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### RESEARCH ARTICLE

#### ATTENTION DEFICIT HYPERACTIVITY DISORDER: AN IGNORED DISORDER IN PRIMARY SCHOOL CHILDREN IN ARAR, NORTHERN SAUDI ARABIA.

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#### Manuscript Info

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#### Abstract

**Background:-** Attention deficit hyperactivity disorder (ADHD) is a neglected illness in Arar, Northern area, Kingdom of Saudi Arabia.  
**Objective:-** The objective of this study is to determine the prevalence of ADHD among primary schools children of Arar city, the capital of the Northern province of the Kingdom of Saudi Arabia.  
**Methods:-** A structured self-administered questionnaire was used to collect information from the teachers of children who attended 4 randomly selected primary schools in Arar city during the study period. The Conners 10-item Abbreviated Teacher Rating Scale (ATRS) was used.  
**Results:-** 85 children fulfilled the stated criteria for ADHD giving a prevalence rate of 27.9%.  
**Conclusion:-** The prevalence of ADHD in our setting is 27.9%, which is more than that obtained elsewhere in the world.

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#### Introduction:-

Attention deficit hyperactivity disorder (ADHD) is defined by features of inattention, over activity, and impulsivity. It is the most frequently encountered childhood-onset neurodevelopmental disorder in the primary care settings [1].

ADHD normally affects preschool age children, although it can extend beyond childhood and adolescence into adulthood and a higher prevalence is often reported in males [2].

Publication of the American Academy of Pediatrics (AAP) guidelines for assessment [3] and management [4] of attention-deficit/hyperactivity disorder (ADHD) was a welcome contribution to pediatricians' efforts to improve the care and outcomes of 6- to 12-year-old children with attention and behavior problems. As a chronic disorder that affects 4% to 12% of 6- to 12-year-old children and results in very challenging personal, clinical, educational, and societal problems, ADHD is an appropriate focus for the efforts of the AAP and practicing pediatricians. There remain large discrepancies between pediatricians' practice patterns and the AAP guidelines. As many as 50% of children with ADHD are unidentified and untreated [5].

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ADHD prevalence seems to vary in different settings, such as in the general population versus in hospitals or in schools. In African countries, such as South Africa, Democratic Republic of Congo, or Ethiopia, the prevalence of ADHD has been reported to vary from 5.4% to 8.7% among school children. However, in the general population, ADHD has been reported in 1.5% of children. And children with possible organic brain pathology have been reported to have a prevalence of ADHD of 45.5–100% [6]. The prevalence of ADHD reported on other continents is variable. For instance, prevalence of ADHD in Saudi Arabian primary schools is reported to be as low as 2.7%, while that in Iran is reported to be as high as 13% [7,8]. In South America, the prevalence of ADHD in children is about 6%, while in the USA it is as high as 16% [9-11]. In Germany, ADHD has been reported with a prevalence of 4.8%, while Ukraine has reported the highest incidence of ADHD to be 19% [12]. Worldwide, the prevalence of ADHD is between 5.29% and 7.1% while in Nigeria study it was reported a prevalence of 3.2% [13].

Zito et al [14] found that black youths were 2.5 times less likely to receive methylphenidate than were white youths. Bussing [15] reported that there are significantly greater barriers to ADHD treatment for girls, blacks, and poorer individuals; these barriers occur at multiple levels, including obtaining evaluations by parents, obtaining the diagnosis by the provider, and obtaining treatment. These studies confirm the importance of establishing appropriate mechanisms to ensure that children of both genders and all socioeconomic, racial, and ethnic groups receive appropriate assessment and treatment.

This study investigated the prevalence of ADHD in Arar city, the capital of the Northern province of the Kingdom of Saudi Arabia. Our hope is that this study will shed light on ADHD in Arar city to help parents of affected children cope with a diagnosis of ADHD.

#### **Study Objective:-**

The objective of this study is to determine the prevalence of ADHD among primary schools children of Arar city, the capital of the Northern province of the Kingdom of Saudi Arabia.

#### **Sample Size Estimation**

The minimum sample size required for this study was calculated using the following formula [16]

$$N = Z^2 P(1-P) / D^2$$

where Z (i.e., the level of significance) = 1.96; P= Prevalence of children with ADHD 16% (maximal prevalence from a USA study); D = Tolerable error (0.05).

Using the formula above, we determined a minimum sample size of 206 patients. In anticipation of a 10% rate of attrition, the minimum sample size for our study is 270.

The study conducted in four randomly selected primary schools in Arar city. Three hundred and five children and their teachers who met inclusion criteria filled the predesigned questionnaire which include the relevant questions for obtaining the needed socio-demographic data as age, sex, birth order between siblings, mother's and father's age, work and education, consanguinity between parents and average family income. 10 items of the Conners 10-item Abbreviated Teacher Rating Scale was translated and included in the questionnaire. Three hundreds of participants completed the questionnaire and were consecutively recruited into our cross sectional study between the 1st of March and the 30th of May, 2016.

A cutoff score of 15 on the Conners 10-item Abbreviated Teacher Rating Scale (ATRS) [17], based on a study from this laboratory, has been widely used by investigators for diagnosis of the syndrome known now as Attention Deficit Disorder with or without Hyperactivity. Children with scale higher than 15 considered to have the ADHD while children with scale less than 15 considered to be free.

#### **Ethical Consideration and Consent:-**

Ethical clearance for this study was sought from the Research and Ethical Committee of the Northern Border University of Arar, KSA and approved by Directorate of the Ministry of Education of the city. Informed consent was sought from parents/caregivers of potential subjects before enrolling them into the study.

**Data Analysis:-**

Data was analyzed using the SPSS statistical package, version 16. The descriptive statistics were used for categorical and continuous variables, respectively.

**Results:-**

Three hundred children were included in this study, 180 children were male, 87 children were in the age group <8 year, 33% were between 8 and 10-years-old and 81(27%) of children were in the age group 10 and 12-years-old. The birth order of 39% of the studied children was the first child between their siblings and only 30 of them were the last in order between siblings. 120 children had mothers who were between 30-40 year-old and 132 children had fathers in the same age group.

No consanguinity was reported between parents of most of the studied children (90%). More than half of the studied children had their parents with university education. Mothers of 64% of the studied children were house wives and fathers of 41% of the studied children worked as teachers. Of the studied children, 45% had family income between 11000 and 15000 SR (Table 2).

Eighty children had ADHD with a percentage of 26.6% (Table 1).

**Table 1:-** Percentage distribution of ADHD in the studied children, Arar, KAS.

ADHD	No.	%
No	220	73.3
Yes	80	26.6
Total	300	100.0

**Table 2:-** Sociodemographic characteristics of the studied children, Arar, KSA.

Age group	No (n = 305)	%
< 8 year	87	29.0
8 -	99	33.0
10 -	81	27.0
12 +	33	11.0
<b>Sex</b>		
Female	120	40.0
Male	180	60.0
<b>Child order between siblings</b>		
1st one	117	39.0
2nd one	60	20.0
3rd one	42	14.0
4th one	18	6.0
5th one	15	5.0
more than 5 <sup>th</sup>	18	6.0
last one	30	10.0
<b>Age of the mother</b>		
< 20 years	3	1.0
< 30 years	96	32.0
30-40 years	123	41.0
40-50 Years	78	26.0
<b>Age of the father</b>		
20-30 years	57	19.0
30-40 years	132	44.0
40-50 Years	87	29.0
50-60 years	21	7.0
>60	3	1.0
<b>Consanguinity</b>		
1st degree	24	8.0
2nd degree	6	2.0

No	270	90.0
Mother's education		
Not educated	75	25.0
1ry school	24	8.0
Intermediate school	6	2.0
2ry school	27	9.0
University	168	56.0
Father's education		
Not educated	3	1.0
1ry school	18	6.0
2ry school	105	35.0
University or more	174	58.0
Mother's work		
House wife	192	64.0
Nurse	27	9.0
Teacher	81	27.0
Father's work		
Not work	3	1.0
Nurse	48	16.0
Retired	15	5.0
Soldier	93	31.0
Teacher	123	41.0
Work in private sector	18	6.0
Family income range		
< 8000 SR*	24	8.0
8000-10000 SR	111	37.0
11000-15000 SR	135	45.0
>15000 SR	30	10.0

SR\* Saudi Ryal

### Discussion:-

This study conducted to show the prevalence of ADHD in Arar city, the capital of the Northern province of the Kingdom of Saudi Arabia, hoping to shed light on ADHD in Arar city to help parents of affected children cope with a diagnosis of ADHD and seek medical advise.

In this study we determined that the prevalence of ADHD was 26.3%. our figure is far more than the prevalence of ADHD in other studies Saudi Arabian primary schools is which reported to be as low as 2.7%, while that in Iran is reported to be as high as 13% [7,8]. In South America, the prevalence of ADHD in children is about 6%, while in the USA it is as high as 16% [9-11].

In contrast to Nigeria study which found the prevalence of ADHD was 3.2% [1114] and other reviews of the literature have reported highly variable prevalence rates for ADHD worldwide, Ukraine has reported the highest incidence of ADHD to be 19% [12]. The prevalence of ADHD is between 5.29% and 7.1% [13] to a high of almost 20% among school-age American children [18]. This prevalence was determined from studies conducted in a school environment. Although the causes of the variability in ADHD prevalence worldwide are unknown, geographic and demographic factors have been implicated [19]. The prevalence of ADHD obtained in our study is similar to that of studies conducted in schools, where prevalence of ADHD has been reported from 1.7% to 17.8% [20,21].

The opinion that geographic location may influence the epidemiology of ADHD and attention deficit hyperactivity symptoms persists despite findings to the contrary in a few studies that culture and geographic location may have little to no influence on the epidemiology of ADHD worldwide [22].

It has also been argued by other experts that the variability in ADHD/HD prevalence estimates may be best explained by the use of different case definitions. They argue that the actual prevalence across geographic sites should not vary when case definitions are identical [23,24].

### Conclusion and Recommendation:-

We conclude that the prevalence of ADHD in our setting was similar to that in other parts of the world, and there is need for additional studies in this region. This is because ADHD is one of the emerging mental health problems and a neglected health issue in Arar, KSA.

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