

Prevalence and risk factors of unexplained somatic symptoms in school-aged children of Sharkia Governorate

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Received 16 March 2011

Accepted 19 May 2011

Middle East Current Psychiatry
2011, 18:231–236

Background

Somatization in children consists of the persistent experience and complaints of somatic distress that cannot be fully explained by a medical diagnosis. The aim of this study was to determine the prevalence and risk factors of unexplained somatic symptoms and their relation to emotional symptoms in school-aged children.

Participants and methods

The sample included 294 children recruited from four primary schools of Sharkia Governorate. All the children were between 6 and 12 years of age, were from both sexes, and had no social limitation. All participants were subjected to psychiatric assessment for somatic symptoms by the Children's Somatization Inventory. They were also assessed for depression by the Child Depression Inventory and for anxiety by the Revised Children's Manifest Anxiety Scale.

Results

The prevalence rate of somatic symptoms was 13%, that of depression was 9%, and that of anxiety was 21%. Somatic symptoms were correlated with emotional symptoms.

Conclusion

This study concluded that there was a high rate of somatic and emotional symptoms in school children that were interrelated with sociodemographic characteristics.

Keywords:

children, emotional symptoms, pain, unexplained somatic symptoms

Middle East Curr Psychiatry 18:231–236

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2090-5408

Introduction

Physical symptoms or painful complaints of unknown etiology are fairly common among children [1,2]. In the general population, 2–10% of children have been documented as having recurrent pains or gastrointestinal (GI) symptoms, or have been described as sick [3,4]. Somatization in children consists of the persistent experience and complaints of somatic distress that cannot be fully explained by a medical diagnosis. The somatic symptoms in children with somatization disorder become the main focus of their attention and often interfere with school, home life, and peer relationships [5]. Symptoms are often medically unexplained and linked to psychological problems [1,3]. Complaints of limb pain, aching muscles, fatigue, and neurological symptoms, especially pseudoseizures, appear to increase with age [6]. According to the latest edition of the *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition-Text Revision (DSM-IV-TR; American Psychiatric Association) [7], somatic complaints as seen in somatization disorder can be allocated into four domains: (a) pain symptoms (e.g. headache, stomachache, back pain), (b) GI symptoms (e.g. nausea, vomiting, diarrhea), (c) sexual symptoms (e.g. sexual indifference, erectile dysfunction, irregular

menses), and (d) pseudoneurological symptoms (e.g. conversion symptoms such as impaired coordination, paralysis, loss of touch sensation). Eight criteria were required for a diagnosis (four different pain sites, two GI symptoms, one sexual symptom, and one pseudoneurological symptom). Somatization often occurs in response to psychosocial stress and generally persists even after the acute stressor has resolved, resulting in the belief by the child and family that the correct medical diagnosis has not yet been found [8]. Psychological stress may result in numerous physical effects, including the following: stress affects immune responses through the hypothalamus–pituitary–adrenal axis and the sympathetic nervous system, and neurotransmitters are released, triggering various GI responses such as gut dysmotility and recurrent abdominal pain. Nonspecific inflammatory changes can be found on biopsy specimens at all levels of the GI tract, suggesting that immunomodulation plays a role in the pathogenesis of the symptom [6]. Emotional distress can cause muscular pains and headaches through increased muscular tension. Psychologically induced changes in behavior, such as compulsive activity or prolonged bed rest, lead to secondary physiologic changes and attendant symptoms [6]. Thus, patients and families may continue to seek repeated medical treatment after

being informed that no acute medical illness has been found and that the symptoms cannot be fully explained by a medical diagnosis. It is generally well accepted that stress and worry can take a physical toll and can be the hidden source of chest pain, headache, stomachache, and backache [9]. Somatic complaints can be the presenting and/or comorbid symptoms of childhood depression and anxiety disorders [10,11]. Conscious and unconscious worries can lead to somatic symptoms with a spectrum of degrees of severity in almost every organ system [8]. Even though symptoms are often medically unexplained, they can lead to considerable impairment in the child's life, affecting development, school, and social adjustment [12]. Associations with psychological symptoms are especially marked in children with multiple somatic complaints [13.] Many prepubertal children may experience psychological distress in the form of somatization symptoms. Headache and recurrent abdominal pain are frequently reported painful somatic symptoms in children younger than 13 years of age, [14] with 10–30% of school-aged children and adolescents reporting symptoms as often as weekly [15,16]. The morbidity associated with unexplained pediatric somatic complaints can be significant. These children are more likely to be considered sick or health-impaired by parents, to be absent from school, and to perform poorly in academics. Somatoform disorders have been associated with impairment in functioning and with suffering for the child and family. They also lead to costly and dangerous medical investigations and treatments [8]. Hence, the aim of this study was to determine the prevalence and risk factors of unexplained somatic symptoms and their relation to emotional symptoms in a sample from school-aged children of Sharkia Governorate, Egypt.

Participants and methods

This study was conducted from 1 April 2010 to 1 December 2010. The study sample included 294 children recruited from three general schools and one private primary school in Sharkia Governorate. Children included in the study were between 6 and 12 years of age, were from both sexes, with no social and educational limitations, and lived with their parents. Children with a past history of psychotic or physical disorder or any chronic disease were excluded from the study. An informed written permission was obtained from the Ministry of Education of Sharkia Governorate, and a written consent was received from the parents or legal guardians of participating children. Oral permission was also obtained from the children.

Complete physical examination and relevant investigations were conducted as indicated to exclude any organic disease. Those patients with explainable organic causes for the symptoms were excluded from the evaluation. Pubertal stage was assessed using the Tanner criteria [17]. Of the children, 209 (71%) were prepubertal (Tanner stage 1) and 85 (29%) were early pubertal (Tanner stages 2 and 3).

The mental state of the participants was examined according to the DSM-IV-TR criteria. A specially designed semistructured interview, derived from the Psychiatric Department sheet of Zagazig University (Egypt), to obtain clinical data, to confirm diagnosis, and to know family history of psychiatric disorders was conducted.

The children's somatic symptoms were detected using the Children's Somatization Inventory (CSI), which covers a range of somatic complaints and produces four scales such as (a) pseudoneurological, (b) cardiovascular, (c) GI, and (d) pain/weakness problems. The CSI [18] is a self-report questionnaire comprising 35 items requiring individuals to report the extent to which they experienced each symptom in the previous 2 weeks (0 = not at all, 1 = a little, 2 = somewhat, 3 = a lot, 4 = a whole lot) [19–21]. Two scores are derived as follows: (a) the CSI total score (maximum = 140), which is the sum of all items reflecting both the range and intensity of experienced symptoms; and (b) the somatization score (maximum = 26) is the sum of 'a lot' or a 'whole lot' responses to the 26 items in the DSM-IV somatization disorder. The CSI has been shown previously to have adequate good internal reliability with coefficient α values in excess of 0.90 and adequate construct validity through moderate correlations (0.20–0.43) [20,21].

Depression in children was detected using the Child Depression Inventory, which is a standardized self-report questionnaire of depression [22]. It has been developed for children and young people of 6–17 years of age. The Child Depression Inventory includes 27 items, each scored on a 0–2 scale (from 'not a problem' to 'severe'), comprising symptoms observed for the previous 2 weeks. The total score ranges between 0 and 54, and a score of 19 has been found to indicate the likelihood of a depressive disorder [23].

Anxiety was determined using the Revised Children's Manifest Anxiety Scale, which is a standardized 37-item self-report questionnaire for children of 6–19 years of age [24]. It measures the presence or absence of anxiety-related symptoms ('yes/no' answers) in 28 items related to anxiety and in nine items pertaining to lies. A cutoff total score of 18 has been found to predict the presence of anxiety disorder in an Arab population [25].

Statistical analyses

The χ^2 analysis was used to compare the sociodemographic characteristics of the groups.

$$\alpha = \sum \frac{(O - E)^2}{E} \text{ where } \sum = \text{summation};$$

$O = \text{observed value};$
 $E = \text{expected value}$

Somatic symptoms, depression, and anxiety were correlated according to Pearson's correlation and analyzed using a personal computer using a statistical software

program Statistical Package for Social Studies (SPSS, version 13.0, SAS Institute, Cary, NC, USA, 2002) [26].

Results

The prevalence rate of somatic symptoms was 13%, that of depression was 9%, and that of anxiety was 21% in our children. Table 1 represents the sociodemographic characteristics of the study group. The mean age of the study group was 8.7 ± 1.2 years (range = 6–12 years). The female-to-male ratio was 1:3. The majority of the children were from urban areas (70%), belonged to a good home atmosphere (83%), went to public schools (92%), had good teacher communication (56%), employed parents (75%), and good family cohesion (51%). Abdominal pain (70%) and headache (67%) were the dominant presenting symptoms among somatoform disorders, followed by low energy (59%), nausea (50%), sore muscle (47%), weakness (41%), chest pain (40%), and lower back pain (38%). The mean total score of CSI was 22.1 ± 15.5 . Somatic symptoms were significantly higher in girls, in children with unemployed parents, and in children who studied in private schools ($P \leq 0.0001$ for each), but no significant difference in somatic symptom frequency was observed on the basis of residence, home atmosphere, teacher communication, and family cohesion (Table 2). However, depression was significantly higher in children who lived in urban areas ($P = 0.03$) with no effect of other demographic data (Table 3). Anxiety was significantly higher in girls, in children with unemployed parents, and in children who lived in urban areas ($P = 0.0001$, $P = 0.0001$, $P = 0.007$, respectively) but no significant difference was seen in somatic symptom frequency according to type of school, home atmosphere, teacher communication, and family cohesion (Table 4). Correlation was significantly positive between somatic

Table 1 Sociodemographic data of the study group

Variable	N [294 (100%)]
Sex	
Male	228 78%
Female	66 22%
Residence	
Rural	88 (30)
Urban	206 (70)
Home atmosphere	
Good	245 (83)
Bad	49 (17)
School state	
Public school	270 (92)
Private school	24 (8)
Teacher communication	
Good	164 (56)
Bad	130 (44)
Parents' occupation	
Employed	222 (75)
Unemployed	72 (25)
Family cohesion	
Good	154 (51)
Bad	140 (49)
Pubertal stage	
Prepubertal	209 (71)
Early pubertal	85 (29)
Age (mean $\pm$ standard deviation)	8.7 ± 1.2 (range: 6–12)

Table 2 Comparison between children's somatic symptom percentage according to sociodemographic data

Variable	Somatic symptom group [n=38 (13%)]	Normal group [n=256 (87%)]	χ	P value
Sex				
Male	20 (9)	208 (91)	15.5	0.000*
Female	18 (27)	48 (19%)		
Residence				
Rural	8 (9)	80 (91)	1.46	0.200
Urban	30 (14)	176 (86)		
Home atmosphere				
Good	34 (14)	211 (86)	1.18	0.276
Bad	4 (8)	45 (18)		
School type				
Public school	29 (11)	241 (89)	14.02	0.000*
Private school	9 (37)	15 (63)		
Teacher communication				
Bad	17 (13)	113 (87)	0.000	0.944
Good	21 (13)	143 (87)		
Parents' occupation				
Employed	16 (7)	206 (93)	26.33	0.000*
Unemployed	22 (30)	50 (70)		
Family cohesion				
Good	19 (12)	135 (88)	0.10	0.752
Bad	19 (15)	121 (85)		

* $P < 0.001$ (highly significant).

symptoms, depression scores, and anxiety scores and between depression and anxiety scores (Table 5).

Discussion

Research on somatization or functional disorders, characterized by the subjective study of physical symptoms in the absence of clear physical pathology, is limited in young children [6].

This study found that the prevalence rate of somatic symptoms was 13%, that of depression was 9%, and that of

Table 3 Comparison between children's depression percentage according to sociodemographic data

Variable	Depressed [n=26 (9%)]	Normal [n=268 (91%)]	χ	P value
Sex				
Male	20 (9)	208 (91)	0.01	0.935
Female	6 (9)	60 (91%)		
Residence				
Rural	3 (3)	85 (97)	4.600	0.031*
Urban	23 (11)	183 (89)		
Home atmosphere				
Good	22 (9)	223 (91)	0.031	0.854
Bad	4 (8)	45 (92)		
School type				
Public school	24 (11)	246 (99)	0.010	0.926
Private school	2 (9)	22 (91)		
Teacher communication				
Bad	15 (12)	115 (88)	2.102	0.147
Good	11 (7)	153 (93)		
Parents' occupation				
Employed	20 (10)	202 (90)	0.030	0.861
Unemployed	6 (9)	66 (91)		
Family cohesion				
Good	15 (10)	139 (90)	0.320	0.570
Bad	11 (8)	129 (92)		

* $P < 0.05$ (significant).

Table 4 Comparison between anxiety percentage according to sociodemographic data

Variable	Anxiety [n=62 (21%)]	Normal [n=232 (79%)]	χ^2	P value
Sex				
Male	37 (16)	191 (84)	13.73	0.000*
Female	25 (37)	41 (63)		
Residence				
Rural	10 (11)	78 (89)	7.14	0.007*
Urban	52 (25)	154 (75)		
Home atmosphere				
Good	48 (20)	197 (80)	0.9	0.15
Bad	14 (28)	35 (72)		
School type				
Public school	58 (21)	212 (79)	0.31	0.579
Private school	4 (17)	20 (83)		
Teacher communication				
Bad	31 (24)	99 (76)	1.07	0.302
Good	31 (19)	133 (81)		
Parents' occupation				
Employed	36 (16)	186 (84)	12.93	0.000*
Unemployed	26 (36)	46 (64)		
Family cohesion				
Good	31 (20)	123 (80)	0.180	0.672
Bad	31 (22)	109 (78)		

* $P < 0.001$ (highly significant).

anxiety was 21% in studied children. Similarly, Garber *et al.* [19] found that more than half of the school-aged children reported experiencing at least one serious somatic symptom, with 15.2% endorsing four or more serious complaints. These rates were somewhat lower than those found in another study by Rask *et al.* [27], who found that the prevalence of somatic symptoms was 23.2% in a study on children of 5–7 years of age in Copenhagen. This difference may be due to the smaller sample size, older children, higher sympathy, and social support in eastern countries than in western countries. The possibility of false results in the Arabic community is higher because of the stigma that parents attach to reporting that their children suffer from a psychiatric disorder. The increased reporting of somatic symptoms in younger children may be due to an inability to verbalize emotional distress [28]. This study observed significantly higher somatic symptoms in girls, in children with unemployed parents, and in children studying in private schools. Before puberty there was no difference in the prevalence of somatic symptoms between boys and girls [8]. However, adolescent girls tended to report nearly twice as many functional somatic symptoms compared with adolescent boys [29]. In this study, 29% of studied children were in early pubertal stage. The physiological and neurobiological changes associated with

puberty may play a role in these sex and age differences. In fact, experts on adolescent development have long considered puberty as a precursor of mood and behavioral changes [30]. Studies have found that advanced pubertal status in girls is associated with the frequency of somatic symptoms [31]. With regard to unemployed parents and type of school, we found that children who study in private schools had higher somatic symptoms. Longitudinal data suggest that daily examination stressors in private schools and family contexts produce greater somatic distress in children with low social competence, and that social rewards maintain somatic symptoms, especially when children have low self-esteem. Social disadvantage may compound these effects, particularly in children older than 7 years of age [32]. In addition, we did not find significant difference in the frequency of somatic symptoms on the basis of residence, home atmosphere, teacher communication, and family cohesion. This is in contrast to the study by Brown *et al.* [33], who suggested that patients with somatization disorder tended to have been raised in emotionally cold and unsupportive families that were characterized by chronic emotional and physical abuses. The results of this study show that anxiety was significantly higher in girls, in children with unemployed parents, and in children who lived in urban areas. Our results were consistent with some previous studies [19,28]. Our study found significant positive correlations between somatic and emotional symptoms, indicating adequate construct validity of the CSI. This is in agreement with the result of Muris *et al.* [34] and Toft *et al.* [35], who reported that anxiety was significantly positively associated with somatic symptoms. These results indicate that there might be common vulnerability factors in childhood anxiety and somatization symptoms. However, Karvonen [36] found that anxiety was independently associated with somatization symptoms, whereas mood disorders were not. However, Egger *et al.* [37] found that a quarter of respondents recognized a link between somatic symptoms and stress. These groups had higher somatic and emotional symptom scores, which is in line with the notion of increased stress reactivity in children with functional somatic symptoms [38,39]. In addition, research suggests that girls with anxiety disorders were five times more likely to report somatic complaints and had three times the prevalence of headaches compared with girls not diagnosed with an anxiety disorder [37]. Furthermore, children with comorbid disorders (i.e. anxiety, depression) reported more frequent somatic complaints compared with children without comorbidity [40]. The findings of this study indicate that children with comorbid anxiety and depression report more somatic symptoms. Hence, asking about the effect of stress on somatic complaints is a helpful screening tool for young people at high risk for somatization. Children's limbic hypothalamic–pituitary–adrenocortical and autonomic nervous systems have demonstrated hyperresponsivity to physically aversive events and psychologically stressful situations [41]. Heightened physiological reactivity is associated with internalizing behaviors in early and middle childhood [42]. In the clinical setting, children with somatic symptoms tend to be described

Table 5 Correlation between scores of somatic symptoms, depression, and anxiety

Variable	Somatic symptoms	Depression	Anxiety
Somatic symptoms	1	0.545 ^a	0.654 ^a
		0.028	0.011
Anxiety	0.654 ^a	0.721 ^a	1
	0.011	0.019	
Depression	0.545 ^a	1	0.721 ^a
	0.028		0.019

^aStatistically significant according to r value.

as conscientious or obsessive (perfectionistic), sensitive, insecure, and anxious [2]. Children with these temperamental vulnerabilities are hypothesized to be at risk for developing anxiety disorders and are more likely to generate distress responses to potentially threatening or uncertain stimuli [43].

Conclusion

This study concludes that there are high rates of somatic symptoms and emotional disorders among Egyptian school children and these are strongly interrelated with sociodemographic characteristics.

Recommendation

Future research should develop and establish a new construct of child somatization that is easily quantifiable and based upon information drawn from a wide variety of independent sources such as parents' interview and self-report, child interview, and several child medical measures. Somatization can be considered as an important clinical and socioeconomic problem. Thus, early diagnosis and treatment by primary healthcare physicians, rather than psychiatrists, will lead to improved clinical outcomes and physical functioning and reduce healthcare costs.

Acknowledgements

Conflicts of interest

There is no conflict of interest to declare.

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الملخص العربي

معدل إنتشار الأمراض النفسية وعوامل الخطر لأطفال المدارس المصرية

تمت الدراسة على 294 طفل من أطفال مدارس محافظة الشرقية لدراسة معدل انتشار الأمراض النفسية عند أطفال المدارس ومدى ارتباط هذه الأمراض بالحالة النفسية والاجتماعية للأطفال، تم استخدام مقياس الحالة النفسية للأطفال للأطفال لقياس نسبة الاعراض النفسية عند أطفال المدارس، وتم استخدام مقياس اكتئاب الطفل لقياس نسبة الاكتئاب لدى هؤلاء الأطفال، وتم قياس نسبة التوتر عندهم باستخدام مقياس التوتر الظاهر الراجع للأطفال. كانت نسبة الاعراض النفسية 13 %، و كانت نسبة الاكتئاب 9 %، ونسبة التوتر 21 % وخلصت الدراسة الى ان الأمراض النفسية مشكلة هامة شائعة بين أطفال المدارس وترتبط بالعوامل الاجتماعية والنفسية للأطفال، وتوصي الدراسة بالاهتمام بهؤلاء الأطفال . وان التشخيص المبكر والعلاج من قبل أطباء الرعاية الصحية الأولية و الأطباء النفسيين سوف يؤدي إلى تحسين النتائج السريرية و الوظائف البدنية وخفض تكاليف الرعاية الصحية.