the area of the co-occurrence of the dermatological disorders with psychiatric morbidity in the pediatric age group and their effects on the clinical course and treatment process is limited.

Studies show that in adolescence when secondary sexual characteristics start to develop, dermatological diseases may emerge concomitant with many psychiatric diseases, especially depression. While it is known that in children with dermatological disorders, information about the symptoms, triggers, and treatment is important, it has been shown that chronic dermatological disorders in particular can

negatively affect the quality of life (6, 7). Dermatologists can play an important role in the management of psychocutaneous disorders because patients seek help from dermatology clinics for treatment of their skin problems but generally refuse psychiatric intervention. Undetected psychopathology can greatly decrease a patient's quality of life and even contribute significantly to the clinical severity of their skin disease. Therefore, a multidisciplinary approach is important for evaluating the patients from this point of view and to provide them with appropriate support (8). The aim of this study was to determine the sociodemographic and clinical characteristics affecting psychiatric comorbidity by examining pediatric patients that were treated in the dermatology outpatient clinic.

Methods

The study was approved by the local ethics committee (Ethics Committee of the Inonu University, Faculty of Medicine, 04.12.2013 and 2013/163) and performed in accordance with the Declaration of Helsinki. Participants were assured of data confidentiality, and permission to use data for reports that ensured the protection of the participants' identities were obtained from all participants through informed written consent to participate, and their parents consented to their and their children's participation.

Participants and procedures

A total of 251 patients (6-18 years) who were treated in the Department of Dermatology Outpatient Clinic at Inonu University Faculty of Medicine between January 2014 and October 2015 were included in the study. All consecutive patients not suffering from chronic illness other than dermatological disorder, with no history of psychiatric disease were included. All patients in our study were under treatment for their dermatological condition or were not receiving new diagnosed treatment.

The control group consisted of 251 individuals who did not have any dermatological disorders and had similar demographic characteristics as the study group. The healthy control group consisted of children who applied to the pediatric outpatient clinics of the university hospital for general examination. DSM-IV criteria, the K-SADS-PL, STAI-1 and STAI-2, CDI and SDQ-A and SDQ-P were used as psychiatric assessment scales. Child and adolescent psychiatrists practicing K-SADS-PL were blinded to the study group.

Socio-demographic data form

This form was developed by the research team to determine the socio-demographic characteristics, i.e. age, sex, school success, family type, living place of

the parents and psychiatric/medical genealogical information. Also parents in charge of the children completed a questionnaire about their levels of school success. Parents were asked to classify every child's level of school success as level I – very bad, level II – bad, level III – medium, level IV – good and level V – the best.

Schedule for Affective Disorders and Schizophrenia for School Age Children-Present and Lifetime Version (K-SADS-PL)

A semi-structured interview form developed by Kaufman et al. (9) was used to determine past and present psychopathologies of children and adolescents according to DSM-IV diagnostic criteria. Turkish adaptation, validity and reliability study of K-SADS-PL-T was made by Gökler et al. (10).

Children's Depression Inventory (CDI)

CDI detects the level of depression in children (11) and was developed by Kovacs in 1981. The validity and reliability of the Turkish CDI version was performed by Oy in 1991 (12). This scale consists of 27 items. The score of each question varies between 0 and 2. A score of 19 and above is considered pathological.

State-Trait Anxiety Inventory (STAI-1 and STAI-2)

The inventory was developed by Spielberger et al. in 1970, and has two subscales: state (STAI-1) and trait (STAI-2) (13). There are 40 items in total, 20 items in each scale. STAI-1 determines how the individual feels at a certain moment and under certain conditions. STAI-2 generally determines how the individual feels, regardless of the situation and circumstances. The answers are scored between 1 and 4 on the 4-point Likert scale, and high scores indicate that the level of anxiety is high. The scale was adapted to Turkish by Öner and Le Compte in 1983 (14).

Strengths and Difficulties Questionnaire Forms (for parents and adolescents)

The Strengths and Difficulties Questionnaire (SDQ) is a 25-item Likert-type questionnaire developed by Robert Goodman in 1997 for the purpose of questioning emotional and behavioral problems together with some favorable characteristics of children and adolescents aged 4–16 years (15). Questions on the scale are answered by parents, teachers, and adolescents as “not correct”, “partially correct,” and “absolutely correct” and scored “0”, “1,” and “2,” respectively. Questions 7, 11, 14, 21, and 25 of the scale are scored by reversing.

It consists of five subscales related to emotional problems, conduct problems, and peer relationship

problems. Forms of this questionnaire designed for 4-16-year old individuals were to be responded by parents and teachers, and forms to be responded by 11-16-year -old adolescents themselves can be completed within nearly 5 minutes. The adaptation of SDQ to Turkish language was realized by Guvenir et al. in 2008 (16).

Statistical Analysis

SPSS for Windows (version 17.0) was used for statistical analysis of the data. Descriptions of quantitative variables were expressed as mean (\bar{x}) \pm standard deviation (s) and median (*Min-Max*), whereas qualitative data were expressed as numbers and percentages.

Unpaired and paired *t*-tests were used to compare variables with normal distribution according to the Kolmogorov-Smirnov normality test. Variables that were not normally distributed were compared using Kruskal-Wallis analysis of variance, the Conover double comparison test, and the Mann-Whitney U test. Qualitative variables were tested with Pearson's and Fisher's chi-square tests; $p < 0.05$ was considered to be statistically significant. Sample size of the population was determined by setting the prevalence of psychiatric morbidity in the control group as 20% and based on our calculations, the sample size of 246 was needed to detect a difference at 95% precision and alpha error of 0.05. We thus included 251 patients in the study.

Results

A total of 502 children and adolescents were included in the study. Of the 251 children in the study group, 93 (37.1%) were boys and 158 (62.9%) were girls; the control group consisted of 111 (44.2%) boys and 140 (55.8%) girls ($p = 0.102$). The sociodemographic characteristics of both groups are shown in Table 1.

The diagnoses in the study group included 55 (21.9%) inflammatory dermatoses (psoriasis, lichen

planus); 43 (17.1%) eczematous (seborrheic dermatitis, atopic dermatitis, hand eczema) and allergic dermatoses such as chronic urticarial; 42 (16.7%) acneiform dermatoses (acne vulgaris, rosacea); 36 (14.3%) hair and nail disorders (telogen effluvium, alopecia areata, nail changes); 32 (12.7) chronic infectious dermatoses (bacterial, viral, parasitic, and fungal), 24 (9.6%) pigmentation disorders such as vitiligo; 3 (1.2%) genetic dermatoses (incontinentia pigmenti, epidermolysis bullosa); and 16 (6.4%) chronic cutaneous disorders like dermatitis herpetiformis and other acute/transient conditions such as insect bites and pruritus. The distribution of the diagnoses of dermatological diseases is shown in Table 2.

The rates of general psychiatric comorbidity, mood disorders, anxiety disorders and adjustment disorders were significantly higher in the study group than in the control group (psychiatric comorbidity: $\chi^2 = 29.8$, $p = 0.0001$; mood disorders: $\chi^2 = 11.14$, $p = 0.001$; anxiety disorders: $\chi^2 = 11.54$, $p = 0.001$; adjustment disorder: $\chi^2 = 30.77$, $p = 0.0001$). There was no significant difference between the groups in terms of the other psychiatric disorders (Table 3).

The CDI, STAI-1, STAI-2 and SDQ (and subscales) scores were significantly higher in the study group compared to the control group (Table 4).

Among the dermatological disease subgroups only inflammatory, eczematous and allergic dermatoses had significantly higher rate of comorbidity with psychiatric disorders ($p = 0.016$ for psychiatric disorder frequency in inflammatory dermatoses; $p = 0.037$ for eczematous and allergic dermatoses) (Table 5). In addition, we also found that having a dermatological disorder increased the risk of psychiatric comorbidity by limiting physical activity ($p = 0.009$) (Table 6).

TABLE 1. Comparison of sociodemographic characteristics

Sociodemographic characteristics		Study N (%)	Control N (%)	χ^2 *	p
Gender	Male	93 (37.1)	111 (44.2)	2.67	0.102
	Female	158 (62.9)	140 (55.8)		
Residential place	City	182 (72.5)	226 (90)	25.34	0.0001
	Rural Area (Village + Town)	69 (27.5)	25 (10)		
School success	Successful	175 (72.9)	200 (81)	4.46	0.035
	Struggling	65 (27.1)	47 (19)		
Family type	Nuclear	184 (73.3)	214 (85.3)	10.91	0.0001
	Extended	67 (26.7)	37 (14.7)		
Psychiatric disease history in the family	Exists	30 (12)	23 (9.2)	1.03	0.309
	Does not exist	221 (88)	228 (90.8)		
Togetherness with both parents	Exists	229 (91.2)	232 (92.4)	0.23	0.625
	Does not exist	22 (8.8)	19 (7.6)		
		$\bar{X} \pm SS$	$\bar{X} \pm SS$	t^{**}	p
Age (6-18 years)		12.63 \pm 4.16	12.73 \pm 4.06	0.28	0.778
Number of siblings		2.46 \pm 1.77	2.08 \pm 1.53	2.55	0.011

Note. *Chi-square test, Chi-square value; ** Unpaired t test-value

TABLE 2. Diagnostic distributions of dermatological diseases

Dermatological disease	n	%
Inflammatory dermatoses	55	21.9
Ecematous and allergic dermatoses	43	17.1
Acneiform dermatoses	42	16.7
Hair and nail disorders	36	14.3
Chronic infectious dermatoses	32	12.7
Pigmentation disorders	24	9.6
Others (chronic cutaneous disorders)	10	4.0
Others (acute/transient conditions)	6	2.4
Genetic dermatoses	3	1.2
Total	251	100

TABLE 3. Comparison of psychiatric diagnosis distributions

K-SADS-PL and DSM-IV Diagnoses		Study N (%)	Control N (%)	X ²	p
Psychiatric Disorder	Exists	145 (57.8)	84 (33.5)	29.8	0.0001
	Does not Exist	106 (42.2)	167 (66.5)		
ADHD	Exists	57 (22.7)	49 (19.5)	0.76	0.382
	Does not Exist	194 (77.3)	202 (80.5)		
Disruptive behavior disorders	Exist	9 (3.6)	6 (2.4)	0.61	0.432
	Do not exist	242 (96.4)	245 (97.6)		
Mood disorders	Exist	35 (13.9)	13 (5.2)	11.14	0.001
	Do not Exist	216 (86.1)	238 (94.8)		
Anxiety disorders	Exist	37 (14.7)	14 (5.6)	11.54	0.001
	Do not Exist	214 (85.3)	237 (94.4)		
Psychotic disorder	Exists	1 (0.4)	-	1.00	0.317
	Does not Exist	250 (96.6)	251 (100)		
Speech disorder	Exists	2 (0.8)	3 (1.2)	0.20	0.653
	Does not Exist	249 (99.2)	248 (98.8)		
Tic disorders	Exist	4 (1.6)	2 (0.8)	0.67	0.411
	Do not Exist	247 (98.4)	249 (99.2)		
Adjustment disorder	Exists	29 (11.6)	-	30.77	0.0001
	Does not Exist	222 (88.4)	251 (100)		
Elimination disorders	Exist	13 (5.2)	11 (4.4)	0.17	0.676
	Do not Exist	238 (94.8)	240 (95.6)		
Somatoform disorders	Exist	1 (0.4)	1 (0.4)	0.00	1.00
	Do not exist	250 (99.6)	250 (99.6)		
Trichotillomania	Exists	1 (0.4)	-	1.00	0.317
	Does not Exist	250 (99.6)	251 (100)		
Tobacco use	Exists	4 (1.6)	6 (2.4)	0.40	0.523
	Does not Exist	247 (98.4)	245 (97.6)		
Sleep disorders	Exist	4 (1.6)	-	4.03	0.124
	Do not Exist	247 (98.4)	251 (100)		

Note. *Pearson Chi Square test

TABLE 4. Comparison of inventory scores

INVENTORY	STUDY	CONTROL	p*	
	Median (Min-Max)	Median (Min-Max)		
Depression	9 (0-39)	6 (0-35)	0.0001	
STAI-1	35 (20-71)	31(20-73)	0.0001	
STAI-2	45 (17-78)	41 (25-80)	0.0001	
SDQ-P	Total difficulty score	11 (0-28)	9 (1-31)	0.0001
	Emotional problems	3 (0-10)	2 (0-9)	0.0001
	Behavior problems	2 (0-7)	1 (0-8)	0.001
	Attention and activity problems	4 (0-10)	3 (0-10)	0.002
	Peer problems	3 (0-10)	2 (0-8)	0.0001
	Social behaviors	8(1-10)	9 (2-10)	0.009
SDQ-A	Total difficulty score	11(1-29)	9 (0-30)	0.0001
	Emotional problems	3(0-10)	2 (0-10)	0.001
	Behavior problems	1(0-7)	1 (0-8)	0.039
	Attention and activity problems	4 (0-9)	3.5 (0-10)	0.007
	Peer problems	3 (0-10)	2 (0-8)	0.001
	Social behaviors	9 (2-10)	9 (1-10)	0.064

Note. *Mann-Whitney's U test

TABLE 5. Psychiatric comorbidity frequency in dermatological disease sub-groups

Dermatological disease sub-groups	Psychiatric comorbidity (n=145)	No-psychiatric comorbidity (n=106)	X ²	p*
Inflammatory dermatoses	24 (16.6)	31(29.2)	5.76	0.016
Eczematous and allergic dermatoses	31 (21.4)	12 (11.3)	4.36	0.037
Acneiform dermatoses	25 (17.2)	17 (16.0)	0.06	0.801
Hair and nail disorders	24 (16.6)	12 (11.3)	1.36	0.243
Chronic infectious dermatoses	19 (13.1)	13 (12.3)	0.03	0.844
Pigmentation disorders	13 (9.0)	11(10.4)	0.14	0.707
Others (chronic cutaneous disorders)	7 (4.8)	5 (4.7)	0.63	0.525
Others (acute/transient conditions)	1 (0.7)	5 (4.7)	4.25	0.086
Genetic dermatoses	1 (0.7)	2 (1.9)	0.74	0.575

Note. *Pearson Chi Square test

TABLE 6. Frequency of psychiatric comorbidity incidence according to certain clinical features of dermatological diseases

Clinical Features	Psychiatric comorbidity (n=145)	No-psychiatric comorbidity (n=106)	X ²	p*
Restrictedness in physical activity	26 (17.9)	7 (6.6)	6.88	0.009
Chronicity	116 (80)	89 (84)	0.64	0.423
Having a relapsing course	89 (61.4)	64 (60.4)	0.026	0.872
Painfulness	10 (6.9)	11 (10.4)	0.96	0.325
Itchiness	51 (35.2)	29 (27.4)	1.72	0.189
Localization in visible place	94 (64.8)	66 (62.3)	0.17	0.676
Being systemic	21 (14.5)	17 (16)	0.11	0.734

Note. *Pearson Chi Square test

Discussion

In this study, we aimed to determine sociodemographic and clinical features that affect concomitant occurrence of dermatological diseases and psychiatric disorders in pediatric patients that were treated in a dermatology outpatient clinic. Analysis of the demographic distribution showed

that a higher number of individuals in the control group lived in the city (Table 1). Although Kaplan et al. (1995) reported that living in a rural area may be a risk factor for depression, Erol et al.'s study (1998) conducted in Turkey showed that people living in cities had higher rates of depression (17, 18). Therefore, in our study, the effect of place of

residence on psychopathology can be interpreted as limited. The children's school success levels in the questionnaire were determined by parents as level I – very bad, level II – bad, level III – medium, level IV – good and level V – the best. Levels 4 and 5 were grouped as successful, while levels 1, 2 and 3 were grouped as struggling. The school success rate of the study group was determined to be significantly lower than in the control group (Table 1). According to one study, school absenteeism (36.6%) and grade repetition (23.3%) constitute a significant problem in children with chronic illness, physical disability, and mental problems (19). Psychiatric disease history in the family was detected in 30 (12%) patients from the study group and in 23 (9.2 %) individuals in the control group (Table 1).

When dermatological diseases were divided into groups, the most common diseases were inflammatory dermatoses, followed by eczematous and allergic dermatoses (Table 2). Among the studies made in Turkey, Tekin et al. investigated the prevalence of dermatological diseases in children living in Zonguldak and the surrounding area and found eczema to be the most common disease (20). We believe that this difference can be attributed to the fact that in the aforementioned study they investigated the distribution of dermatological diseases individually, whereas in our study we looked at the distribution of the diseases classified according to their broader diagnosis. In our study, the rate of children and adolescents diagnosed with any psychiatric disease was significantly higher in the study group than in the control group. Similarly, psychiatric diagnoses were found in approximately one quarter (25.2%) of the patients with dermatological disease in a study of psychiatric comorbidity with 2579 patients (21). In our study, the scores for mood disorders were significantly higher in the study group compared to the control group. Since data on the relationship between dermatological diseases and mood disorders in the pediatric age group are limited compared to data for adult patients, we believe that our study provides important information in that regard. In a study by Dornelles da Silva Manzoni et al. (2012), evaluating the life qualities of 118 children aged 5–16 years who were treated at the dermatology polyclinics in Brazil, the rates of shyness, low self-confidence, anxiety, and depressive mood were found to be higher compared to control (22). In another study, anxiety and depression were found to be the most common psychiatric problems associated with dermatological diseases. The common and visible characteristics of skin diseases are often associated with anxiety, depression and low self-esteem (23). In our study, anxiety disorders were significantly higher in the dermatological disorders group (Table 3). In an

epidemiological study conducted in Turkey, it has been shown that anxiety disorders were the most frequently seen disorder (14.45%) in adolescents being treated in children's psychiatry clinics (24). Moreover, in a study on dermatological diseases by Vargas et al., anxiety disorder was screened by separating the dermatology patients into subgroups (psoriasis, acute urticaria, atopic dermatitis, and others) and anxiety disorder was detected in 48% of the psoriasis group and 39% of the atopic dermatitis group (25). In our study, the diagnosis of adjustment disorder was found to be significantly higher in the study group. Studies have shown that children and adolescents had difficulty in adjusting to their new condition after the disease was diagnosed, however in time they adjusted to the disease and their initial low quality-of-life perceptions improved (26). In a medical record review study that covered dermatology patients, it was found that the most prevalent psychiatric diagnoses in the patients were depressive disorder and adjustment disorders (27). Similarly, in our study, adjustment disorder was determined in 29 (11.6%) of the patients in the study group, as opposed to none in the control group (Table 3).

The CDI, STAI-1 and STAI-2 scores of the children in the study group were significantly higher compared to the control group (Table 4). These results indicate that the severity of both anxiety and depressive mood is higher in adolescents with dermatological disease than in healthy children. In one study, some adolescents with dermatological disease felt that they should be different by avoiding certain activities because they felt embarrassed about their appearance (28). Because adolescence is a special age with great physical and hormonal changes, it is also an important period for body image and self-presentation (29).

The SDQ-P (and subscales) scores filled out by the parents of the children were higher in the study group, indicating that these patients experienced more behavioral and emotional difficulties compared to the control group. It is expected that children and adolescents with dermatological diseases will have more difficulties than their otherwise healthy counterparts and that their mechanisms to cope with these difficulties might be less efficient.

The social behaviors subscale of the SDQ-P is a scale in which the current social strengths of the child and adolescent are questioned and evaluated. The higher the score, the lower the risk of psychiatric disorder. In our study, the evaluation of the SDQ-A and SDQ-P scores showed a significant difference between the study and control groups in all subscales except for the social behaviors subscale. This finding may be due to the fact that children and adolescents

are not aware of their current strengths and mechanisms for dealing with problems.

In our study, the incidence of psychiatric morbidity was found to be significantly higher in the inflammatory, eczematous and allergic dermatosis groups (Table 5). We believe that this increased rate is due to proinflammatory cytokines and some inflammatory processes being involved in the pathophysiology of depression and inflammatory diseases (30). Eczematous and allergic dermatosis groups may be intensively pruritic, or the angioedema may present with mild pain and burning sensation (31), symptoms that affect the patient's quality of life significantly and may account for stress, negative self-image, disability in social functions and adverse emotions such as anger and depression (32-34).

In our study, we investigated the frequency of psychiatric morbidity in the clinical variables of pediatric age group with dermatological diseases. It has been determined that restricted physical activity related to dermatological disease is a significant risk factor for frequency of psychiatric disorders (Table 6). One study has shown that the various clinical involvements associated with psoriasis have a direct effect on physical activity (35). In fact, physical limitation caused by dermatological disease decreases the quality of life and may result in emotional stress and psychiatric disease.

Conclusion

There is a real threat of psychiatric morbidity associated with dermatological disorders in the pediatric age group and if neglected this threat can negatively impact the children's mental health and quality of life. We would like to emphasize the need for close collaboration between psychiatry and dermatology disciplines in treating patients with psychocutaneous conditions.

Clinical significance

We believe that our study is a valuable addition to the literature because we focused on investigating psychiatric comorbidity in dermatological disorders in a child and adolescent population, which is an underrepresented study population. In addition, we used structured interview techniques and had a relatively large sample size and a control group that had matching sociodemographic characteristics.

Conflict of interest

The authors report no conflicts of interest.

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