Screening for Adolescent Anxiety Disorders in a Pediatric Emergency Department

Holly J. Ramsawh, Ph.D.[1], **Denise A. Chavira, Ph.D.**[1], **John T. Kanegaye, M.D.**[2,3], **Sonia Ancoli-Israel, Ph.D.**[1], **P. Jamil Madati, M.D.**[2,3], and **Murray B. Stein, M.D., M.P.H.**[1,4]

[1]Department of Psychiatry, University of California San Diego

[2]Department of Pediatrics, University of California San Diego

[3]Division of Emergency Medicine, Rady Children's Hospital San Diego

[4]Department of Family & Preventive Medicine, University of California San Diego

Abstract

Objectives—Adolescence is a time of increasing risk for some anxiety disorders. Scant data exist on adolescent anxiety in emergency department (ED) settings. We sought to characterize select clinical characteristics and healthcare utilization associated with anxiety disorders in a pediatric ED.

Methods—We screened a convenience sample of 100 adolescent-parent dyads presenting to the ED for the presence of child anxiety disorders using the 5-item *Screen for Child Anxiety Related Emotional Disorders,* parent (SCARED-P) and child (SCARED-C) versions. Additional demographic and clinical data were also collected.

Results—SCARED-P and SCARED-C screens identified probable anxiety disorder(s) in 26% to 33% of adolescent participants, respectively. Correlates of positive SCARED-C screens were female gender, asthma, presenting complaint involving headache or migraine, and school absenteeism due to physical problems. Correlates of positive SCARED-P screens were lower parental educational level, presenting complaint involving headache or migraine, and more medical specialty and total medical visits. Few anxious adolescents had received mental health services in the past six months. In multivariate models, female gender was independently associated with SCARED-C total score, and presenting complaint involving headache or migraine was independently associated with SCARED-P total score.

Conclusions—The current pilot data suggest anxiety disorders are more prevalent among adolescent ED patients than in the general population, but largely untreated. Several demographic and clinical variables may help to identify occult anxiety disorders. Greater awareness of anxiety disorders in this population may assist in redirecting a pattern of low use of mental health services but higher overall healthcare utilization.

Keywords

anxiety disorders; pediatric psychology; emergency medicine; mental health services

Corresponding author: Holly Ramsawh, Ph.D., University of California San Diego, 9500 Gilman Drive (0855), La Jolla, CA 92093-0855 USA phone: 858-534-6445 fax: 858-534-6460, hramsawh@ucsd.edu.

Introduction

Anxiety disorders are the most prevalent group of psychiatric disorders in the United States.[1] Almost one in every three youths between 13 and 18 years of age will meet criteria for an anxiety disorder in his or her lifetime,[2] suggesting a high burden of disease in adolescents relative to other common conditions like attention deficit/hyperactivity disorder (ADHD) and mood disorders.[2–5] In adults, anxiety disorders are associated with significant functional impairment, including lost wages and decreased quality of life.[6, 7] In youth, anxiety disorders may be associated with school absenteeism, school refusal, and poor academic performance.[8, 9] Anxiety-related conditions tend to have a chronic course,[10] particularly with early onset,[11] and they often precede adult psychiatric illness, including depressive and substance use disorders.[12, 13]

Many individuals with anxiety and other psychiatric disorders receive mental health services in the general medical sector.[14–16] Pediatric data are somewhat limited; however, the available data suggest that approximately one of every five pediatric primary care patients meets diagnostic criteria for an anxiety disorder.[17] There is even less information available on the prevalence of anxiety disorders in pediatric acute care settings. In a relatively young (mean age 7 years) pediatric emergency department (ED) sample, 45% of non-acute patients had a probable mental disorder, with most meeting criteria for one or more anxiety disorders.[18] Because the prevalence of some anxiety disorders increases in adolescence,[1] it is possible that an older pediatric sample will evidence high rates of anxiety disorders. In another recent report, almost 80% of pediatric patients presenting to an ED with unexplained chest pain met criteria for anxiety disorder(s).[19] Therefore, anxiety disorders may be a common occurrence in pediatric ED settings.

As psychiatric conditions are found frequently in adult ED patients, and individuals with psychiatric conditions are less likely to have health insurance,[20] a substantial economic burden may be associated with anxiety disorders in emergency medical settings. Thus, further examination of the occurrence and correlates of psychiatric conditions including anxiety disorders in ED settings is warranted. The primary goal of the current study was to identify probable anxiety disorders in adolescent patients presenting to a pediatric ED using a brief screening tool. We also examined select demographic and clinical correlates including somatic complaints and medical comorbidity, and factors associated with public health burden such as school absenteeism and health care utilization.

Materials and Methods

Participants and Setting

Participants were a convenience sample of 100 adolescents aged 13–17 years and an accompanying parent/guardian presenting to the ED of an urban, tertiary care children's hospital. Eligible adolescents presented for evaluation of acute medical and surgical complaints but were hemodynamically stable and were able to provide assent. Exclusion criteria included acute medical problems that warranted immediate intervention (resuscitation, intubation), primary psychiatric or substance-related condition (e.g., psychosis, suicidal ideation or self-injurious behaviors, drug overdose), altered mental status, absence of an accompanying parent or legal guardian, inadequate English-speaking skills of either child or parent as judged by research staff, and developmental disability (as judged by parental report of diagnosis or use of special education services). A combined hospital and university institutional review board approved this investigation, and all participants gave informed, written consent to participate.

Procedure

Adolescent-parent dyads was recruited from the ED by the first author (a clinical psychologist), attending physicians, and medical trainees primarily during early evening hours between February 2009 and August 2010. Medical staff familiar with the study identified families who appeared to meet inclusion criteria. Of these families, those who indicated to medical staff they were willing to hear about a research study were approached for possible enrollment in the ED examination room.

Study Measures

Because of time limitations in the ED setting, we screened for probable anxiety disorders using the 5-item version of the Screen for Child Anxiety Related Emotional Disorders (SCARED).[21] The 5-item SCARED (Tables 1 and 2) is a brief self-report measure of anxiety symptoms that assesses five common anxiety domains, including separation anxiety, social phobia, panic/somatic, generalized anxiety, and school phobia symptoms. Total scores range from 0 to 10, and both parent (SCARED-P) and child (SCARED-C) versions of the measure were utilized in the study. The SCARED instructs respondents to indicate their level of agreement with statements about child anxiety symptoms using a three-level Likert-type response scale. The SCARED has good internal consistency, test-retest reliability, discriminant validity, and convergent validity.[21–23] The 5-item version of the SCARED has psychometric properties comparable to the full 41-item version, and has a sensitivity of 74% and specificity of 73% using a cutoff score of 3 for discriminating anxiety from non-anxiety.[21]

On a one-page questionnaire, a parent of each child participant provided demographic data along with information regarding the nature of the presenting complaint, current medical conditions being treated, school absenteeism, health insurance, and use of health services. ED presenting complaints were classified by the reference to any one of three commonly reported physical symptoms in anxious youth:[24–26] abdominal pain, chest pain, and headache/migraine. Presenting complaint categories were not mutually exclusive. School absenteeism was defined as the approximate number of days the child missed school or left early due to physical problems in the past six months. Health services utilization was defined as total outpatient medical visits in the past six months, which was the sum of parent-reported visits to EDs, pediatric offices or clinics, and medical specialty clinics. We defined mental health service utilization as one or more visits to mental health specialists (e.g., psychologist, family therapist) in the past six months. Triage acuity level was the numerical assessment of severity (1 = least severe, 5 = most severe) assigned by an ED nurse on presentation.

Statistical Analysis

All statistical analyses were conducted using Predictive Analytics SoftWare Statistics Version 18 (SPSS Inc., Chicago, IL). Given the relatively poor concordance between parent and adolescent reports and the resultant recommendation to obtain both reports for adolescents with suspected anxiety disorders,[27] analyses were run separately for SCARED-C and SCARED-P data. We compared demographic and clinical differences (at an alpha level of $p < .05$) between anxious and non-anxious adolescents using 'N – 1' chi-square tests for categorical variables,[28] and independent sample t-tests or Mann-Whitney U tests for continuous variables as appropriate. Due to the exploratory nature of this investigation, there were no corrections for multiple comparisons, and trends towards statistical significance (at an alpha level of p .1) are also reported. A hierarchical multivariate regression approach was used to identify variables independently associated with anxiety symptoms. Decisions regarding variables retained for regression analyses were informed both by the current between-groups analyses, and by prior work implicating certain demographic and clinical

variables associated with anxiety symptoms. SCARED-C and SCARED-P total scores served as outcome variables in regression analyses. Gender was entered in the first block; the second block included medical variables (presenting complaint involving headache/ migraine, positive asthma status); the third and final block consisted of variables associated with public health burden (total medical visits, school absenteeism due to physical problems). Regression residuals were checked for normality, linearity and homoscedasticity using diagnostic plots and skewness and kurtosis information. As some non-normality and heteroscedasticity of residuals were detected, casewise diagnostics and Mahalanobis distance tests results were examined to check for multivariate outliers. As the same two outliers were detected in both SCARED-C and SCARED-P regression analyses, these cases were removed from subsequent analysis. Regression models were rerun, with skewness and kurtosis being acceptable and diagnostic plots showing no significant departures from normality, linearity, or homoscedasticity.

Results

Of the 100 parent-child pairs enrolled, 33% screened positive for probable anxiety disorder using the SCARED-C, and 26% using the SCARED-P (Table 3). There was fair agreement between parent and child reports of probable anxiety disorder ($\kappa = .36$).

Adolescents who screened positive for anxiety on the SCARED-C were more likely to be female ($p < .001$), and they also had more school absenteeism due to physical problems in the past six months ($p = .046$). In addition, there were trends towards anxious adolescents being more likely to have a presenting complaint involving headache/migraine ($p = .070$), and having a positive asthma status ($p = .102$). Age, ethnicity, parental education level, triage level, presenting complaint involving abdominal pain or chest pain, total ED visits, total medical specialty visits, total pediatric office visits, and total medical visits in the past six months did not differ significantly. Anxious adolescents were no more likely to have received mental health services in the past six months than non-anxious adolescents ($p = .382$).

Adolescents who screened positive for anxiety on the SCARED-P were more likely than non-anxious adolescents to have a presenting complaint involving headache/migraine ($p = .039$), and they had more total medical visits in the past 6 months ($p = .049$). There were also trends towards anxious adolescents having more medical specialty visits ($p = .062$), being more likely to have received mental health services in the past 6 months ($p = .073$), and their parents being less likely to have obtained a bachelor's degree ($p = .071$),

Table 4 displays regression results for SCARED-C. The second and third blocks did not significantly improve the model, but the full model was significant, $F(5, 77) = 2.66$, $p = .029$. In the full model containing gender, presenting complaint involving headache/migraine, asthma, total medical visits, and school absenteeism due to physical problems, only gender was significant, $t(77) = 3.05$, $p = .003$, indicating that female gender is associated with higher SCARED-C scores. The total model accounted for approximately 15% of the variance in SCARED-C total score.

Table 5 displays regression results for SCARED-P. Although only the second block significantly improved the model, the total model was again significant, $F(5, 78) = 2.53$, $p = .035$. In the full model, only presenting complaint involving headache/migraine was significantly associated with higher SCARED-P total scores, $t(78) = 2.81$, $p = .006$. The total model accounted for approximately 14% of the variance in SCARED-P total score.

Discussion

The current study is a pilot investigation of the prevalence of anxiety disorders in a convenience sample of adolescent-parent dyads presenting to a pediatric emergency department. The demographic and clinical characteristics associated with anxiety were also examined. As psychosocial factors such as poor mental health contribute to increased frequency of adult ED visits,[29, 30] study of these factors among pediatric patients is warranted.

Between one-quarter and one-third of this convenience sample screened positive for probable anxiety disorders on the SCARED-P and SCARED-C, respectively. While considerable, this estimate is consistent with previously reported prevalence rates of anxiety disorders in pediatric medical settings.[17, 18, 31] For example, in one study the full 41-item version of the SCARED yielded prevalence rates of 15–25% in a pediatric primary care sample, depending on whether the parent or child version was being utilized.[31] Similarly, other investigators have found that 20–22% of children in primary care screened positive on the 5-item SCARED.[17] As 17% of the same sample screened positive for anxiety disorders on a concurrent "gold standard" diagnostic instrument, this suggests that the 5-item SCARED yields a relatively accurate estimate of anxiety disorders in pediatric medical settings.

Certain demographic characteristics were found to be associated with anxiety disorders in the current study. First, females were overrepresented among adolescents who screened positive on the SCARED-C. Female gender also emerged as an independent predictor of anxiety symptoms in multivariate models, which is in keeping with an increased female vulnerability to anxiety disorders.[1] In addition, there was a trend for parents of adolescents who screened positive on the SCARED-P to be less likely to have a bachelor's degree. The relationship between lower parental education and child psychopathology is not clearly understood.[32, 33] As a proxy for socioeconomic status, lower parental education may be associated with environmental risk factors which render youth more susceptible to anxiety disorders, or with other factors which predispose to anxiety.

We also found effects for several clinical characteristics related to medical comorbidity and somatic symptoms. Specifically, there was a trend for adolescents with positive SCARED-C screens being more likely to have asthma, which is in accordance with a previously reported relationship between asthma and anxiety disorders.[34–38] In one prior investigation, as many as one in four patients attending a pediatric asthma clinic met criteria for a probable anxiety disorder.[39] In addition, we examined three common somatic complaints in anxious youth— abdominal pain, headache or migraine, and chest pain. Presenting complaints involving headache or migraine were associated with SCARED-P positive screens, and were also associated with positive SCARED-C screens at the trend level. In addition, headache or migraine-related presenting complaints emerged as an independent predictor of anxiety symptoms in SCARED-P multivariate models. The lack of association of either abdominal or chest pain with anxiety was unexpected given the available literature suggesting strong associations with anxiety disorders.[19, 24, 40, 41] Among adult migraine patients, frequent ED use for headache complaints is associated with elevated trait anxiety.[42] Thus, it is possible that anxious ED patients have a distinct clinical presentation with regard to somatic complaints. Future research on anxiety disorders in pediatric ED patients should also examine presenting complaints featuring these and other common somatic symptoms, given the robustness of the association with headache or migraine found in the current pilot study.

Finally, we investigated public health burden associated with adolescent anxiety disorders in the ED via an examination of school absenteeism and health care utilization. Per the

SCARED-C, we found that anxious adolescents had more school absenteeism due to physical problems in the past six months than adolescents without probable anxiety disorders. Prior studies have found that the presence of somatic symptoms is associated with school absenteeism or school refusal among anxious children.[9, 43, 44] Adolescents who screened positive on the SCARED-P in the current study had more total medical visits in the past six months, and there was also a trend for more medical specialty visits. There were no differences between groups in the number of ED or pediatrician's office visits. The extant literature also suggests higher healthcare utilization for children with anxiety or depression, although few studies have examined healthcare service use in anxious children in particular.[39, 45–47] Therefore, the current findings give credence to the notion that anxious youth are more frequent users of the healthcare system. Despite this, less than one in five anxious adolescents in the current study had received mental health services in the past six months. This underutilization of mental health services is in accordance with current literature--despite the relatively high prevalence of childhood anxiety disorders in the community, anxiety disorders are among the least likely psychiatric conditions to be treated relative to other childhood disorders such as ADHD.[14, 17]

There are several limitations to the current study. First, the current sample was chosen as a sample of convenience and not a random or consecutive sample of ED patients. Furthermore, the number of patients who indicated that they did not wish to be approached, or who declined participation when approached, was not systematically tracked. Given the busy ED environment, particularly during the hours when study recruitment took place, this was not possible. However, the majority of patients approached were enrolled in the study and few declined. Nonetheless, the current participants may differ from most ED patients seen during the study period. Second, an additional source of selection bias may have been introduced by the exclusion of families in which either the parent or child was not fluent in English. Since a large segment of the study hospital's ED patient population speaks a primary language other than English, future studies should examine the prevalence and clinical characteristics of anxiety disorders in these patients. Third, study variables such as number of medical visits, medical comorbidity, and chief complaint were provided by parent self-report and were not independently verified from medical records. Fourth, there were no corrections for multiple comparisons in this pilot study. Finally, the psychometric properties of the 5-item SCARED have not been established in ED settings. Because the SCARED's false positive rate in the current study is unknown, the rate of probable anxiety disorders could be inflated if the stressful environment of the ED led to greater endorsement of anxiety symptoms. However, as the SCARED measures trait, not state anxiety symptoms, this possibility is unlikely. While confirmation of psychiatric conditions following positive screens by way of a full diagnostic evaluation is typically recommended, this was beyond the scope of the current pilot study. It would be important for future investigations to examine psychometric properties of the SCARED in acute care settings.

There were also several strengths to this study. One strength is the use of a brief, well-validated self-report measure of symptoms indicating probable anxiety disorders. A second strength of the study is that we excluded patients with overtly psychiatric presenting complaints to avoid overestimating prevalence. A third strength is that few prior studies have examined the occurrence of anxiety disorders in ED settings, particularly pediatric EDs. Finally, to our knowledge, no prior pediatric studies have examined anxiety disorders in adolescent ED patients in particular.

There are several potential barriers to screening for anxiety disorders in the ED that deserve consideration. These include time constraints, lack of appropriate referrals for follow-up care, and perhaps a belief among providers that screening for psychiatric symptoms not clearly related to presenting complaint is outside of their domain of practice. However, there

is now increasing recognition of the role that ED providers can play in children's mental health.[48] Given that anxiety disorders were associated here with increased overall healthcare utilization and school absenteeism, yet few anxious adolescents ED patients were receiving current mental health treatment, screening and either the initiation of or referral to mental health services in the ED seems imperative.

There are several questions to consider regarding screening: 1) Who should be screened—all pediatric ED patients, or only those that have certain risk factors as identified in the current study and elsewhere? 2) Who should be responsible for screening—ED physicians, nursing staff, or other ED personnel? 3) Should treatment referral or the initiation of services be instituted at the time of the ED visit, or at a later point? Regarding the first question, the brevity of the SCARED would allow it to be administered as part of routine care to all children; this also avoids the risk of some patients feeling stigmatized, as may be the case with more selective screening.[49] As for who should do the screening, one possibility that bears consideration is computerized screening, as other investigators have developed a brief, computerized self-administered psychiatric screening tool for adolescents.[50] Finally, regarding management of positive screens, further evaluation to confirm presence of an anxiety disorder may not be practical in the ED. Since children who screen positive for anxiety disorders in EDs may be unlikely to follow-up with outpatient psychiatric referrals,[51] one option for educating families and opening the door to eventual treatment linkage could be the provision of educational materials/brochures that discuss anxiety disorder features, normalize these symptoms, and provide online resources as well as local referral information.

Conclusions

The current pilot investigation suggests that there is a high proportion of probable occult anxiety disorders in adolescents presenting to pediatric EDs for non-psychiatric complaints. Several demographic and clinical variables, such as female gender and presenting complaint involving headache or migraine, may aid in identifying these individuals. Although most anxious adolescents in the current sample were not receiving mental health services, they had more frequent medical visits and school absenteeism relative to adolescent without anxiety disorders. Greater awareness of anxiety disorders in adolescent ED populations among providers may help to redirect this pattern of service utilization. Future investigators should explore the utility of developing brief, cost-effective interventions or referral methods that fit the needs and preferences of this population.

Acknowledgments

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Table 1

5-item Screen for Child Anxiety Related Emotional Disorders, Child Version. (SCARED-C)[21].

SCARED (Child Version)			
Directions: Below is a list of sentences that describes how people feel. Read each phrase and decide if it is "Not true or hardly ever true" or "Somewhat true or sometimes true" or "Very true or often true" for you. Then for each sentence, fill in one circle that corresponds to the response that seems to describe you for <u>the last 3 months.</u>			
	Not true or hardly ever true	**Somewhat true or sometimes true**	**Very true or often true**
I am shy.	0	1	2
People tell me that I worry too much.	0	1	2
I am scared to go to school.	0	1	2
I get really frightened for no reason at all.	0	1	2
I am afraid to be alone in the house.	0	1	2

Note. Developed by Boris Birmaher, M.D., Suneeta Khetarpal, M.D., Marlane Cully, M.Ed., David Brent M.D., and Sandra McKenzie, Ph.D., Western Psychiatric Institute and Clinic, University of Pittsburgh. (10/95). E-mail: birmaherb@msx.upmc.edu

Table 2

5-item Screen for Child Anxiety Related Emotional Disorders, Parent Version. (SCARED-P)[21].

SCARED (Parent Version)			
Directions: Below is a list of statements that describes how people feel. Read each statement carefully and decide if it is "Not true or hardly ever true" or "Somewhat true or sometimes true" or "Very true or often true" for your child. Then for each statement, fill in one circle that corresponds to the response that seems to describe your child for <u>the last 3 months</u>. Please respond to all statements as well as you can, even if some do not seem to concern your child.			
	Not true or hardly ever true	**Somewhat true or sometimes true**	**Very true or often true**
My child is shy.	0	1	2
People tell me that my child worries too much.	0	1	2
My child is scared to go to school.	0	1	2
My child gets really frightened for no reason at all.	0	1	2
My child is afraid to be alone in the house.	0	1	2

Note. Developed by Boris Birmaher, M.D., Suneeta Khetarpal, M.D., Marlane Cully, M.Ed., David Brent M.D., and Sandra McKenzie, Ph.D., Western Psychiatric Institute and Clinic, University of Pittsburgh. (10/95). E-mail: birmaherb@msx.upmc.edu

Table 3

Demographic and clinical characteristics of the sample by SCARED screening results.

	SCARED-C		SCARED-P	
	Positive (n = 33)	Negative (n = 67)	Positive (n = 26)	Negative (n = 74)
Age in years, M (SD)	14.9 (1.4)	14.7 (1.3)	14.8 (1.2)	14.8 (1.4)
Female, n (%)	28 (84.8)	32 (47.8) [***]	19 (73.1)	41 (55.4)
Ethnicity, n (%)				
Hispanic	10 (30.3)	24 (35.8)	10 (38.5)	24 (35.8)
Non-Hispanic				
White	18 (54.5)	26 (38.8)	13 (50.0)	31 (41.9)
Black	1 (3.0)	9 (13.4)	0	10 (13.5)
Other	3 (9.0)	6 (7.0)	2 (3.6)	7 (10.5)
Parental educational level, n (%w/bachelor's)	8 (24.2)	21 (31.3)	4 (15.4)	25 (33.8) [†]
Parent marital status, n (%married)	21 (63.6)	37 (55.2)	12 (46.2)	46 (62.2)
Private insurance, n (%)	20 (60.6)	44 (65.6)	15 (57.7)	49 (66.2)
Triage level, M (SD)	3.0 (0.7)	2.9 (0.9)	3.0 (0.9)	2.9 (0.8)
Currently treated for asthma, n (%)	6 (18.2)	5 (7.4) [†]	5 (19.2)	6 (8.1)
Chief complaint, n (%)				
Abdominal pain	5 (15.2)	9 (13.4)	5 (19.2)	9 (12.2)
Headache/migraine	9 (27.3)	8 (11.9) [†]	8 (30.8)	9 (12.2) [*]
Chest pain	1 (3.0)	2 (3.0)	0 (0.0)	3 (4.1)
Total medical visits past 6 mos[a]	5 (3–6)	4 (2–7)	5 (4–7)	4 (2–6.25) [*]
ED visits	1.5 (1–3)	2 (1–3)	2 (1–3)	2 (1–3)
Pediatric office visits	2 (1–4)	2 (0–3)	2.5 (1–4)	2 (1–3)
Medical specialty visits	0 (0–1.75)	0 (0–1)	1 (0–2)	0 (0–1) [†]
Mental health treatment in past 6 mo, n (%)	2 (6.0)	8 (11.9)	5 (19.2)	5 (7.4) [†]
School absenteeism due to physical problems[a]	4 (1–10)	2 (0–7) [*]	3 (1–8.75)	3 (0–7)

[***]
p .001

[**]
p .01

[*]
p .05.

[†]
p .1

[a] Due to skewness, medians and interquartile ranges are displayed for selected data.

Table 4

Multiple regression estimating the association between study variables and SCARED-C total score.

Predictors	R²	F	B	SE B	β	p-value	Cohen's f²
Step 1: Gender	.12	11.03	.95	.29	.35	.001	.14
Step 2: Gender	.13	4.05	–.89	.29	–.32	.003	.15
Headache/migraine			.43	.39	.12	.271	
Asthma			.06	.46	.01	.893	
Step 3: Gender	.15	2.66	–.90	.30	–.33	.003	.17
Headache/migraine			.37	.39	.10	.354	
Asthma			.03	.48	.01	.943	
Total medical visits			–.02	.03	–.08	.483	
School absenteeism due to physical problems		.02	.02	.12	.296		

SCARED-C = Screen for Child Anxiety Related Emotional Disorders, Child version.

Table 5

Multiple regression estimating the association between study variables and SCARED-P total score.

Predictors	R^2	F	B	SE B	β	p-value	Cohen's f^2
Step 1: Gender	.03	2.36	.53	.34	.17	.128	.03
Step 2: Gender	.14	4.22	.30	.34	.10	.375	.16
Headache/migraine			1.25	.43	.31	.005	
Asthma			.80	.52	.16	.131	
Step 3: Gender	.14	2.53	−.31	.34	−.10	.359	.16
Headache/migraine			1.24	.44	.31	.006	
Asthma			.89	.56	.18	.113	
Total medical visits			−.02	.04	−.05	.676	
School absenteeism due to physical problems			−.01	.03	−.02	.850	

SCARED-P = Screen for Child Anxiety Related Emotional Disorders, Parent version.