Original Article

Attention deficit and hyperactive disorder among primary school children in Obio/Akpor Local Government Area of Rivers State: prevalence and predictive factors

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Abstract

Background: Attention deficit/hyperactivity disorder (ADHD) is a common neurobehavioral disorder that affects children. A consistent pattern of inattention and hyperactivity or impulsiveness, or both, is the hallmark. These behaviours are typically considered age-inappropriate. Risk factors for ADHD are numerous, including prematurity, low birth weight and neurologic factors. This study aims to determine the prevalence and predictors of ADHD among primary school children in Rivers State.

Methods: A cross-sectional analytic study was conducted in 2025 among pupils aged 6-12 years. A self-administered questionnaire and the Vanderbilt ADHD Diagnostic Rating Scale (VADRS) were used as study tools. Data were analysed with SPSS version 25.

Results: Of the 396 subjects, 39 (9.8%) were identified with ADHD using the teacher version VADRS, whereas the prevalence was 14 (3.5%) using the parent version. More males, 26 (12.7%), had ADHD compared to 13 (6.8%) females. The sex difference in prevalence was significant (p = 0.005). The inattentive subtype was more common (56.4%), with males under 10 years more affected. Male sex (OR=2.01; p=0.05; 95% CI: 1.00–4.04), family history of ADHD (OR=8.05; p=0.0004; 95% CI: 2.07-41.35), preterm delivery, low birth weight, and delivery outside a health facility were significant predictors of ADHD.

Conclusion: The prevalence of ADHD is increasing in tandem with the global trend. In our environment, positive family history, prematurity, low birth weight and deliveries in places with unskilled birth attendance are associated with higher risks of ADHD. There is a need to create awareness among the populace to reduce the preventable risk factors.

Keywords: ADHD, prevalence, predictive factors, primary school, children, Rivers State

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INTRODUCTION

Attention deficit/hyperactivity disorder (ADHD) is a common neurobehavioral disorder that affects children. ADHD can cause significant impairments in functioning across multiple settings. It is usually diagnosed when a child struggles to achieve their school or academic goals for their age. Although symptoms often appear in early childhood, they can persist into adulthood. [1] A consistent pattern of inattention and hyperactivity or impulsiveness, or both, is the hallmark of ADHD, and these behaviors are typically considered age-inappropriate. Also, children with ADHD can have some decline in

cognitive function as well as psychiatric symptoms such as anger issues, being destructive, emotional instability, and being overtly disorganized.[2] Alikor et al[3] reported a higher prevalence of anxiety, conduct, and oppositional disorders among children with ADHD in Port Harcourt, Nigeria.

ADHD has three subtypes: inattenton, hyperactive-impulsive, and combined types, based on the Fifth Edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5). [1,4,5] Following a meta-analysis, the global prevalence of ADHD was reported as 7.6% among children aged 3-12 years and 5.6% among teenagers.[6] However, a much lower worldwide prevalence has been reported in children.[7-9] The prevalence among Nigerian children varies depending on the study setting and population. Most studies are hospital-based, with small sample sizes being the main drawback. For example, Okunola et al[10] reported a prevalence of 14.6% among children with sickle cell anemia in Benin, Nigeria, and noted that the inattentive subtype was the most common. Similarly, Hogan et al[11] reported a prevalence of 12.4% among primary school children in Uyo, Nigeria; they, however, opined that the hyperactive subtype was more prevalent. In Rivers State, reported prevalence rates among children range from 0.8% to 11.3%.[3,12]

Although, like other neurodevelopmental disorders, the exact aetiology of ADHD is still unknown; however, several risk factors have been linked to it, including genetic, environmental, and neurological factors. Also, events occurring during the antenatal and early life have been reported as predisposing factors to ADHD[1]. Previous works have stated that the patient's age, sex, mode of delivery, social and psychological issues surrounding the family, as well as the birth weight and preterm delivery, were possible predictors of ADHD.[2,13]

Although, there are few prevalence studies on ADHD in Rivers State, a southern state in Nigeria known for high level of pollution due to oil exploration,[2,3] these studies have primarily focused on the comorbidity associated with ADHD.[2.] This focus is essential, as unrecognized and unmanaged comorbidities can get worse over time and significantly reduce the child's developmental potentials.[14] Furthermore, children with ADHD and these comorbid conditions may present challenges not only to themselves but to their parents and teachers.[15] Studies are scarce in this region that address the risk factors for ADHD in Rivers State, hence the need for this survey. This survey aims to determine the prevalence and predictors of ADHD among primary school children in Obio/Akpor Local Government Area of Rivers State.

MATERIALS AND METHODS

Study design

A cross-sectional analytic study design was employed.

Setting of study

This study was carried out in a primary school in Obio/Akpor Local Government Area (LGA), Rivers State. The LGA is bordered to the east by Eleme LGA, to the west by Emohua LGA, to the north by Oyigbo LGA, and the south by Port Harcourt LGA. Obio/Akpor was established in 1989 from the former Port Harcourt LGA. As members of the broader Ikwerre ethnic identity, the indigenous people are Ikwerres. The residents of Obio/Akpor, a multicultural LGA, come from a variety of cultural backgrounds. There are lots of oil exploration activities within the LGA, which have caused environmental pollution. There are several primary and secondary schools in the LGA.

Study participants

Participants were 6 to 12-year-old male and female pupils attending the selected primary school.

Sample size calculation. The formulae for sample size was $n = Z^2 \times \frac{p(1-p)}{d^2}$ which is for a single proportion. [16]

Where n= sample size, Z= 1.96, for the confidence level of 95%, p is 12.4 %,[11] which is the prevalence of ADHD in a school study in Nigeria while d is the margin of error set at 0.05 and a non-response rate of 10%. The calculated sample size was 191 pupils; nevertheless, 450 pupils participated in the study.

Inclusion criteria:

1. Pupils, both males and females, aged 6 years to 12 years, attending the selected primary school for more than 6 months
2. Pupils who gave assent to the study and whose parents /or guardians gave a written consent to the study.

Exclusion criteria

1. Pupils who have other neurologic disorders, eg., epilepsy, intellectual disability.

Sampling method

This study was conducted from January 2025 –March 2025. A public primary school in Obio/Akpor LGA was purposively selected.

Selection of pupils

Using a simple balloting, a proportionate number of pupils were recruited from the 6 arms of classes in the school (Basic 1- Basic 6). A total of 450 pupils were recruited for the study.

Study tool

The study instrument consisted of

1. A self-administered questionnaire. The information obtained was socio-demographic data, family structure and medical information of the pupil. This form was attached to the Vanderbilt ADHD Diagnostic Parent Rating Scale (VADPRS). And was completed by the parents/or guardian of the child
2. The Vanderbilt ADHD Diagnostic Teacher Rating Scale (VADTRS)[17]
3. The Vanderbilt ADHD Diagnostic Parent Rating Scale (VADPRS)[17]

The Vanderbilt ADHD Diagnostic Rating Scale (VADRS)[17] is an instrument for assessing ADHD symptoms in children and adolescents aged 6 to 12 years. In both clinical and research contexts, this scale is essential for recognizing and understanding ADHD behaviors in children. It stands out for its comprehensive approach, which integrates feedback from educators and parents to provide a well-rounded perspective on the child's behavior in various settings. The Vanderbilt Scale is a two-part tool designed to evaluate the three primary symptoms of ADHD: impulsivity, hyperactivity, and inattention. Symptom assessment is based on DSM-5 criteria for ADHD, while the Performance evaluation assesses the impact on academic and social functioning.

A 4-point rating system (0 = Never, 1 = Occasionally, 2 = Often, and 3 = Very Often) is employed by both the VADPRS and VADTRS to evaluate the frequency of behaviors.

To support healthcare professionals in evaluating whether a child's symptoms are consistent with ADHD and meet the diagnostic criteria, VADRS scores are interpreted per the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5). A diagnosis of ADHD in a pupil requires the presence of at least six symptoms within either the inattention domain or the hyperactivity/impulsivity domain; this reflects a persistent pattern of behaviour. In addition, at least one performance item must be rated as a 4 or 5, indicating significant functional impairment, to fulfill the DSM-5 diagnostic threshold for ADHD.

Consent forms were given to the pupils to give to their parents. Children whose parents consented to the study and who also gave assent for the study were given the VADPRS form with attached questionnaire to be completed by their parents.

The teachers of selected pupils completed the Vanderbilt ADHD Diagnostic Teacher Rating Scale (VADTRS). To ensure uniformity and consistency, the teachers were trained on administering the VADTRS form, and several practice sessions were conducted before the survey.

The completed questionnaire and accompanying VADPRS forms were returned to the classroom teachers by the pupils. The researcher and research team retrieved the three study tools and entered the data in an Excel spreadsheet.

Socioeconomic classification: Pupils were grouped into three levels of social classes: upper class, middle class, and lower class by using the revised scoring scheme for the classification of socioeconomic status in Nigeria by Ibadin et al.[18]

Data analysis

Descriptive statistic was done using IBM SPSS Statistics software (version 25.0) (International Business Machines Corporation, Armonk, New York, United States of America). To determine the predictors of ADHD, a binary logistic regression analysis was carried out. A p-value of ≤0.05 was considered significant, results were presented in frequency tables in proportions, percentages and graphs.

Permission was obtained from the Universal Basic Education board and the headmistress of the selected school before the study was carried out.

Anonymity and confidentiality were assured. Consent was obtained from parents, while assent was obtained from the pupils. Patients who had symptoms of ADHD were referred to the University of Port Harcourt Teaching Hospital (UPTH) for further review.

RESULTS

A total of 450 pupils participated in the study, 54 of the forms were not completely filled, hence, were excluded. The final number of participants was 396. Their ages ranged from 6 to 12 years. The mean age was 8.39 ± 1.49 years, and 342 (86.4%) were younger than 10 years. The sex distribution was almost equal with 204 (51.5%) of them being males. Regarding their socioeconomic status, more than half, 215 (54.3%), belonged to the middle class, while 108 (18.4%) were in the upper social class. Most of the participants 298 (75.3%), were from a monogamous family structure. One hundred and eighty-eight (47.5%) came from families with 3–4 children, with 98 (24.2%) of them from families with five or more children (Table 1).

Table 2 shows the medical history of the participants: Most of the participants (90.4%), were born at term with a birth weight of 2.5 kg or more (94.7%). With regards to the place of birth, most were delivered in a health facility (75.5%), whereas 24.5% were delivered in settings like churches, homes, or a traditional birth attendant's place. More than half of the participants (53.8%) were firstborns while there was a positive family history of ADHD in 9 (2.3%) of the pupils.

Of the 396 participants, 39 exhibited symptoms of ADHD, indicating an overall prevalence of 9.8% among the study participants using the VADTRS. (Figure 1). However, using VADPRS, the prevalence reduced to 14(3.5%). Due to the lower prevalence obtained from the parent rating scale, the prevalence from the teachers' rating scale was used for the study, which is 9.8% (Figure 1).

Of the 204 males 26 (12.7%) of them had ADHD compared to 13 (6.8%) of the 192 females. The sex difference in prevalence was significant, p = 0.005 (Table 3).

Figure 2 shows the distribution of ADHD among different ages. Participants aged 7-10 years had higher rates of ADHD, with the highest rates being found among the 8 year olds.

Of the 39 study participants who had ADHD, 13 (33.3%) had the hyperactive/impulsive type, 4(10.3%) had the combined type, while 22 (56.4%) had the inattentive type. Among the male participants, the inattentive type was more (72.3%) and occurred commonly among the 6 -10 year olds (86.3%). The hyperactive/impulsive type, however, had an even distribution across the sexes and the age groups whilst the combined type was the least common (Figure 3).

We conducted a binary logistic regression analysis to determine the factors linked to an increased risk of ADHD among the subjects. There was a statistically significant association among the variables listed below.

Sex: Males were two times as likely to have symptoms of ADHD compared to their female counterparts. (OR=2.01; p=0.05; 95% CI: 1.00–4.04)

Duration of pregnancy: The odds of having ADHD were significantly higher among children who were born before term. The OR shows some protection for babies born at term. (OR=0.25;p=<0.001;95%CI:0.11-0.56)

Birth weight: LBW was linked to a higher odds of having ADHD, as the OR indicates protection of children born with normal weight. (OR=0.24; p=0.003; 95% CI: 0.09–0.66).

Place of birth: The odds of ADHD were

considerably greater for children born outside of hospitals or health facilities. (OR=0.14; p=.001; 95% CI: 0.07– 0.29).

This OR is suggestive of protection for those born in a health facility.

Family history of ADHD: The prevalence of ADHD was shown to be strongly connected with a positive family history (OR=8.05; p=0.0004; 95% CI: 2.07–31.35).

There was no statistically significant difference between ADHD and other variables, viz a viz the birth order, family structure, or social class. (Table 4)

Table 1: Socio-demographic variables

Variables	Frequency N=396	Percentages (%)
Sex		
Males	204	51.5
Females	192	48.5
Age		
6	87	22.0
7	104	26.3
8	92	23.2
9	59	14.9
10	37	9.3
11	10	2.5
12	7	1.8
Social class		
Lower	108	27.3
Middle	215	54.3
Upper	73	18.4
Family structure	298	75.3
Monogamous	98	24.7
Polygamous		
Family size		
1-2	112	28.3
3-4	188	47.5
≥5	96	24.2
Total	**396**	**100.0**

Table 2: Medical history of participants

Variables	Frequency	Percentages
Duration of pregnancy	358	90.4
Term	38	9.6
Preterm		
Birth weight in kg	375	94.7
≥2.5	21	5.3
<2.5		
Place of delivery	299	75.5
Hospital/health facility	97	24.5
Others		
Birth order		
First	213	53.8
Second	105	26.5
Third	21	5.3
Others	57	14.4
Family history of ADHD	9	2.3
Yes	387	97.7
No		

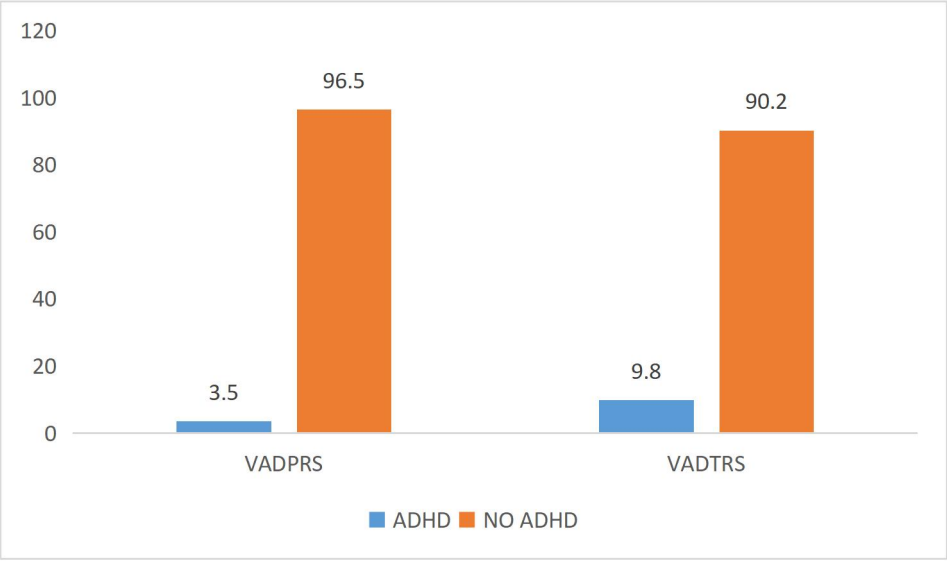

Figure 1: Prevalence of ADHD based on the VADPRS and VADTRS.

Table 4: Binary logistic regression to determine the relationship between the prevalence of ADHD and some medical and socio-demographic variables.

Variables	Positive for ADHD YES	NO	p	OR	95% CI
Sex			0.05	2.01	1.00-4.04
Males	26(12.75)	178(87.3)			
Female	13(6.8)	179(90.2)			
Social class			0.72	1.16	0.51-2.64
Upper	8(11.0)	65(89.0)			
Lower.	31(9.6)	302(90.4)			
Family type			0.15	1.91	0.76-4.70
Nuclear	33(11.1)	265(88.9)			
Extended	6(6.1)	92(93.9)			
Duration of pregnancy			0.000	0.25	0.11-0.56
Term	29(8.1)	329(91.9)			
Preterm	10(26.3)	28(73.7)			
Birth weight (kg)			0.003	0.24	0.09-0.66
≥2.5	23(8.8)	342(91.2)			
<2.5	6(28.6)	15(71.4)			
Place of birth			<0.001	0.14	0.07-0.29
Hospital/health facility	14(4.7)	285(95.3)			
Others-TBAs/home	25(25.8)	72(74.2)			
Birth order			0.31	0.71	0.37-1.38
First	18(8.5)	195(91.5)			
Others	21(11.5)	162(88.5)			
Family history of ADHD			<0.001	8.05	2.07-31.35
Yes	4(44.4)	5(55.6)			
No	35(9.0)	352(91.0)			
Total	39(9.9)	357(90.1)			

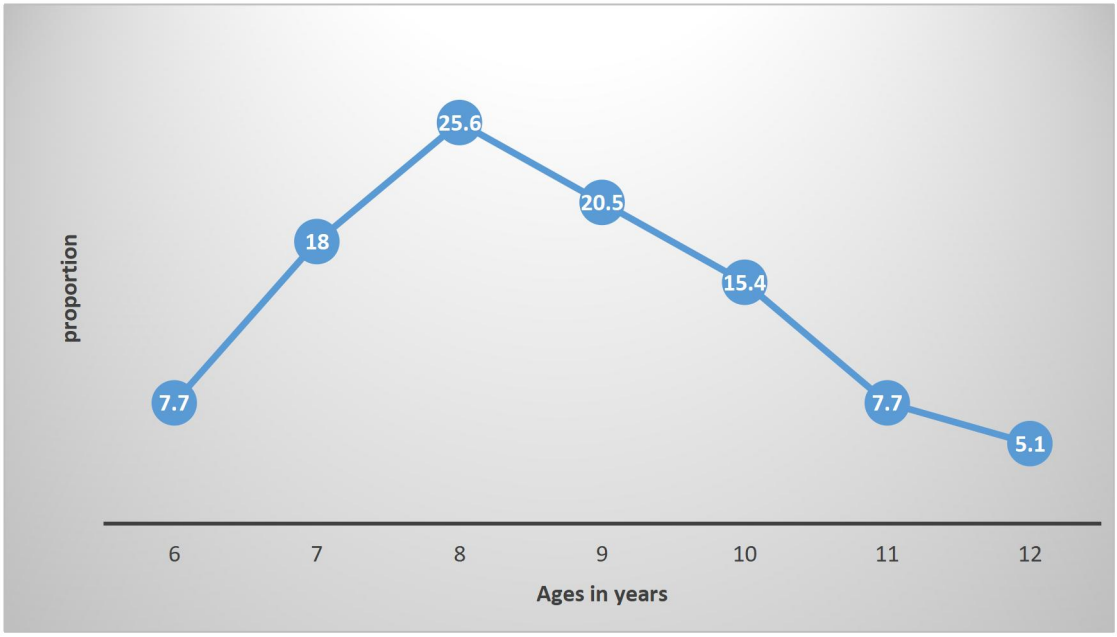

Figure 2: Distribution of ADHD amongst the different ages in the study group.

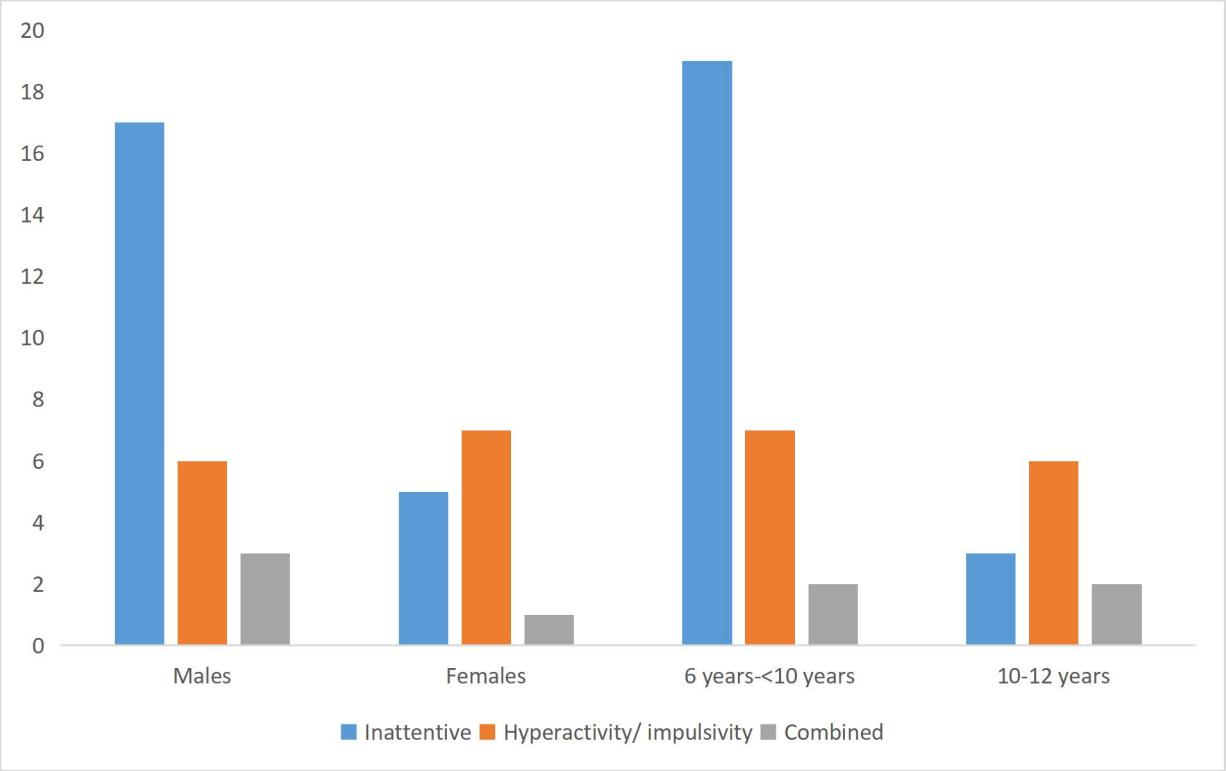

Figure 3: Distribution of ADHD subtypes by sex and age groups.

Table 3: Prevalence of ADHD

Variable	Presence of ADHD Yes	No	Total
Sex			
Males	26(12.7)	178(87.3)	204(100.0)
Females	13(6.8)	179(93.2)	192(100.0)
Total	39(9.8)	357(90.2)	396(100.0)

DISCUSSION

The prevalence of ADHD among school aged children in this study was 9.8%. This was within the statistics obtained among school children in Western and Southern African cohorts which estimated the prevalence rates at 0.8 %-12.4%. [19] The disparities in prevalence rates across these studies may be due to the variations in methodology vis-à-vis the respondents' understanding of the guidelines as stated in the study tools. The discordance in responses between parents and teachers may also affect the diagnosis and overall prevalence rates of ADHD, depending on which was accepted by the researchers. [20] In this present study, the responses by the parents appeared to have culminated in lower prevalence rates compared to the teachers using their respective Vanderbilt study tools; this is similar to findings by Hogan et al [11] in Uyo, Nigeria and also supports previous submissions that information given by teachers may be more sensitive and reliable in optimal diagnosis and management of children with ADHD. [21,22] It could also be plausible that, as in the present study, teachers in the previous surveys may have received training on how to fill the forms, unlike the parents. This training may have improved the objectivity of their assessment, which may have contributed to the higher prevalence observed.

The marked increase in the prevalence of ADHD to 9.8% from a previously reported 0.8% by Alikor et al in Rivers State is significant and disturbing,[3] although the study was conducted more than a decade ago.[3] This increase is in tandem with recent global reports that observed an increase in the prevalence of ADHD over time.[23,24] This observation, which is attributable to certain factors mainly hinged on increased awareness of ADHD in the general population, high morbidity of acute brain infections like meningitis & encephalitis, sequelae of perinatal asphyxia, as well as environmental influences including exposures to

environmental pollutants.[23-26] The latter is an important but seemingly neglected factor in our environment which in recent times is plagued by the menace of soot pollution from poorly regulated and domestic crude oil refining in the past decade and poor air quality indices - a public health concern because of the risk for heavy metal exposure which is a documented risk factor for ADHD.[24,27,28] The low prevalence obtained by Alikor et al[3] was attributed to low school enrollment, especially for the typically young hyperactive child - a factor which may still be prevalent in present times; however, the effect of the environmental influences on ADHD incidence remains a subject of consideration and further research in this environment.[3,24]

The finding of male preponderance in ADHD in this study is similar to other works and literature that have demonstrated that it is more common in males than females.[11,29] The most prevalent subtype of ADHD was the inattentive type (56.4%), with the majority of these being among males who were less than 10 years of age. One-third (33.3%) had the hyperactive/impulsive subtype, while 10.3% had the combined subtype. This pattern is consistent with regional reports on ADHD subtypes in Southern Nigeria, as seen by Alikor et al[6] in Port Harcourt, Ambuabunos et al[30] in Benin City, but at variance with reports by Hogan et al [11] in Uyo that obtained the hyperactive subtype as the most common. Our finding, however, appears to be similar to other studies in Nigeria, and this follows the global trend.[15] There are no conclusive studies on the subject of genetics of ADHD, although it is established that it is heritable in a polygenic manner; our study corroborates this fact as we also found an association with a strong family history among those with ADHD.[32]

In terms of predictors, prematurity and low birth weight appear to be strong risk factors for ADHD in this study. These, in addition to childbirth in unorthodox health facilities - commonly birthing at home, religious places and homes of traditional birth attendants- show that the perinatal complications, including asphyxia and hypoxic ischaemic encephalopathy, are significant risk factors for ADHD in this environment. Our study is in tandem with other works that have shown that low birth weight and perinatal asphyxia are strong predictors of ADHD.[25,33] Our study further suggests that being born in health facilities was less likely to be associated with having ADHD symptoms. This brings to the fore the impact of perinatal asphyxia, low birth weight and small for gestational age on neurodevelopmental and behavioral outcomes, especially in developing countries, which have been fraught with the perennial challenge of maternal and newborn care.[33,34] Perinatal cerebral insults occurring singly or in combination with other factors like acute central nervous system infections and other environmental pollutants may be contributory to the increasing prevalence of ADHD in this environment.[24-26,31,33,34] This study emphasizes the need for skilled birth attendants at delivery and delivery in health facilities that can care for newborns, as this offers adequate transition to extrauterine life, thus reducing the risks for neuronal injury from perinatal asphyxia.[34]

CONCLUSION

The prevalence of ADHD in Rivers State is increasing in tandem with the global trend. The study shows that family history is a significant risk factor for ADHD; however, also pertinent are factors linked with increased risks of perinatal insults such as prematurity, LBW and births in places with unskilled birth attendants. There is a need to create awareness among the populace to reduce these preventable risk factors while ensuring focused antenatal care for all pregnant women.

Limitation of this study

Training teachers on how to complete the study tool and not doing the same for the parents or guardians could constitute a limitation for this study.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Chawla GK, Juyal R, Shikha D, Semwal J, Tripathi S, Bhattacharya S. Attention deficit hyperactivity disorder and associated learning difficulties among

primary school children in district Dehradun, Uttarakhand, India. J Edu Health Promot 2022;11:98.
2. Soheilipour F, Shiri S, Ahmadkhaniha HR, Abdollahi E, Hosseini-Baharanchi FS. Risk factors for attention-deficit/hyperactivity disorder: a case-control study in 5 to 12 years old children. Med Pharm Rep 2020;93(2):175-180.
3. Alikor EAD, Frank-Briggs AI, Okoh BAN. Attention deficit hyperactivity disorder among school children in Port Harcourt, Nigeria. Am J Psychiatry Neurosci 2015;3(2):23-29.
4. Epstein JN, Loren RE. Changes in the definition of ADHD in DSM-5: subtle but important. Neuropsychiatry (London) 2013;3(5):455-458.
5. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders (DSM-5®), 5th edition. Arlington: American Psychiatric Publishing, Inc., 2013.
6. Salari N, Ghasemi H, Abdoli N, Rahmani A, Shiri MH, Hashemian AH, et al. The global prevalence of ADHD in children and adolescents: a systematic review and meta-analysis. Ital J Pediatr 2023;49(1):48.
7. Ogundele MO. Behavioural and emotional disorders in childhood: a brief overview for paediatricians. World J Clin Pediatr 2018;7(1):9-26.
8. Sayal K, Prasad V, Daley D, Ford T, Coghill D. ADHD in children and young people: prevalence, care pathways, and service provision. Lancet Psychiatry 2018;5(2):175-186.
9. Polanczyk GV, Willcutt EG, Salum GA, Kieling C, Rohde LA. ADHD prevalence estimates across three decades: an updated systematic review and meta-regression analysis. Int J Epidemiol 2014;43(2):434–442.
10. Okunola PO, Aina IO, Israel-Aina YT. Attention deficit hyperactivity disorder among children with sickle cell anaemia seen at the University of Benin Teaching Hospital, Benin City, Nigeria. Niger J Paediatr 2022;49(2):102–106.
11. Hogan E, Akpan M, Ijezie E, Edem K. Prevalence of attention deficit hyperactivity disorder symptoms among primary school children in Nigeria: a comparison of teachers and parent reports. Int J Res Med Sci 2022;10(5):1021-1027.
12. West BA, Aitafo JE. Prevalence and pattern of neurological disorders amongst children attending the neurology clinic of a private paediatric hospital in Southern Nigeria. Arch Curr Res Int 2025;25(1):71–81.
13. Russel AE, Ford T, Williams R, Russell G. The association between socioeconomic disadvantage and attention deficit/hyperactivity disorder (ADHD): a systematic review. Child Psychiatry Hum Dev 2016;47(3):440–458.
14. Ghosh P, Choudhury HA, Victor R. Prevalence of attention deficit hyperactivity disorder among primary school children in Cachar, Assam, North-East India. Open J Psychiatry Allied Sci 2018;9:130-135.
15. Loe IM, Feldman HM. Academic and educational outcomes of children with ADHD. J Pediatr Psychol 2007;32(6):643-654.
16. Kish L. Survey sampling. New York:John Wiley & Sons,1965.
17. National Institute for Children's Health Quality. NICHQ Vanderbilt assessment scales used for diagnosing ADHD. Available from: https://nichq.org/wp-content/uploads/2024/09/NICHQ-Vanderbilt-Assessment-Scales.pdf. Accessed 18th January 2025.
18. Ibadin MO, Akpede GO. A revised scoring scheme for the classification of socio-economic status in Nigeria. Niger J Paediatr 2021;48(1):26-33.
19. Bakare MO. Attention deficit hyperactivity symptoms and disorder (ADHD) among African children: a review of epidemiology and co-morbidities. Afr J Psychiatry (Johannesbg) 2012; 15(5): 358–361.
20. Malhi P, Singhi P, Sidhu M. Impact of parent and teacher concordance on diagnosing attention deficit hyperactivity disorder and its sub-types. Indian J Pediatr 2008; 75(3): 223–228.
21. Lavigne JV, Dulcan MK, LeBailly SA, Binns HJ. Can parent reports serve as a proxy for teacher ratings in medication management of attention-deficit hyperactivity disorder? J Dev Behav Pediatr 2012; 33(4): 336–342.

22. Tahıllıoğlu A, Bilaç Ö, Uysal T, Ercan ES. Who predict ADHD with better diagnostic accuracy?: Parents or teachers? Nord J Psychiatry 2021; 75(3): 214–223.
23. Abdelnour E, Jansen MO, Gold JA. ADHD diagnostic trends: increased recognition or overdiagnosis? Mo Med 2022;119(5):467-473.
24. Ahmad S, Naveen KG, Babu AM, Ranjan R, Kumar P. Association between ambient air pollution and attention-deficit/hyperactivity disorder (ADHD) in children: a systematic review and meta-analysis. Cureus 2024;16(10):e71527.
25. Jogi MS, Dar IM, Gurgani S. Perinatal asphyxia & attention deficit hyperactivity disorder, a retrospective observational study. J Psychiatry Behav Sci 2024; 7(1): 1090.
26. Hadzic E, Sinanovic O, Memisevic H. Is bacterial meningitis a risk factor for developing attention deficit hyperactivity disorder. Isr J Psychiatry 2017;54(2):54-57.
27. Ekhator OC, Orish FC, Nnadi EO, Ogaji DS, Isuman S, Orisakwe OE. Impact of black soot emissions on public health in Niger Delta, Nigeria: understanding the severity of the problem. Inhal Toxicol 2024; 36(5): 314–326.
28. Howard CC. Temporal analysis and prediction of air quality index for atmospheric pollutants in Port Harcourt, Rivers State . World Scientific News 2025;204: 311-327.
29. Martin J. Why are females less likely to be diagnosed with ADHD in childhood than males? Lancet Psychiatry 2024; 11(4): 303–310.
30. Ambuabunos EA, Ofovwe EG, Ibadin MO. Community survey of attention-deficit/hyperactivity disorder among primary school pupils in Benin City, Nigeria. Ann Afr Med 2011; 10(2): 91–96.
31. Ayano G, Yohannes K, Abraha M. Epidemiology of attention-deficit/hyperactivity disorder (ADHD) in children and adolescents in Africa: a systematic review and meta-analysis. Ann Gen Psychiatry 2020;19:21.
32. Faraone SV, Larsson H. Genetics of attention deficit hyperactivity disorder. Mol Psychiatry 2019; 24(4): 562–575.
33. Hatch B, Healey DM, Halperin JM. Associations between birth weight and attention-deficit/hyperactivity disorder symptom severity: indirect effects via primary neuropsychological functions. J Child Psychol Psychiatry 2014;55(4):384-392.
34. Usman F, Imam A, Farouk ZL, Dayyabu AL. Newborn mortality in sub-saharan africa: Why is perinatal asphyxia still a major cause? Ann Glob Health 2019;85(1):112.