

## المخلص

**دراسة السمنة في عينة من الاطفال المصريين المصابين بفرط الحركة ونقص الانتباه**

يعد مرض اضطراب فرط الحركة ونقص الانتباه من أمراض العصر واسعة الانتشار، الأمر الذى جعله محط اهتمام صحى عالمى واسع النطاق، خاصة فى ظل توارد بعض المؤشرات الإحصائية الدولية التى تشير إلى ارتفاع عدد الإصابة بهذا المرض .

ومن واقع الإحصاءات، يتبين أنه يصاب من ثلاثة إلى خمسة بالمئة من طلاب المدارس بهذه الحالة، وأن الذكور أكثر إصابة من الإناث. من ناحية أخرى، وجدت الدراسات أن هناك علاقة بين ارتفاع نسبة الإصابة بالسمنة والإصابة بمرض اضطراب فرط الحركة ونقص الانتباه .

تمت الدراسة على ٣٠ مصاب بمرض اضطراب فرط الحركة ونقص الانتباه، ٢٦ ذكر و٤ اناث، وجد ان نسبة الاطفال دون ١٢ سنة هي الاكثر في الدراسة وان اغلبية الحالات يعانون من فرط الحركة بشكل اساسى.

وقد تم دراسة الحالات محل البحث فى العيادات الخارجية فى مركز ذوى الاحتياجات الخاصة، بمعهد الدراسات العليا للطفولة بجامعة عين شمس. تم تشخيص جميع الحالات طبقا لمعايير الرابطة الأمريكية للطب النفسى، وقد تراوحت أعمار المرضى من الأطفال والمراهقين محل البحث بين ٦ سنوات و١٨ سنة ومتوسط العمر ٣,٣١±١٠,١٧ سنوات. ويمثل المرضى الذكور ضمن هذه العينة (٨٧%)، بينما يمثل الإناث (١٣%). وكان هناك (٤٦,٧%) من المرضى يعانون من السمنة المفرطة و(٥٣,٣%) من غير البدناء. كما كان هناك (٥٠%) من المرضى تحت العلاج مثل أدوية(المنشطات النفسية، الأدوية المضادة للاكتئاب، والمقويات).

فى هذا العمل وجد انه لا يوجد فارق كبير بين الحالات المرضية والحالات الضابطة فيما يتعلق بمعدل كتلة الجسم كما أننا لم نتوصل لاثبات أن هناك علاقة بين ارتفاع نسبة الإصابة بالسمنة والإصابة بمرض اضطراب فرط الحركة ونقص الانتباه.

- controversial diagnosis? **Irish Journal of Medicine**, (2002) 19,86-91.
20. Kirschenbaum D, and Fitzgibbon M: Controversy about the treatment of obesity Criticisms of challenges? **Behaviour Therapy**, (1995) 26, 43-68.
  21. Lam LT, Yang L: Overweight/obesity and attention deficit and
  22. hyperactivity disorder tendency among adolescents in China. **International Journal of Obesity** (2007); 31: 584-590.
  23. Mannuzza S, Klein RG, Moulton JL 3rd: Persistence of Attention-Deficit/Hyperactivity Disorder into adulthood: what have we learned from the prospective follow-up studies? **J Atten Disord** (2003), 7:93-100.
  24. Mikami A, and Hinshaw S: Resilient adolescent adjustment among girls: Buffers of childhood peer rejection and Attention-Deficit/Hyperactivity Disorder. **Journal of Abnormal Child Psychology**, (2006) 34, 825-839.
  25. (NCHS) National Center for Health & Statistics: **CDC Growth Charts**. US Department of Health & Human Services 2000.
  26. Perrin JM, Brown RT, Amler RW, Freeman WS, Stein MT, Feldman HM, Pierce K, Wolraich ML; Treatment of attention-deficit/hyperactivity disorder: overview of the evidence. American; American Academy of Pediatrics Subcommittee on Attention-Deficit/Hyperactivity Disorder. **Pediatrics**. 2005 Jun;115 (6): e749-57.
  27. Polanczyk G, de Lima MS, Horta BL, Biederman J, Rohde LA: The worldwide prevalence of ADHD: a systematic review and metaregression analysis. **Am J Psychiatry** (2007) 164:942-8.
  28. Rodriguez A, Miettunen J, Henriksen T B, Olsen J, Obel C, Taanila A, Ebeling H, Linnet K,: Maternal adiposity prior to pregnancy is associated with ADHD symptoms in offspring: evidence from three prospective pregnancy cohorts In **International Journal of Obesity** (2008) 32, 550-557.
  29. Shields, M: Statistics Canada: Measured Obesity: Overweight Canadian children and adolescents. Nutrition: Findings from the **Canadian Community Health Survey**. Issue no 1(2005).
  30. Smith, Megan Dorothy, M.A: Relationship between impulsivity in ADHD and body weight (2008) from [http://gradworks.umi.com/cgi-bin/redirect?url=http://gateway.proquest.com/openurl%3furl\\_ver=Z39.88-2004%26res\\_dat=xri:pqdiss%26rft\\_val\\_fmt=info:ofi/fmt:kev:mtx:dissertation%26rft\\_dat=xri:pqdiss:MR45049](http://gradworks.umi.com/cgi-bin/redirect?url=http://gateway.proquest.com/openurl%3furl_ver=Z39.88-2004%26res_dat=xri:pqdiss%26rft_val_fmt=info:ofi/fmt:kev:mtx:dissertation%26rft_dat=xri:pqdiss:MR45049)
  31. Taylor DM, Askil R: Atypical antipsychotics and weight gain—a systematic review. **Acta Psychiatr Scand**(2000); 101:416-432.
  32. WHO: World Health Organization (2003). Obesity and Overweight. Global Strategy on Diet, **Physical Activity and Health**. Retrieved August.(2008). from <http://www.who.int/hpr/NPH/docs/gsobesity.pdf>

2. (APA.,1994) American Psychiatric Association: **Diagnostic and Statistical Manual of Mental Disorders**, (1994) 4th edition. Washington, D.C.
3. (APA.,2000) American Psychiatric Association: **Diagnostic and Statistical Manual of Mental Disorders**, (2000)4th edition., Text Revision.. Washington, DC.
4. Barkley R: Developmental course and adult outcome. In: Attention deficit hyperactivity disorder. **A handbook for diagnosis and treatment**, (1990) 114-129.
5. Baumeister H, Harter M: Mental disorders in patients with obesity in comparison with healthy probands. **Int J Obes** (2007); 31: 1155-1164.
6. Biederman J, Faraone S, Spencer T, Wilens T, Mick E & Lapey K: Gender differences in a sample of adults with ADHD, **Psychiatry Research**, 53 (1) 13-29. (1994)
7. Biederman J, Faraone S, Milberger S, Guite J, Mick E, Chen L, Mennin D, Marris A, QuelletT, Kraus I, & Perrin J:A prospective 4-year follow-up study of Attention-Deficit Hyperactivity and related disorders. **Archives of General Psychiatry** (1996) 53, 437-446.
8. Biederman J, Mick E, Faraone SV: Age-dependent decline of symptoms of attention deficit hyperactivity disorder: impact or remission definition and symptoms type. **Am Psychiatry** (2000), 157:816-818.
9. Biederman J, Faraone SV: The Massachusetts General Hospital studies of gender influences on attention-deficit/hyperactivity disorder in youth and relatives. **Psychiatr Clin North Am** (2004) Jun;27(2):225-32.
10. Braet C, Claus L, Verbeken S, Vlierberghe L: Impulsivity in overweight children. **European Child and Adolescent Psychiatry**, (2007). 16, 473-483.
11. CDC:Centers for Disease Control. National Health and Nutrition
12. Examination Survey (NHANES) 1999-2002 [http:// www.cdc.gov/nchs/nhanes.htm]
13. Cortese S, Isnard P, Frelut M, Michel G, Quantin L, Guedeney A, Falissard B, Acquaviva E, Bernardina B, & Mouren M.: Association between symptoms of attention-deficit/hyperactivity disorder and bulimic behaviors in a clinical sample of severely obese adolescents. **International Journal of Obesity**, (2006). 1-7.
14. Davis C, Levitan R, Smith M, Tweed S, & Curtis C.: Associations among overeating, overweight, and Attention-Deficit/Hyperactivity Disorder: A structural equation modeling approach. **Eating Behaviors** (2006), 7, 266-274.
15. El-Bouhy Fs:Tool For **Socioeconomic levels.Aly SI ed. Educational Year Book**. Egyptian association for Graduate of College of Education,(1988),434-43.
16. Faraone SV, Biederman J, Mick E, et al: Family study of girls with attention deficit hyperactivity disorder. **Am J Psychiatry**. (2000); 157 (7):1077-1083.
17. Holtkamp K, Konrad K, Muller B, Heussen N, Herpertz S, Herpertz-Dahlmann B, & Hebebrand J: Overweight and obesity in children with Attention- Deficit/Hyperactivity Disorder. **International Journal of Obesity** (2004)., 28, 685-689.
18. Hubel R, Jass J, Marcus A & Laessle R: Overweight and basal metabolic rate in boys with Attention-Deficit/Hyperactivity Disorder. **Eating and Weight Disorders** (2006)., 11, 139-146.
19. Kirley A, and Fitzgerald M:Adult ADHD: A

Table:4 Person's correlation coefficients (r) between body mass index (BMI) and different parameters.

Variable \ BMI	P- Value
Age	.418
Sex	.368
Socioeconomic Level	.465
Treatment	1.000

This table shows there is no significant correlation, body mass index (BMI), and age, sex, administration of treatment and socioeconomic level in ADHD patients.

**Discussion:**

Attention Deficit hyperactive Disorder (ADHD) is a chronic early-onset syndrome of developmentally inappropriate levels of inattention, hyperactivity, and impulsivity. Male to female ratio among studied cases with ADHD all over the world as (APA.,1994) was 4:1. However, (Mannuzza., et al 2003) found that male to female ratio was 3:1.

Moreover, (Faraone., et al 2000), explained that gender difference is due to the girls usually presented in an attentive form of the disorder more frequent than hyperactivity, so they are under detected and remained silent cases. This is consistent with our study, where male cases showed a predominant presentation 26 cases compared to 4 cases females, this could explain the frequent presentation of hyperactive type in our sample 56.7%, while in attentive type was present in 16.6% and combined type in 26.7%.

Overweight and obesity seem to be more prevalent among persons with mental disorder and children with ADHD symptoms) Baumeister and Harter.,2007). Recently, researchers have also begun to identify a link between ADHD and overweight and obesity (Cortese., et al 2006; Holtkamp., et al 2004; Hubel., et al 2006). In a large population study of 1429 high school students in China, they found that there was a significant relationship between

ADHD and obesity, but not between ADHD and being overweight (Lam and Yang., 2007). In our study the obese patients were 46.7%, while the obese controls were 33.3%, and this inconsistency with previous study could be explained by correlating to socio-economic status of our sample, as that majority of cases were from low and middle socioeconomic class of society, where income plays a major role in determining the nature of food content. However our results were somewhat consistent with (Smith.,2008) who found that, there is no association between ADHD and obesity/overweight in his clinical sample.

Previous studies gave no conclusive results concerning relation of medication of ADHD and over-weight and obesity, Holtkamp et al.,2004 found there were no significant differences between those ADHD patients who were on medication, and those who were not as regards their weight. Also Perrin.,et al 2005 found ADHD children who were medicated were significantly less likely to be overweight than those who were not, however (Taylor and Askill.,2000) reported that children and adolescence with ADHD are more likely to be overweight when not medicated, moreover ADHD children who are medicated are more likely to be underweight. In our study we found that there is no significant correlation between BMI and administration of treatment.

**Conclusion:**

We concluded from our results that there is no correlation between ADHD patients and obesity which may be due to limitation of our study, small number of our sample, and interference of medications.

**References:**

1. Altfas, J. Prevalence of Attention Deficit/Hyperactivity Disorder among adults in obesity treatment. *BMC Psychiatry*, 2 (2002).

against Standard Egyptian Percentile Curves for BMI of patients.

**Results:**

The sample of our study was divided according to age into children (6-12) and adolescent (12-18), and children predominance was found as 21 child were in the study compared to 9 adolescent, comparing children with adolescent group regarding gender, obesity and subtype of ADHD showed no significant difference. When our estimates are compared to an age-matched controls, children with ADHD have a prevalence of overweight that did not differ from children in control group, also did not differ significantly between boys and girls.

Table 1: Comparison between cases and control groups regarding age, sex, obesity and socioeconomic leveling distribution.

Variable		Sample	Cases	Control	P-Value
Age	Children(6-12)		21	22	0.502
	Adolescences (13-18)		9	8	
Sex	Males		26	25	0.347
	Females		4	5	
Socioeconomic Level	High		2	2	0.253
	Middle		16	17	
	Low		12	11	

\*Significant

The table shows that there was no significant difference between cases and controls regarding to sex, age and socio-demographic status.

Table 2: Comparison between cases and control groups regarding obesity.

Variable		Sample	Cases	Control	P-Value
Obesity	Obese		14	10	0.393
	Non Obese		16	20	

This table shows that there is no significant difference between cases and controls as regards obesity.

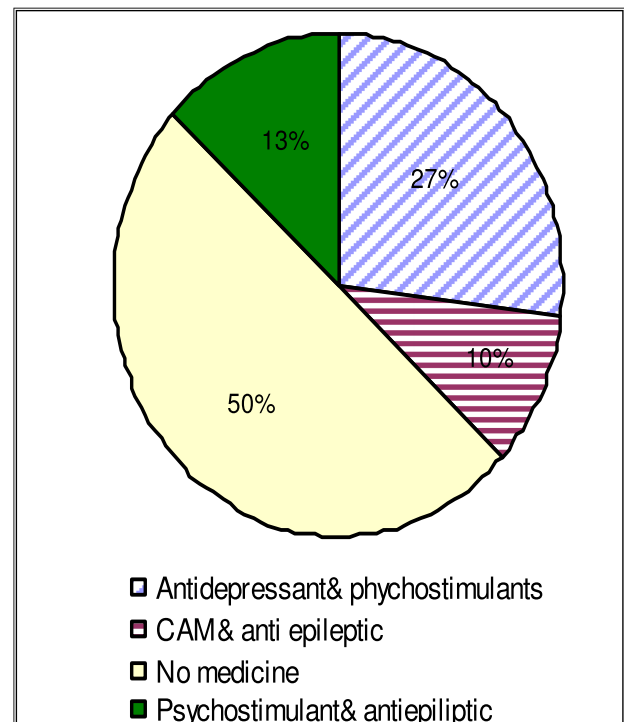
Table:3 Comparison between males and females ADHD patient with according to, age, developmental history, obesity and types of ADHD

Variable		Sample	Males	Females	P-Value
Age	Children (6-12)		18	3	0.815
	Adolescences (13-18)		8	1	
Obesity	Obese		13	1	0.351
	Non Obese		13	3	
Types Of ADHD	Predominantly Inattentive(ADD)		4	1	0.428
	Predominantly hyperactive impulsive (ADHD)		14	3	
	Combined		8	0	

This table shows that there is no significant difference between males and females in ADHD patients as regards age, obesity and types of ADHD.

Figure 1: Frequency of types of treatment in ADHD patients:

In our sample fifty percent of cases were on



medications (13% treated with psychostimulant and antiepileptic, 27% treated with antidepressant and psychostimulant and 10% treated antiepileptic and complementary alternative medication) and remaining 50% were medication free.

symptom logy and BMI.

Braet.,et al 2007, studied 109 overweight children between the ages of 10 and 18 years, who were entering treatment in a pediatric clinic, and found that overweight patients were more impulsive compared to a control group of children selected from the general population. Furthermore, overweight males reported having more problems with attention than controls, and both overweight males and females reported having more difficulty shifting their attention. (Cortese ,et al 2006) examined 99 severely obese adolescents between the ages of 12 and 17 years, and found that there was a significant relationship between bulimic behaviours and ADHD, after controlling for symptoms of anxiety and depression.

Moreover (Rodriguez., et al 2008) studied that pre-pregnancy BMI is associated with ADHD symptoms in offspring children.

**Subjects And Method:**

Thirty ADHD children and adolescents patients fulfilling the criteria for the diagnosis of ADHD according to DSM-IV TR diagnostic criteria for research (APA., 2000) recruited for the study from Out patients Clinic in Special Needs Center of Postgraduate Childhood Studies, Ain-Shams University. Along with 30 healthy age and sex-matched children and adolescents serving as controls.

⊠ Inclusion criteria for patient group:

1. Children meeting the criteria for the diagnosis of ADHD according to DSM-IV TR diagnostic criteria for research (APA.,2000).
2. Children aged between 6 and 18 years.
3. Children who have BMI at or above the 95th percentile for the age and sex, and others with normal centile range.
4. Both sexes are included.

⊠ Exclusion criteria for both groups:

1. Patients or mothers with endocrinal diseases as (cushing's syndrome, diabetes or hypo thyroidism).
2. Patients on steroid or other hormonal therapy.

**Methods:**

All children included in this study were subjected to full medical history, laying stress on name, age, sex, consanguinity, developmental history and socioeconomic status leveling according to (El-Bouhy.,1988) which was assessed by data about father education and occupation, mother education and occupation and family income.

Full clinical examination followed by Anthropometric measures including:

1. Weight assessment (Kg): This was assessed using kilogram weighing balance ranging from 1-140 Kg, while the patient stood with light clothes and bare footed, weight was recorded to the nearest 0.5 Kg.
2. Standing height assessment (Cm): All patients assessed without shoes, the measuring was taken while patient in standing position against a firm wall with a fixed stadiometer, the heels together stretched upward to full extend, and the back straight as possible, and the head in horizontal Frankfurt position (imaginary line passing by the middle of the ear tragus and lower edge of eye globe). Measurements was taken to nearest 0.5 Cm.
3. Body Mass Index (BMI) calculation: BMI was calculated from the previous weight and height measurements using that equation:  
$$\text{Body weight(Kg)}/\text{standing height(m)}^2$$
4. According the Official Center for Disease Control growth charts (CDC,2 000), created by National Center for Health Statistics(NCHS): BMI value of cases and controls were plotted

**obesity and others found that, there is no association between ADHD and obesity/overweight. In our work we can not prove the link between ADHD and obesity due limitation of our study, small number of our sample, and interference of medications.**

**Obesity in an Egyptian Sample of Attention Deficit Hyperactivity Disorder Children.**

**Introduction:**

There are three subtypes of ADHD, including predominantly hyperactive/ impulsive, predominantly inattentive, and combined subtype (Biederman, et al 1994). Although the overt symptoms of ADHD tend to decline with age, symptoms often persist into adolescence and adulthood. For instance, (Biederman, et al 2000) found that up to 70% of children with ADHD will continue to experience significant impairment in adulthood. Furthermore, it is interesting to note that the gender ratios for ADHD change over time. According the DSM-IV-TR (APA., 2000), in childhood the male to female ratio is approximately 2: 1 to 9: 1, depending on the subtype (less discrepancy with the inattentive subtype) and setting (more males are seen in clinical settings). Research has shown, however, that by adulthood, the ratio of males to females is much more balanced (Biederman and Faraone., 2004). Adolescents with ADHD have a high rate of comorbidity, including problems with conduct, mood, anxiety disorders (Barkley., 1990; Biederman., et al 1996), and eating disorders (Mikami & Hinshaw., 2006).

Obesity has become increasingly common in recent years, and now it is considered as an epidemic by the World Health Organization (WHO., 2003). The WHO uses Body Mass Index (BMI) to classify weight according to the formula  $\text{weight}/\text{height}^2$  ( $\text{BMHcg}/\text{m}^2$ ), such that a BMI between 24,99 and 29,99 is "overweight", and a BMI over 30 is considered "obese". A BMI over 25 places people at a

greater risk of developing a variety of potentially life-threatening diseases, including various types of cancers, diabetes, and cardiovascular disease, and places a great strain on healthcare resources in many countries (WHO., 2003). According to Statistics Canada (Shields., 2005), overweight and obesity in Canadian children and adolescents is on the rise. In 1979, 12% of 2 to 17 year olds were overweight, while 3% were obese, but by 2004, these numbers had risen to 18% and 8% respectively. Overall, the national rate of overweight and obesity is 26%.

Both ADHD and obesity have garnered a great deal of attention by researchers, and there has been considerable debate regarding the proposed causes of each (Kirley & Fitzgerald., 2002; Kirschenbaum & Fitzgibbon.,1995). It is only recently, however, that researchers have begun to examine the possible link between the two. Three types of approaches have been used to investigate this purported link: a) population surveys that have examined the overlap between ADHD and overweight/obesity; b) studies that have looked at the rate of ADHD in overweight/obese populations and c) studies that have investigated the rate of overweight/obesity in ADHD populations.

In one of the earliest studies on this issue, (Altfas., 2002) found that within clinical populations of obese patients, there was a significantly higher rate of ADHD than is found in the general population. Furthermore, it seemed that symptoms of inattention.

In other study, (Davis., et al 2006) examined 110 healthy adult women between the ages of 25 and 46 years of age, and found that although there was no significant relationship between ADHD and BMI directly, there was a significant relationship between ADHD symptoms and overeating, and between overeating and BMI, suggesting that overeating moderated the relationship between ADHD

**Obesity in an Egyptian Sample  
of Attention Deficit Hyperactivity  
Disorder Children**

Dr.Mona Medhat Reda

Assistant Professor of psychiatry ,Institute of  
Post Graduate Childhood studies

Ain-Shams University

Dr. Ghada Farag El Dorry

Professor of Pediatric and Dean of Institute of  
Post Graduate Childhood studies

Ain-Shams University

Dr. Naglaa Salah Rabie

M.B.,B.ch., M.Sc. Pediatric Ain-Shams

**Summary:**

Attention-deficit/ hyperactivity disorder (ADHD) is a neurobiological syndrome with an estimated prevalence among children and adolescents of 5%. ADHD, which may be rooted in the failure of the brain to develop at a normal rate.

Obesity and attention-deficit hyperactivity disorder (ADHD) are both increasing in prevalence. Studies in humans have found an association between obesity, poor cognitive performance and ADHD.

**Aim of the study:**

As the prevalence of childhood obesity increases, identifying groups of children who are at increased risk of overweight is important. The current study estimated the prevalence of overweight in children and adolescents in relation to attention-deficit/hyperactivity disorder and medication use, and correlate body mass index to Attention- Deficit/Hyperactivity Disorder.

**Subjects And Method:**

Thirty ADHD subjects from both sexes were recruited, between 6-18 years with Body mass Index BMI at or above the 95th percentile for age and sex. Along with 30 healthy age and sex-matched subjects serving as controls.

**Results:**

Majority of cases (21 cases) were children below the age of 12 years. Predominant male presentation in our sample of cases, with 56% presented with hyperactive -impulsive type. Obesity was evident in 47% of subjects, with no significant difference between children and adolescents., showing, that there is no significant correlation between gender distribution in cases, age obesity, developmental history and types of ADHD. There is also no significant correlation between, BMI, and age, sex, administration of treatment and socioeconomic level in ADHD patients.

**Conclusion:**

The previous researchers some of them had identified a link between ADHD and overweight and