Psychiatric assessment of Children with constitutional obesity

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Objectives

To determine the psychiatric disorders that accompany pediatric obesity and to compare boys and girls in terms of the presence of these disorders.

Methods

This is a descriptive cross-sectional outpatient study. The study sample included 52 overweight youngsters (26 girls and 26 boys) who presented to the endocrinology clinic in Abo-elrish pediatric hospital with increased body weight. The endocrinal profile revealed no abnormality and it was established as constitutional obesity. The following tools were applied: the Anxiety Scale for Children, the Depression Scale for Children, and the Self-Concept Scale and Behavioral Checklist for Children. Weight and height were measured and the adjusted BMI was calculated.

Results

Eight (15.4%) of the children were depressed, 16 (30.8%) were moderately anxious, and 10 (19.2%) were highly anxious. Twenty-four (46.2%) of the children had a low self-concept and 28 (53.8%) had a positive self-concept. The entire sample of children had an eating disorder. Comparative results of boys and girls showed that all girls were in the primary stage, whereas the boys were distributed throughout the stages of education. Four (15.4%) boys and girls were depressed. Half of the boys were not anxious, 10 (38.5%) of the other half were moderately anxious, and four (15.4%) of them were highly anxious. Six (23.1%) of the girls had moderate anxiety and another six (23.1%) were highly anxious. Sixteen (61.5%) of the girls had a low self-concept, whereas only eight (30.8%) of the boys had a low self-concept with a statistical significance ($P=0.050$). Eight (30.8%) boys and girls had a withdrawal problem. Eight (30.8%) boys had anxiety/depression and only four (15.4%) girls had anxiety/depression.

Conclusion

Low self-concept and eating disorders compensated for the absence of other psychiatric comorbidities, especially depression and anxiety.

Keywords:

depression, eating disorder, pediatric obesity, psychiatric disorders, self-concept

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Introduction

Obesity is being recognized as a serious public health concern because of its increasing prevalence in children and its many adverse health effects. Pediatric obesity is a condition in which excess body fat negatively affects a child's health or well-being. The diagnosis of obesity is often made on the basis of BMI (Kopelman *et al*., 2005); however, the term overweight rather than obese is often used in children as it is less stigmatizing (Bessesen, 2008).

Concerns about body dissatisfaction and low self-esteem in obese children and adolescents, especially girls, focus on deviation from societal body shape ideals and experience of social marginalization that reflects a broader stigmatizing view of obesity (Friedman and Brownell, 1995). These have been accompanied by research examining depression, (Erickson *et al*., 2000), psychiatric disorders, (Lamertz *et al*., 2002; Mustillo *et al*., 2003), and quality of life (Schwimmer *et al*., 2003; Williams *et al*., 2005). However, as with biomedical risk, the psychological distress associated with childhood obesity shows variations within and between studies. Any deficit in low self-esteem, for example, depends on children's sex, age, degree of obesity, and whether they are drawn from clinical or community samples (French *et al*., 1995).

Aim of the study

The present study aimed to determine psychiatric disorders that are comorbid with pediatric obesity, comparing boys and girls for these disorders, and suggesting areas for future study.

Methods

Ethical considerations

The approval of the ethical and research committees of the Department of Psychiatry Kasr EL Aini Hospital was obtained in accordance with the provisions of the World

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Medical Association's Declaration of Helsinki. The consent of the participants was taken after describing the steps of assessment. Informed consent to the study procedure was signed by the parents of the children.

Study design

This is a descriptive cross-sectional outpatient study.

Study population

The study sample included 52 overweight youngsters (26 girls and 26 boys) who presented to the endocrinology clinic in the Abo-elrish pediatric hospital with increased body weight. The endocrinal profile indicated no abnormality and it was established as constitutional obesity. The male group had a mean age of 9.77 years (SD = 2.46; range 5–13) and a mean intelligence quotient (IQ) of 89.62 (SD = 11.08; range 65–100). The female group had a mean age of 9.54 (SD = 1.75; range 6–12) and a mean (IQ) of 91.38 (SD = 6.46; range 77–99). Both the groups were matched in terms of the educational level.

Study tools

(1) *Weight and height were measured*: The BMI was calculated and then matched to the (CDC) charts and was found to be in the range from the 85th to less than the 95th percentile.
(2) *Wechsler Intelligence Scale for Children* (*Weiss et al., 1993*): Measures the child's IQ, general abilities, attention, and speech development.
(3) *The Anxiety Scale for Children* (*El-Beblawy, 1987*): A 42-question scale measuring a child's anxiety manifestations (score < 18 normal, 19–28 moderate anxiety, and >29 high anxiety). The manifest behavior, for example avoidance of specific situations, physiological responses to anxiety, and verbalization of anxiety experience.
(4) *The Depression Scale for Children* (*Abd El-fattah, 1995*): A 27-Question Scale covering the child's depression symptoms such as depression, pessimism, worthlessness, anhedonia, anxiety, helplessness, weeping, suicidal ideation, low frustration tolerance, social isolation, loss of interest, hesitancy, low self-esteem, low motivation, somatic symptoms, poor school achievement and peer relation, and behavioral disturbances (score > 50 has significant depression).
(5) *The Self-Concept Scale* (*El-Ashwal, 1984*): An 80-question scale covering four domains of self-concept: mental and academic abilities, body image, social abilities and peer relation, adaptation, feelings of anxiety, and depression or satisfaction (< 46 low self-concept, >46 positive self-concept).
(6) *Eating disorder test* (*Shokaire, 2000*): It is a 40-question subjective test to assess eating-related behavior. The questions are answered by the following responses: agree (2 marks), to some extent (1 mark), or do not agree (0 mark). It assesses different eating disorder-related aspects such as eating behavior, weight, and body shape. A score equal to or above 20 marks is considered to indicate an eating disorder.
(7) *Behavioral Checklist for Children* (*Achenbach, 1991*): It consists of nine subscales, measuring variable behavioral disorders in children: withdrawal scale, somatic complaints scale, anxiety/depression scale, social problems scale, thought problems scale, attention problems scale, delinquency scale, aggression scale, and sexual problems scale. Note: In all the previous tools, validity and reliability were established, and they were also adapted for use in Egyptian children and were carried out in Arabic language (scores $T > 70$ were significant).

Statistical analysis

Data were statistically described in terms of mean ± SD, median and range, or frequencies (number of cases) and percentages when appropriate. Comparison of numerical variables between the study groups was carried out using the Mann–Whitney *U*-test for independent samples. For comparing categorical data, the χ^2-test was performed. The exact test was used when the expected frequency was less than 5. *P* values less than 0.05 were considered statistically significant. All statistical calculations were carried out using computer program statistical package for the social science, version 15 for Microsoft Windows (SPSS Inc., Chicago, Illinois, USA).

Results

The educational stages of the children are presented in (Table 1), which shows that 48 (92.3%) of the total 52 children were educated. They were in kindergarten, primary, and preparatory stages. Eight (15.4%) were depressed, 16 (30.8%) were moderately anxious, and 10 (19.2%) were highly anxious (Table 1). Twenty-four (46.2%) of the children had a low self-concept and 28 (53.8%) had a positive self-concept (Table 4). All children had an eating disorder (Table 1). From the items of the child checklist, no child showed delinquency or sex preference problems (Table 2). Comparative results between boys and girls showed that all girls were in the primary stage, whereas the boys were distributed throughout the stages (Table 3). Four (15.4%) boys and

Table 1 Educational stages, depression, anxiety, self-concept, and eating disorder

	N (%)
Education stage	
Kindergarten	2 (4.2)
Primary	44 (91.7)
Preparatory	2 (4.2)
Depression	
Depressed	8 (15.4)
Not depressed	44 (84.6)
Anxiety	
No anxiety	26 (50)
Moderate anxiety	16 (30.8)
High anxiety	10 (19.2)
Self-concept	
Low self-concept	24 (46.2)
Positive self-concept	28 (53.8)
Eating disorder	
Eating disorder	52 (100)
No eating disorder	0 (0)

Table 2 Results of the behavioral check list for children

	N (%)	
	Negative	Positive
Withdrawal	36 (69)	16 (30.8)
Somatic	44 (84.6)	8 (15.4)
Anxiety/depression	40 (76.9)	12 (23.1)
Social	48 (92.3)	4 (7.7)
Thought	48 (92.3)	4 (7.7)
Attention	50 (96.2)	2 (3.8)
Delinquency	52 (100)	0 (0)
Aggression	50 (96.2)	2 (3.8)
Sex preference	52 (100))	0 (0)

Table 3 Descriptive results of values

	N	Minimum	Maximum	Mean	SD
Age	52	5.42	13.8	9.7	2.12
IQ	52	65	100	90.5	9.02
Depression	52	1	54	27.96	18.8
Anxiety	52	6	61	24.6	17.2
Self-concept	52	29	76	50.1	14.4
Eating	52	27	47	36.7	5.11
Withdrawn	52	58	82	67.4	7.4
Somatic complaints	52	54	72	65.2	4.8
Anxiety/depression	52	52	83	64.04	9.7
Social problems	52	52	73	63.3	4.7
Thought problems	52	50	79	55.4	8.01
Attention problems	52	51	81	60.1	6.8
Delinquent	52	54	67	58.5	4.7
Aggression	52	50	73	62	5.97
Sex preference	52	50	65	50.6	2.91

IQ, intelligence quotient.

girls were depressed (Table 6). Half of the boys were not anxious, 10 (38.5) of the other half were moderately anxious, and four (15.4%) of them were highly anxious. Six (23.1%) girls had moderate anxiety and another six were highly anxious. Sixteen (61.5%) girls had a low self-concept whereas only eight (30.8%) boys had a low self-concept with a statistical significance ($P = 0.050$) (Table 3). All boys and girls had an eating disorder (Table 3). Eight (30.8%) boys and girls had a withdrawal problem (Table 4). The majority of both boys and girls had no somatic symptoms (Table 3). Eight (30.8%) of the boys scored as anxiety/depressed compared with only four (15.4%) girls (Table 4). Twenty-four (92.3%) boys and girls sample showed no social problems (Table 5). None of the girls showed attention problems, compared with only two (7.7%) of the boys (Table 6). None of the boys or girls showed delinquency (Table 6). None of the girls showed aggression, whereas two (7.7%) boys showed aggression (Table 6). None of the boys or girls showed sex preference problems (Table 6).

Discussion

Low self-concept was found to be significantly higher in girls than in boys, and this can be explained by the fact that girls perceive higher levels of social and media pressure to lose weight as pursuing a better body shape. Boys, however, perceived social and media pressure to be muscular and they preferred a larger body size for a better body shape. This was consistent with the findings of Pallan *et al.* (2011), which found a low self-concept (over 80%) and a significant relationship between objectively measured weight status and low self-concept

Table 4 Comparison between boys and girls of different variables

	N (%)			
	Boys	Girls	Total	*P*
Education stage				
Kindergarten	2 (9.1)	0 (0)	2 (9.1)	0.076
Primary	18 (81.8)	26 (100)	44 (91.7)	
Preparatory	2 (9.1)	0 (0)	2 (9.1)	
Depression				
Not depressed	22 (84.6)	22 (84.6)	44 (84.6)	1.000
Depressed	4 (15.4)	4 (15.4)	8 (15.4)	
Anxiety				
No anxiety	12 (46.2)	14 (53.8)	26 (50)	0.46
Moderate anxiety	10 (38.5)	6 (23.1)	16 (30)	
High anxiety	4 (15.4)	6 (23.1)	10 (19.2)	
Self-concept				
Low self-concept	8 (30.8)	16 (61.5)	24 (46.2)	0.050*
Positive self-concept	18 (69.2)	10 (38.5)	28 (53.8)	
Eating problems				
Eating disorder	26 (100)	26 (100)	52 (100)	1.000
No eating disorder	0 (0)	0 (0)	0 (0)	
Social withdrawal				
No withdrawal	18 (69.2)	18 (69.2)	36 (69.2)	1.000
Withdrawal	8 (30.8)	8 (30.8)	16 (30.8)	
Somatic complaints				
No somatic symptoms	20 (76.9)	24 (92.3)	44 (84.6)	0.248
Somatic symptoms	6 (23.1)	2 (7.7)	8 (15.4)	
Anxiety/depression				
No anxiety/depression	18 (69.2)	22 (84.6)	40 (76.9)	0.324
Anxiety/depression	8 (30.8)	4 (15.4)	12 (23.1)	
Social problems				
Negative	24 (92.3)	24 (92.3)	48 (92.3)	1.000
Positive	2 (7.7)	2 (7.7)	4 (7.7)	
Thought problems				
Negative	24 (92.3)	24 (92.3)	48 (92.3)	1.000
Positive	2 (7.7)	2 (7.7)	4 (7.7)	
Attention problems				
Negative	24 (92.3)	26 (100)	50 (96.2)	0.49
Positive	2 (7.7)	0 (0)	2 (3.8)	
Delinquent				
Nondelinquent	26 (100)	26 (100)	52 (100)	1.000
Delinquent	0 (0)	0 (0)	0 (0)	
Aggression				
No aggression	24 (92.3)	26 (100)	50 (96.2)	0.49
Aggression	2 (7.7)	0 (0)	2 (3.8)	
Sex preference problems				
Negative	26 (100)	26 (100)	52 (100)	1.000
Positive	0 (0)	0 (0)	0 (0)	

*Significant (<0.05).

Table 5 Comparison between boys and girls in clinical and psychopathological correlates

	Age	IQ	Depression	Anxiety	Self-concept	Eating
Boys (*N*=26)						
Mean	9.8	89.6	24.9	23.8	57.2	37
SD	2.5	11.1	19.99	17.4	14.3	5.7
Minimum	5.4	65	1	6	37	27
Maximum	13.8	100	54	61	76	47
Median	10.8	92	18	24	61	36
Girls (*N*=26)						
Mean	9.5	91.4	31	25.5	43	36.5
SD	1.8	6.5	17.4	17.4	10.9	4.48
Minimum	6.67	77	3	11	29	29
Maximum	12.58	99	54	61	63	47
Median	9.75	93	32	17	39	35
P	0.58	0.8	0.2	0.66	0.001	0.77

IQ, intelligence quotient.

Table 6 Comparison between boys and girls in terms of the Behavioural Checklist for Children

	Withdrawn	Somatic	Anxiety/depression	Social	Thought	Attention	Delinquent	Aggression	Sex preference
Boys (*N*=26)									
Mean	67.1	64.6	64.9	62.8	54.6	60.5	58.1	62.3	51.2
N	26	26	26	26	26	26	26	26	26
SD	8.4	5.2	11.02	5.1	8.7	7.96	5.2	6.9	4.1
Minimum	58	54	52	52	50	51	54	50	50
Maximum	82	72	83	73	79	81	67	73	65
Median	64	64	61	64	50	61	57	64	50
Girls (*N*=26)									
Mean	67.7	65.7	63.2	63.8	56.2	59.69	58.9	61.7	50
N	26	26	26	26	26	26	26	26	26
SD	6.4	4.32	8.4	4.39	7.3	5.6	4.2	5.1	0.000
Minimum	58	56	52	54	50	51	54	52	50
Maximum	82	72	82	73	73	67	67	69	50
Median	67	66	64	64	57	61	58	63	50
P	0.44	0.28	0.83	0.55	0.14	1.000	0.15	0.46	0.15

body image perception and body dissatisfaction in children as young as 5. The findings of the present study were consistent with those of Button *et al*. (1997), Nassar *et al*. (1992), Franklin *et al*. (2006), and Ricciardelli and McCabe (2001), in which girls with lower levels of self-concept and self-esteem had higher levels of body dissatisfaction and were more likely to engage in strategies to decrease weight. In this study, only 15.4% were depressed without sex difference and this could be explained by the differences in how depression is diagnosed in children compared with adults with atypical symptomatology, irritability, cognitive dysfunction, externalizing behavioral patterns, social isolation, and low self-esteem and self-concept. Our findings are in agreement with those of Wardle and Cooke (2005), which found that symptoms of depression and guilt were found more frequently along with externalizing behavior problems in children compared with adolescents, whereas Reeves *et al*. (2008) reported that the core feature of depression is decreased interest and motivation for activity. Exclusive pursuit of sedentary activities promotes social isolation as well as decreased physical activity. Interpersonal problems and feelings of ineffectiveness on the Children's Depression Inventory correlated with sedentary behavior at the ages of 11–13 years (Anton *et al*., 2006). Consistent with this study is that of Place *et al*. (2002), which attributed the absence of psychopathology in some children to the strong resilience they show so that they have access to protective or mediating factors in three broad areas: within themselves, in their families, and within the communities in which they live, where obesity can be considered as a sign of health. Thirty percent of the study sample was found to have moderate anxiety and 19.2% were found to have high anxiety, with no significant difference between boys and girls. Consistent with our finding French *et al*. (1995) and Warschburger (2000) reported that the clinical impression indicates that obese children might experience increased anxiety in association with obesity. However, this clinical observation did not always coincide with the results of studies. The magnitude of the association between weight status and the occurrence of psychological problems varies and suggests that obesity does not inevitably lead to psychosocial strain. The present study indicated that 100% of the patients had an eating disorder. This finding was expected and can be attributed to different factors, the heritability of eating disorders, learned behavior pattern, depressive states, and stress. Clare *et al*. (2011) have reported that psychological, social, and behavioral processes play a role in the development of eating behaviors during infancy and childhood, and they described the five feeding styles of eating behavior in childhood: (a) restriction of particular kinds of (unhealthy) foods or amounts of food; (b) pressure or excessive encouragement to consume more food, especially during a meal; (c) instrumental feeding – using food as a reward to manipulate behavior; (d) emotional feeding – using food to manage the child's negative emotional states; and (e) exposure – children eat what their parents give them, and may copy their parents' eating behaviors. Motivation to eat is a relative reinforcing value of food, whereas the prevalence of youth with a high motivation to eat is currently unknown; this appetitive trait has been detected in 8-year-old children (Temple *et al*., 2008). One promising substitute for food may be increased social support and social interactions with family and peers (Wilfley *et al*., 2007, 2010), as overweight youngsters have been found to make healthier eating and activity choices when they are in the presence of peers as compared with when they are alone (Salvy *et al*., 2007, 2008). This indicates that maladaptive eating behavior can be a result of negative affect and social unacceptance and isolation. Impulsivity is typically measured in youth with weight-related problems through a delay in the gratification paradigm in a laboratory setting, whereby children choose between a smaller, immediate food reward and a larger, delayed reward (Mischel *et al*., 1989). Reward sensitivity has been found to be a key aspect of impulsivity in obesity (Stice *et al*., 2002). All of the appetitive traits are similar in that such individuals have an impaired ability to regulate their energy intake; these vulnerable youth are unable to initiate eating only when they are hungry and/or terminate eating when they are full. This observation may indicate a common propensity for children and adolescent with appetitive traits to rely on external influences to determine food intake. Studies show an overlap among appetitive traits in overweight children and adolescents, including between binge eating and satiety responsiveness (Mirch *et al*., 2006), binge eating and impulsivity (Nederkoorn *et al*., 2006, 2007), and motivation to eat and

impulsivity (Epstein *et al.*, 2010). In the present study, none of the girls showed attention problems, compared with only two (7.7%) boys. This could be attributed to the lower motivation to perform, because of low self-esteem and higher impulsivity and aggressive traits in boys than girls. The findings of Braet *et al.* (2007) are consistent with ours in that especially overweight boys show more impulsivity, hyperactivity, and attention deficits, as well as problems with focusing attention on the attention control scale compared with their normal-weight controls. In the present study, 7.7% were found to have social problems without sex difference. This low rate of social problems might be attributed to the family and social support. One promising substitute for food may be increased social support and social interactions with family and peers (Wilfley *et al.*, 2007, 2010), as overweight youngsters have been found to make healthier eating and activity choices when they are in the presence of peers as compared with when they are alone (Salvy *et al.*, 2007, 2008). This indicates that maladaptive eating behavior can be a result of negative affect and social unacceptance and isolation. This study indicated that none of the girls showed aggression. This low rate of aggression can be explained by the possibility that overweight children seek social acceptance more than fighting back. Our small sample size might represent another explanation. They are likely victims of verbal taunting and teasing. Negative comments about the child needing to lose weight for peer acceptance were frequent. In studies by Epstein *et al.* (1994); Zeller *et al.* (2004), it was found in both clinical and nonclinical samples of obese youth that mother-reported externalizing or aggressive symptoms were in the nonclinical range, although at rates higher than those of non-treatment-seeking obese and/or nonobese age mates (Tershakovec *et al.*, 1994; Braet *et al.*, 1997; Young-Hyman *et al.*, 2003; Erermis *et al.*, 2004; Tanofsky-Kraff *et al.*, 2004). Boys were more likely to suggest a more aggressive response, such as 'he should fight back' than the girls, with girls being more likely to suggest talking about the name-calling. This was consistent with previous research showing that girls are more positive about overweight peers (Cohen *et al.*, 1997) and about peers in general compared with boys (Nabors *et al.*, 2004). In this study, the majority of both boys and girls in the sample had no somatic symptoms. The absence of somatic symptoms as a part of other psychiatric comorbidities that were also absent in our study, especially depression and anxiety, could have been compensated for by other symptoms such as a low self-concept and eating disorders. The young age range and the small size may explain the finding. Consistent with our findings is a study of adolescent girls by Pesa *et al.* (2000), which found that after controlling for body-image dissatisfaction, the difference in somatoform, pain, and other psychopathology between nonobese and obese girls aged 15–17 years was insignificant. Erickson *et al.* (2000) found similar results in a study of third graders. Thus, obese children may overeat as a consequence of environmental deprivation or as a result of depression, somatization, or familial abuse (Christoffel and Forsyth, 1989; Felitti, 1993).

Limitations

The first limitation is that this is a cross-sectional study that assessed a group of overweight children and not a longitudinal study that shows different phases and relationships with psychiatric symptoms such as anxiety, depression, and self-esteem and self-concept. The second limitation is the absence of assessments of character and temperament to exclude the overlap of symptoms such as borderline traits that could have been present.

Clinical implications

Overweight during childhood is widespread and associated with harmful physical, psychological, and social problems. Therefore, it is important for health providers to be aware of the causes and consequences of eating-related and weight-related problems, considering sex differences as an important factor in the understanding of the psychopathology of overweight children.

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Conflicts of interest

There are no conflicts of interest.

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