

Full Length Research Paper

Patterns and co morbidity of attention deficit/hyperactivity disorder among school children in Khartoum state-Sudan

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Abstract

Background: Attention Deficit Hyperactivity Disorder (ADHD) is a neurodevelopmental childhood disorder characterized by inappropriate poor attention span or age-inappropriate features of hyperactivity and impulsivity and/or both. The aim of this study is to estimate the prevalence of attention-deficit hyperactivity disorder among Sudanese schools children to explore the comorbid conditions with ADHD and to identify the associated factors. **Methods:** 1200 students (boys and girls) of the age range of 7-14 years were randomly selected out of 75003 total number of students enrolled in 190 general basic schools in Khartoum State. Using SNAP-IV-C teacher and parent rating scale, which is a revision of the Swanson Nalon and Pelham (SNAP) questionnaire. Screening for attention deficit hyperactivity disorder, which is a triad of inattention, hyperactivity and impulsivity. **Results:** The total (the overall) prevalence in this study for both parents and teachers scale for inattentive, impulsive and or both subtypes are 9.4 %. And the prevalence of (ODD) among students who had ADHD, both inattentive and impulsive symptoms in both settings is 2.3%. **Conclusion:** The study showed the prevalence of ADHD symptoms among school children in Sudan was high in both settings, teacher and parent. ADHD symptoms are more common among boys than girls and more prevalent among late childhood.

Keywords: childhood, attention, teacher, parents.

INTRODUCTION

Attention-Deficit/Hyperactivity Disorder (ADHD) is a cognitive and behavioral disorder that affects school-age children, and is characterized by a triad of inattention, hyperactivity and impulsivity that is inconsistent with the child's developmental level. Children with ADHD typically

exhibit behavior that is classified into two main categories: poor sustained attention and hyperactivity-impulsiveness. As a result, three subtypes of the disorder have been proposed by the American Psychiatric Association in the fourth edition of the Diagnostic and

Statistical Manual of Mental Disorders (DSM-IV): predominantly inattentive, predominantly hyperactive-impulsive, and combined types (Barkley, 1997).

The symptoms are especially difficult to define because it is hard to draw a line at where normal levels of inattention, hyperactivity, and impulsivity end and clinically significant levels requiring intervention begin (Ramsay and Russell, 2007).

For diagnosis of ADHD, manifestations of the disorder must be present in more than one settings (e.g home and school, work), (the American Psychiatric Association in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders. 2013). Symptoms must be observed in two different settings for six months or more and to a degree that is greater than other children of the same age. (Diagnostic and statistical manual of mental disorders: DSM-IV. (American Psychiatric Association. 2000) Confirmation of substantial symptoms across settings typically cannot be done accurately without consulting informants who have seen the individual in those settings; typically the symptoms vary depending on context within a given setting. (The American Psychiatric Association in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders. 2013). Both types of children with ADHD may be less cooperative with others and less willing to wait their turn or play by the rules (NIMH, 1999; Swanson, 1992; Waslick and Greenhill, 1997). Their inability to control their own behavior may lead to social isolation. Consequently, the children's self-esteem may suffer (Barkley, 1990a).

When ADHD is left unidentified or untreated a child is at great risk for impaired learning ability, decreased self-esteem, social problems, family difficulties and potential long-term unfavorable effects. (Gentile et al., 2006)

ADHD is a chronic disorder (VanCleave et al., 2008) with 30 to 50 percent of those individuals diagnosed in childhood continuing to have symptoms into adulthood. (Balint et al., 2008) Up to 35% of children with ADHD have some other comorbid psychiatric disorder. Comorbidity with oppositional defiant disorder (ODD) being one of the most frequent. (Kadesjo and Gillberg, 2001; Souza et al., 2004)

By early adulthood, ADHD is associated with an increased risk of suicide attempt, primarily when comorbid with mood, conduct, or substance use disorders. (The American Psychiatric Association in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders. 2013).

Objectives

The objectives of this study are to estimate the prevalence of attention-deficit hyperactivity disorder among Sudanese schools children and to explore the comorbid conditions with ADHD and to identify the associated factors.

METHODS

This is a descriptive cross sectional study, done on school children of basic educational schools in Khartoum, the capital city of Sudan. The city is composed of three major towns, Khartoum, Omdurman and Khartoum north. The latter was randomly selected as study area.

Study population was the students of general basic school children in the area. The total number of students enrolled in 190 schools was 75003 students. 1200 of students were randomly selected. Parents and teachers of those children filled SNAP-IV-C, teacher and parent rating scale which is a revision of the Swanson, Nalon and Pelham (SNAP) questionnaire (Swanson et al., 1983). Screening for attention deficit hyperactivity disorder which is a triad of inattention, hyperactivity and impulsivity was done.

Proportional and simple random sampling was done with the help of the epidemiologist multistage. Data was collected by direct interviewing the children by their parents and teachers, screening for symptoms of ADHD using parent and teacher screening scale respectively, after they were been trained about how to fill the questionnaire. Socio-demographic data questionnaire was filled by the teacher with the help of the parents.

The SNAP-IV is a behavioral rating scale based on a 4-point Likert scale (0 to 3 rating scale): Not at all = 0, Just a Little = 1, quite a bit = 2, and very much = 3. Subscale scores on the SNAP-IV are calculated by summation of the scores on the items in the subset and dividing by the number of items in the subset. The score for any subset is expressed as the Average Rating-Per-Item, then cut off point for each subset group was taken to identify the sub type of symptoms the student have.

The tentative 5% cutoff point for ADHD inattention for teacher is 2.56 and for parent is 1.78. For ADHD hyperactivity-impulsivity is 1.78 for teacher and 1.44 for parent were used, it was translated in Arabic, and a pilot study was done in 50 students from a separate school.

The collected data was analyzed using Statistical Package of Social Sciences (SPSS).

Ethical approval was obtained from Sudan Federal Ministry of Health and ethical consent was taken from all participants and parents.

RESULTS

Out of the 1200 study population, 200 were excluded. Some were lost in the schools and other was omitted due to deficient information. With the response rate of 83%, all of them were enrolled in the general basic schools.

Demographic data

The number of boys were 511 (51.1%) and the girls were

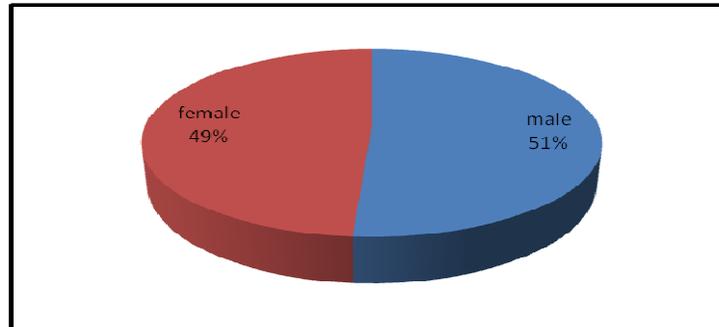


Figure 1. Distribution of study population according to gender

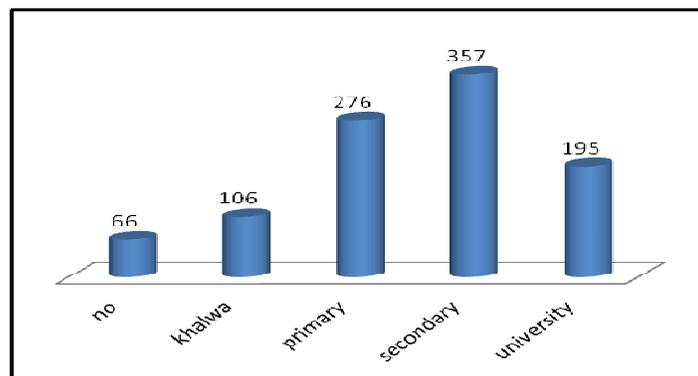


Figure 2. Father's educational level of the study population

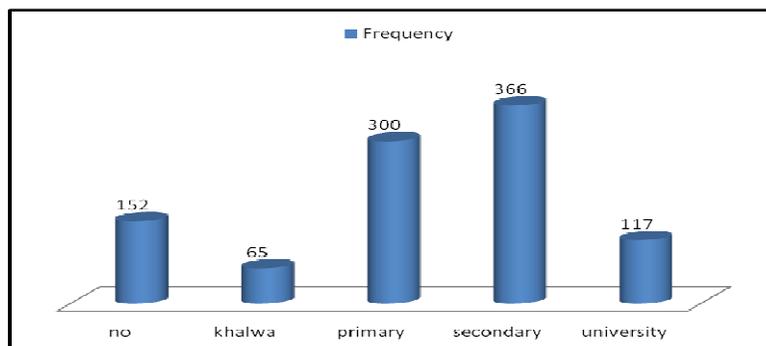


Figure 3. Mother's educational level in study population

489 (48.9) as in figure 1.

The level of education of their fathers showed that 552 (55.2%) of the fathers have secondary and higher level of education, while 382 (38.2%) have khalwa and primary level, only 66 (6.6%) were illiterate, figure 2.

The mothers education showed 483 (48.3%) have secondary and higher level, 365 (36.5%) have primary and khalwa level, and 152 (15.2%) have not educated, figure 3.

The scale data

The prevalence of ADHD symptoms in the two setting the parents and teachers together, for inattentive subtype symptoms was 3.5 %, figure 4 for impulsive subtype was 6.9 %, figure 5 and for combined subtype 1.0%, figure 6. The overall prevalence in this study for both parents and teachers scale for inattentive, impulsive and or both subtypes were 9.4 %.

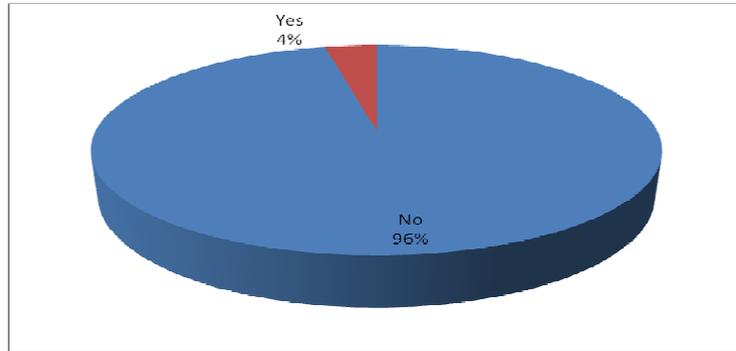


Figure 4. parent + teacher inattention symptoms

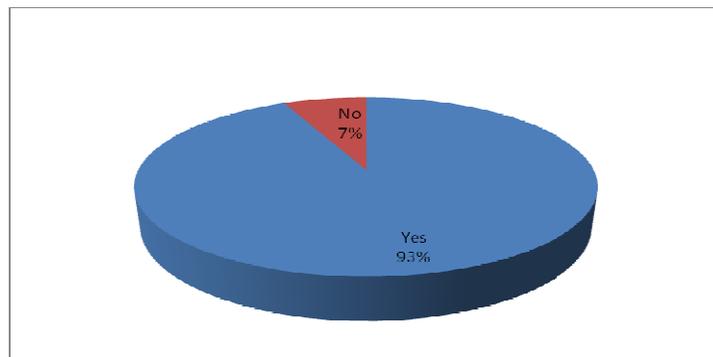


Figure 5. parent and teachers impulsivity Symptoms

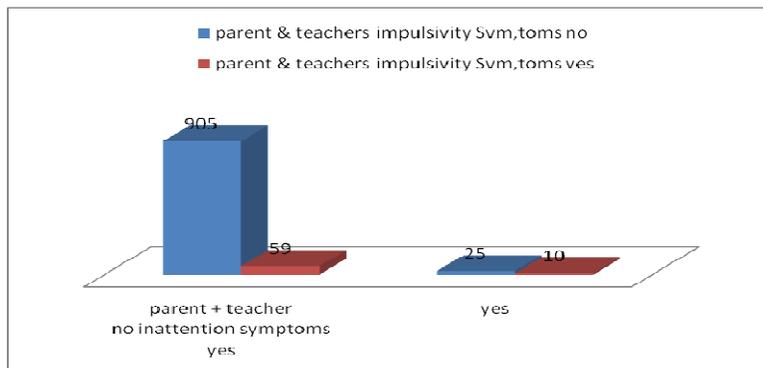


Figure 6. Parent + teacher inattention symptoms * parent & teachers impulsivity Symptoms

Number of boys with symptoms of inattentive subtypes in both teacher and parent setting scales were 25 with a percent of (4.9%), while of girls were 9 (1.8%) with boy to girl ratio of 2.7:1 (p=0.008).

Number of boys with the symptoms of impulsive subtypes in both settings were 48 (9.6%) and of girls were 21(4.3%) with a ratio of 2.3:1 (p=0.002).

In this study the prevalence of oppositional defiant disorder (ODD) symptoms for parent scale was 34 students with the percent 3.4 % and for teacher scales

was 93 students with a percent 9.3%.

In parent scale for ADHD of inattentive subtype the (ODD) is 18 students (1.8%) and of impulsive subtype the (ODD) is 25 students (2.5%)

In teacher scale for ADHD of inattentive subtype the (ODD) is 8 students (0.8%) and of impulsive subtype the (ODD) is 47 students (4.7%)

Those who showed combined symptoms with ADHD is 23 students with the percent of 2.3%. So prevalence of (ODD) among students who had both inattentive and

impulsive symptoms in both settings was 23 students with a percent of 2.3%.

DISCUSSION

Attention deficit hyperactivity disorder (ADHD), which occurs in 3% to 10% of school-age children, is one of the most common child and adolescent psychiatric disorders (Gldman et al., 1998; Gau et al., 2005)

This study showed that the overall prevalence of ADHD symptoms among general basic school children for both parents and teachers setting scales was 9.4%, this was identical to result (9.4%) for overall prevalence of ADHD found in study done among primary school children in the state of Qatar (Bener et al., 2006).

ADHD is a worldwide disorder with a large variability in the estimated prevalence which is due to the methods used rather than geographical variations, this was mentioned as a conclusion in study done by Polanczyk et al. (2007)' the finding in this study suggest that geographic location plays a limited role in the reasons for the large variability of ADHD/HD prevalence estimates worldwide. Instead, this variability seems to be explained primarily by the methodological characteristics of studies.' The diagnostic criteria used appear to influence estimated prevalence (Brown et al., 2001; Graetz et al., 2005). According to study done by American Academy of Pediatric in 2000, ADHD is estimated to affect 5.5%-8.5% of schoolchildren, and the mean prevalence from the various studies carried out is 6.9%. In study done by Rader et al. (2009) about 2 to 16 percent of school-aged children had ADHD disorder.

ADHD prevalence in a sample of 403 school-aged children from a public elementary school was 17.1%. in study done by Vasconcelos et al. (2003). The study showed the prevalence of inattention sub type symptoms is 3.5% less than the impulsive subtype symptoms, which can be explained by what was reported in the Diagnostic and Statistical Manual of Mental Disorders 2000. Children with the inattention subtype are less likely to act out or have difficulties getting along with other children. They may sit quietly, but without paying attention to what they are doing. Therefore, the child may be overlooked, and parents and teachers may not notice symptoms of ADHD.

The study showed there was significant statistical difference ($p= 0.002$) in the prevalence of ADHD symptoms of impulsivity subtype in both settings among boys which was more common than in girls. And also in the inattentive subtype with ($p=0.008$) more common in boys .This goes with (Ross and Ross, 1982), who stated that boys are four to nine times more likely to be diagnosed, and the disorder is found in all cultures, although prevalence figures differ (Ross and Ross, 1982).

ADHD is diagnosed two to four times more frequently in boys than in girls (Emond et al., 2009; Singh, 2008). But

in this study when the subtypes of symptoms were analyzed according to gender in both inattentive and impulsive they were more common in boys than in girls which differ from previously published studies, the inattentive subtype being greater in girls and the hyperactive subtype being more prevalent among boys, (Nolan et al., 2001). This may be due to considerer the quietness as good thing specifically for girls and not a problem or a symptom for a disorder.

Most of the fathers, and most of the mothers had secondary and higher level of education, these factors will help in the management of this problem since it needs good understanding of the problems of their children in addition to medication, behavioral therapy, life style changes, counseling and close follow up.

For comorbidity of ADHD with ODD there is statistical association ($p=0.008$) Children whose ADHD is comorbid with just ODD are likely to get into trouble in school and community, but they do not carry the same high risk for poor long-term adult outcomes as do those with comorbid Conduct Disorder (Barkely, 1990).

CONCLUSION

The study showed the prevalence of ADHD symptoms among school children in Sudan was high in both teachers and parent settings, ADHD symptoms more common among boys than girls. These reflect the importance of screening for these symptoms and early detection for the adverse effect on school performance. Accordingly we are in need of school based multidisiplinary team aware of the problem and its management.

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