

## Original article

## Definition of conduct disorder in comparison of externalizing behavior disorders in obese and non-obese children

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**Abstract:** This study compares externalizing behavior disorders in overweight and normal-weight boys. The statistical population includes all the male students of elementary schools in Mashhad, who were selected using the cluster sampling method, six districts, and among the schools in this district, two boys' schools and a total of 222 students were selected as the research sample. Children's Behavior Checklist (CBCL) was used as a tool in this study. The results showed that, in general, there is a significant difference in externalizing behavior disorders between overweight and normal-weight boys ( $P < 0.05$ ), which is seen in conduct disorder and oppositional defiant disorder. In comparison, these two groups had no significant difference in attention deficit hyperactivity disorder ( $P < 0.05$ ). According to the results of the research, informing and changing the attitude of parents in preventing the occurrence of obesity and overweight and ultimately behavioral problems seems necessary, and since the deviation from normal weight is related to inappropriate and risky behaviors, early interventions and appropriate planning in this field is practical and necessary during the sensitive period of childhood.

**Keywords:** Externalized Behavioral Problems, Overweighting, Children.

## 1. Introduction

Research has shown that 41-22% of children and teenagers struggle with various behavioral and emotional problems and disorders (Zang, 2017). Aschenbach and Rescorella (2021) believe that childhood behavioral disorders can be classified mainly into two broad dimensions: internalized disorders and externalized disorders. Jensen, Craig, Boyce, and Pickett (2021) consider externalizing behaviors as behaviors directed outside the child and affect most people interacting with the child, such as parents, teachers, and peers. Behaviors such as arguments, breaking the rules, and disobedience cause abuse of people other than the child. These problems reflect the child's conflicts with the surrounding environment (Moradi Mutlaq, Abedin, and Heydari, 2018). Externalizing disorders are among the most resistant disorders of childhood and are known as the core of children's behavioral problems (cited by Birami, 2018). These disorders are presented in the form of three disorders: attention deficit hyperactivity disorder, conduct disorder, and oppositional defiant disorder (Richard, Barbara, Andrew, Jen, and Adrien, 2022).

The prognosis of this disorder is unfavorable and affected children are at risk of other problems in the coming years, such as learning disorder, mood disorder, anxiety and substance abuse, and antisocial personality disorder (Richard et al., 2022). Career, family, and marital incompatibilities are also other issues raised. The research indicates the relationship between overweight and behavioral problems (Arhat et al., 2019; Mamun et al., 2019; Farhat, Inoti, and Simmons-Morton, 2020; Pott, Albarat, Heaney, Hebrandt, and Pauli-Pott, 2023). Childhood overweight and obesity is a growing concern, with prevalence nearly tripling since 1980 and obesity increasing dramatically in the past decade (Ogden, Carroll, Keith, & Fligal, 2022). In Iran, Mirmiran, Mirblouki, Mohammadi Nasrabadi, and Azizi (2019) reported in a study that the prevalence of abnormal weight, including thinness, overweight, and obesity, was high in teenagers, so 12.6% of teenagers are overweight, which 8 11.0% were boys and 13.3% were girls. In general, epidemiological research has shown that the rate of psychological injuries is higher in overweight and obese children (Hebe Brand and Herpertz Dahlman, 2019). In a longitudinal study, Mamun et al. (2022) reported that behavioral problems in childhood and adolescence predict overweight in adulthood.

Recent studies have shown a relationship between being overweight and attention deficit hyperactivity disorder (Agranat-Mijd et al., 2015; Kurtz et al., 2016; Kurtz and Morquillo-Penalor, 2020; Kurtz and Vincenzi, 2022). However, the evidence on the relationship between overweight and attention deficit hyperactivity disorder is not entirely consistent, and some studies have also reported a

lack of relationship between these two variables (Mastillo et al., 2023; Britt, Close, Verbiken, & Valiberg, 2017; Kartz et al. colleagues, 2017; Dubno-Rose, Perry and Berger, 2022). For example, during a study, Pine, Cohen, Brook, and Kaplan (1997) reported that conduct disorder is related to weight gain. Also, other studies have shown a positive relationship between being overweight and smoking (Cawley, Markowitz, & Truss, 2014; Lawry, Glaska, Fulton, Wechsler, & Kahn, 2022), drinking alcohol (Strauss, 2022; Pach, Nelson, Lytell, Moe, & Perry, 2018), drug use (Berg, Simonson, & Rehnquist, 2020; Adams & Rainey, 2022; McLaren, Beck, Pattern, Fick, & Adair, 2021), bullying and harassment (Johnson et al., 2021; Griffith, Welk, Page and Harwood, 2016) and conflict and violence (Hessler et al., 2021; Pach et al., 2021; Zeller, Ritter-Partil, and Rami, 2021) in adolescents. In general, the psychological consequences of obesity are significant, including a decrease in self-esteem, poor self-image, quality of life, and an increase in the possibility of suffering from mental disorders (Ogden (2022); quoted by Aghahar Harris, Alipour, Jan Zagiri, Mousavi, and Nouhi (2019)).

Childhood is one of the most critical stages of life in which a person's personality is founded and formed. Most behavioral disorders and inconsistencies after childhood are caused by a lack of attention to the sensitive childhood period and proper guidance in growth and development. On the other hand, studies have shown that obesity in childhood has a direct relationship with obesity in adulthood, and usually, an obese child will become an obese adult, and obesity also carries many risks (Mulvany, K. Imming, Goodwin, and Kwan, 2026). Therefore, knowing the influential factors, prevention, and related interventions is crucial in this era. Also, most of the studies conducted in Iran have dealt with the prevalence of overweight and obesity, and externalized behavioral disorders have received less attention, and contradictions can be seen in the results of the studies; Therefore, the present study was conducted to compare externalizing problems in overweight boys with normal-weight boys.

## 2. Materials and Methods

### 2.1. Participants

The current research design is a descriptive-comparative design conducted on 222 male students of elementary schools in Mashhad. Using the cluster sampling method, two schools were selected in the six districts of Mashhad, and after obtaining permission from the school principal and informed consent to participate in this research, the parents completed the questionnaire. The height and weight of the students were recorded and based on that, the body mass index was calculated, and the students



who did not have any specific physical illness, and did not use any medicine that was effective in weight loss, were selected as participants. Also, another criterion for entering the sample is that students must be in the age range of 7 to 11 years. Among the characteristics of the sample group, it can be mentioned that 6% of the participants were eight years old, 26% were nine years old, 3% were ten years old, and 26% were 11 years old. Among the participants in the present study, 136 were overweight, and 84 were normal weight. Also, among other characteristics of the sample group, it can be mentioned that 34.4% of fathers had government jobs, and 53.6% had freelance jobs. 64.8% of the mothers of these students were housewives, and 23.2% were employed. The highest degree of bachelor's degree education is found in both fathers, with 42.4%, and mothers, with a frequency of 42.8%.

### 2-2. Instruments

This study used the Children's Behavior Checklist (CBCL) to investigate behavioral problems. Aschenbach designed this scale in 1991 to determine children's behavioral problems. The child's behavior checklist is completed by the parents or the person in charge of the child's guardianship between the ages of 6 and 11. This behavioral checklist includes two parts; the first part includes open-ended questions related to the child's competence in various fields, such as his activities and social relations, and the second part includes grading the child's emotional-behavioral problems. There are 113 items in this section, and the respondent grades each item as zero, one, and two (false, somewhat accurate, and entirely true) based on the child's condition in the last six months. This scale examines two groups of children's behavioral problems. One of these groupings is internalized problems and includes three symptoms of emotional problems (depression), anxiety, and physical complaints, and the second grouping, called externalized, includes three symptoms of hyperactivity-attention deficit, confrontational neglect, and behavior. In this way, the raw score of internalized and externalized

problems can be easily obtained by adding the raw score of two or three related symptoms.

### 2-3. Procedure

In the present study, only questions that measure externalizing problems were used. Children's behavioral problems are considered to be one of the most effective tools for measuring and diagnosing childhood disorders, the validity and reliability of which have been proven in various research (Dolanp and Reny, 2017; Youngstrom, Youngstrom, and Starr, 2019). The reliability of this scale is at a relatively high level, and its range is from 0.65 to 0.85 for the child behavior list and 0.84 to 0.88 for the self-report list. The alpha coefficients of syndromic scales are satisfactory and range from 0.61 to 0.84 for the child behavior list. Also, the syndromic scales based on experience are satisfactory, and their range is reported from 0.67 to 0.88. In addition, the internal consistency coefficient for the subscale of hyperactivity problems, 0.82 and 0.72 conduct problems, has been reported. In the standardization of this test in the Iranian population, internal consistency coefficients of scales and subscales were obtained between 0.87 and 0.73. Test-retest validity (between 5 and 8 weeks) also determined the significance of all correlation coefficients between 0.97 and 0.38 (Minai, 2014). After Iranian standardization, this questionnaire was used in many domestic types of research, which shows the validity of this tool.

### 2-4. Statistical Analysis

The SPSS version 23 software program analyzed the research data. Descriptive statistical methods, including mean and standard deviation, and inferential statistics, including multivariate analysis of variance (MANOVA), were used to analyze the research data.

## 3. Results

The descriptive characteristics of the variables of the present study (mean and standard deviation) are presented in Table No. 1.

**Table 1.** Descriptive indicators of externalizing problems in the group of overweight boys with normal weight

Variable	Groups	Average	The standard deviation
<b>Attention deficit hyperactivity disorder</b>	obese	2.94	2.29
	normal	2.57	1.95
<b>Confrontational neglect</b>	obese	1.83	1.88
	normal	1.23	1.5
<b>Conduct disorder</b>	obese	3.83	3.85
	normal	2.52	3.2
<b>All problems are externalized</b>	obese	5.74	4.2
	normal	3.9	3.22



As seen in Table 1, overweight students obtained more scores in externalizing problems than those with normal weight. In this way, the average externalized problems in overweight students (5.74) is higher than in the normal weight group (3.9). Also, in the problems of hyperactivity-attention deficit, confrontational neglect, and behavior, the average scores obtained in the group of overweight students are higher than normal-weight students. Also, to test the purpose of the research, which was to compare externalized problems in overweight and normal-

weight students, a multivariate analysis of variance method was used. Based on multivariate analysis of variance (Wilks Lambda = 0.953 and F = 4.08 at the significance level of P = 0.003), it can be said that this study is statistically significant at the level of P < 0.05. In order to find out which of the externalized problems in the group of male students with overweight and normal weight male students have a significant difference, a one-way analysis of variance was used in the MANOVA text, the results of which are included in Table No. 2

**Table 1.** The results of one-way analysis of variance in the text of Manova on externalized problems

The dependent variable	mean square	F	sig	Effect size	Test power
Attention deficit hyperactivity disorder	7.38	1.56	0.21	0.007	0.238
Confrontational neglect	18.7	6.1	0.014	0.02	0.692
Conduct disorder	88.71	6.77	0.01	0.03	0.736
All problems are externalized	168.75	11.01	0.001	0.04	0.91

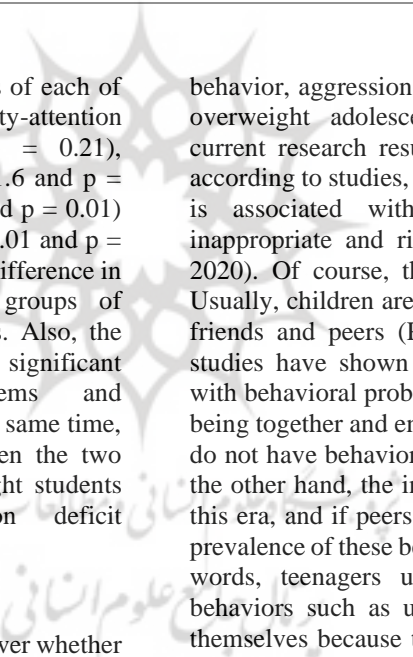
According to table number 2, the scores of each of the variables are as follows: hyperactivity-attention deficit problems (F = 1.56 and p = 0.21), confrontational neglect problems (F = 1.6 and p = 0.014), behavior problems (F = 6.77 and p = 0.01) and total externalizing problems (F = 11.01 and p = 0.001). Table No. 2 shows a significant difference in externalizing problems in the two groups of overweight and normal-weight students. Also, the results from table number 2 show a significant difference in behavioral problems and confrontational neglect at p>0.05. At the same time, there is a significant difference between the two groups of overweight and normal-weight students regarding the hyperactivity-attention deficit variable. Two groups are not seen.

#### 4. Discussion

As stated, the present study aimed to answer whether there is a significant difference in externalizing disorders, including attention deficit hyperactivity disorder, confrontational neglect, and conduct among overweight and normal-weight boys. The results showed that there is a significant difference between these two groups in terms of behavior problems and confrontational neglect. These results are consistent with previous research (Pine et al., 2000; Cowley et al., 2014; Lari et al., 2022; Jansen et al., 2014; Hessler et al., 2014; Pach et al., 2018; Zeller et al., 2018). Among them, we can mention the study of Farhat et al. (2020), who reported that being overweight and obese have a significant relationship with drug use in teenagers; Also, the results showed that the frequency of violent

behavior, aggression, and bullying is higher among overweight adolescent boys. In explaining the current research results, it can be mentioned that according to studies, deviation from the ideal weight is associated with increased participation in inappropriate and risky behaviors (Farhat et al., 2020). Of course, the role of peers is also vital. Usually, children are more inclined to eat with their friends and peers (Pott et al., 2023). Also, some studies have shown that children and adolescents with behavioral problems regard food as a means of being together and enjoying more than children who do not have behavioral problems (Davis, 2020). On the other hand, the influence of peers is decisive in this era, and if peers have behavioral problems, the prevalence of these behaviors also increases. In other words, teenagers usually consider inappropriate behaviors such as using drugs as a norm among themselves because their peers use them (Farhat et al., 2020).

We can also mention the role of stress in explaining the results. For example, studies have shown that children who are overweight are less accepted by their peers, which causes them to be humiliated and frustrated, so they engage in inappropriate behaviors to compensate for this deficiency (Booker, Gallagher, Yoger, Ritt-Olson, & Johnson, 2014). Among others, we can refer to the study of Souris (2015), who reported that girls who suffer from chronic diseases are more likely to use drugs. Also, aggressive behaviors are more common in overweight boys, and previous studies have shown that boys are more likely to show externalizing





problems than girls (Card, Stuckey, Salvani, & Little, 2018).

Another point raised in connection with oppositional neglect disorder is that current theories and research show that the two behavior disorders and oppositional neglect exist. However, they are presented as two separate disorders, they have a developmental relationship with each other and the same risk factors have been identified for both disorders. Studies showing developmental connections between these two disorders believe that the difference between these two disorders is quantitative, not qualitative. The International Classification of Diseases considers this disorder to be a milder form of conduct disorder. Instead of considering it as a separate disorder, it considers it as a type of conduct disorder, so if the criteria match conduct disorder, in such a case the diagnosis of oppositional defiant disorder It is not mentioned (Iso, 2023).

Although research excludes the diagnosis of the oppositional defiant disorder in the presence of complete symptoms of conduct disorder, it is not clear in the research literature when these two disorders can occur together (Steiner and Ramsing, 2017). Also, from the results of the present study, there was no significant difference between the two groups of overweight and normal-weight boys in terms of attention deficit hyperactivity disorder, which is also consistent with some studies (Mastillo et al., 2023; Britt et al., 2017; Kartz et al. et al., 2017; Dubeno-Rose et al., 2022) and is inconsistent with some studies (Agranat-Mijd et al., 2020; Kurtz et al., 2016; Kurtz and Morquillo-Penalore, 2020; Kurtz and Vincenzi, 2022). Even though some studies have shown that overweight children usually eat faster, chew less food, and are less able to stop eating, the same characteristics are present in children with attention deficit hyperactivity disorder due to impulsivity and lack of impulse control (Barrett et al. colleagues, 2017); This research obtained other results, in general, the results of studies on ADHD with overweight are contradictory; Therefore, it seems that other variables and factors such as family conditions, parenting styles, biological and neurological changes of the brain and child's sleep patterns. should also be taken into account and the need for more extensive studies in this regard is necessary.

This research was accompanied by limitations, such as the fact that the current research was only conducted on male primary school students in Mashhad, and therefore the results cannot be generalized to students of other grades and cities. On the other hand, as Aschenbach et al. (2000) reported, the questionnaire is reliable for determining children's behavioral problems, but it is better to be used by experts and psychiatrists as well; Therefore, taking into account the mentioned limitations, it is

suggested to design longitudinal and prospective studies to investigate and identify as many influential factors as possible. It is also suggested to use body fat mass index in future studies. According to the results of the present study, there is a difference between behavioral problems and especially behavior problems and neglect. There is a significant difference between the two overweight and normal-weight boys groups. Therefore, it seems necessary to inform and change parents' attitudes toward preventing obesity and overweight and, ultimately, behavioral problems. Other studies in this field have shown that deviation from normal weight is associated with inappropriate and risky behaviors. Of course, other psycho-social issues also contribute to this and should be considered. Early interventions and proper planning in this field during childhood are very effective and necessary.

**Limitations:** The current research has some limitations. First of all, the current research is a type of correlational research and correlation research cannot show causal relationships, so it is necessary to use experimental research in future research. Second, in this research, a questionnaire was used to collect data. Therefore, considering that the questionnaires were self-assessment, there may be bias in the answers. It is suggested that in future researches, the observational method should be used to collect information, and it is necessary to use other methods such as interviews to collect information on the variable of religious attitude..

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## مقایسه آشفته‌گی‌های رفتاری برونی‌سازی شده با تصریح بر اختلال سلوک در کودکان چاق و نرمال

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**چکیده:** این مطالعه به مقایسه آشفته‌گی‌های رفتاری برونی‌سازی شده در پسران دارای اضافه وزن و با وزن طبیعی پرداخت. جامعه آماری شامل کلیه دانش آموزان پسر مدارس ابتدایی شهر مشهد بود که به روش نمونه‌گیری خوشه‌ای، ابتدا شش ناحیه انتخاب و از بین مدارس این ناحیه‌ها، دو مدرسه پسرانه و در مجموع ۲۲۲ دانش آموز به عنوان نمونه پژوهش انتخاب شدند. در این مطالعه از چک لیست رفتار کودکان (CBCL) به عنوان ابزار استفاده شد. نتایج نشان داد که فاوت معناداری در آشفته‌گی‌های رفتاری برونی‌سازی شده بین پسران دارای اضافه وزن و وزن طبیعی وجود دارد ( $P < 0/05$ ) که در اختلال سلوک و اختلال نافرمانی مقابله‌ای قابل مشاهده است. در مقایسه، این دو گروه در اختلال نقص توجه و بیش‌فعالی تفاوت معنی‌داری مشاهده نشد ( $P > 0/05$ ). با توجه به نتایج پژوهش، اطلاع‌رسانی و تغییر نگرش والدین در پیشگیری از بروز چاقی و اضافه وزن و در نهایت مشکلات رفتاری ضروری به نظر می‌رسد همچنین از آنجایی که انحراف از وزن طبیعی به رفتارهای نامناسب و پرخطر مربوط می‌شود، مداخلات زودهنگام و برنامه‌ریزی مناسب در این زمینه به ویژه در دوران حساس کودکی ضروری است.

**واژه‌های کلیدی:** مشکلات رفتاری برونی‌سازی شده، اضافه وزن، کودکان

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این نماد به معنای مجوز استفاده از اثر با دو شرط است یکی استناد به نویسنده و دیگری استفاده برای مقاصد غیرتجاری.