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Prevalence of Hyperkinetic Behaviour among Inclusive Primary School Children in Osun State

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Abstract
Hyperkinetic Behavior (HKB) is one of the maladjusted behaviors commonly exhibited by pupils in primary schools. Experiences have shown that a child manifesting HKB is capable enough of significantly disorganizing the setting of a whole school, let alone a classroom. Environmental stressors have been identified as either the primary causes of HKB or as secondary triggers of biological and genetic factors. The need to know the prevalence of this disorder in inclusive classroom settings cannot be overemphasized. Hence, this study determined the prevalence of HKB among primary school pupils in Osun State, Nigeria. Standardized rating scale on HKB was used to elicit information on levels and extent of symptoms of HKB as manifested by the pupils. One hundred and eighteen pupils and five teachers were recruited into the study. The data collected were subjected to descriptive statistics using frequency counts and percentages. Findings revealed that 5.9% of the pupils manifested severe level of HKB, while 42.4% and 51.7% exhibited moderate and mild levels of HKB respectively. Nearly one in ten male participants (9.4%) manifested severe level of HKB as compared with 1.9% of female manifesting same. Fifty-six percent (56%) of male participants and 46.3% of female participants had moderate level of HKB respectively. It was also observed that 49.1%, 44.3% and 6.6% who presented mild, moderate and severe levels of HKB respectively were within the age range of 8 -10 while 75%, 25% and 0.0% of the same groups were within the age bracket of 11-13. The study has therefore provided previously unavailable data on the prevalence of HKB among pupils in primary schools in Osun State as well as the socio-demographic determinants of its severity. Early identification and management of children presenting this behaviour is imperative in order for them to reach their full potential and to succeed by having a good quality of life marked with maturity and confidence.

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Keywords: Prevalence, Hyperkinetic Behaviour, Inclusive Primary School.

1.0. Introduction

Hyper-kinetic behaviour is a neurodevelopmental disorder defined by impairing levels of inattention, disorganisation, and/or hyperactivity-impulsivity. (Diagnostic and Statistical Manual of Mental disorders, 5th edition – American Psychiatric Association [APA], 2013). It is also defined as a 'neurological condition that involves problems with inattention and hyperactivity-impulsivity that are developmentally inconsistent with the age of the child'. (U.S. Dept. of Education, 2006). According to this submission, Hyperkinetic behaviour (HKB), also known as Attention Deficit Hyperactivity Disorder (ADHD) is not a disorder of attention but a function of developmental failure in the brain circuitry that monitors inhibition and self-control. There is what is called "loss of self-regulation" which impairs other important brain functions crucial for maintaining attention, including the ability to defer immediate rewards for later gain. Cameron and Hill (1996) confirmed. that there are "diagnostically three main groups of symptomatology" and these are overactivity, inattentiveness and impulsivity. Hyperkinetic behaviour may therefore be categorized broadly as Inattentiveness, Hyperactivity/Impulsivity, and Combined. Children with HKB pay the price for their problems in low grades, scolding and punishment, teasing from peers, and low self-esteem. (Center for Mental Health in Schools at UCLA, 2015).

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Researches have shown that two-thirds of children diagnosed with HKB have at least one additional mental-health or learning disorder. Some of the common coexisting conditions are oppositional defiant disorder, learning and language disabilities, and anxiety and depressive disorders. Others are conduct disorder, bipolar disorder and Tourette's Disorder. (ParentsMedGuide.org, 2007, Cameron *et al.*, 1996).

Diagnostic criteria have been specified by various bodies to identify individuals with ADHD. According to the American Psychiatric Association, certain patterns must be demonstrated by a child before he can be confirmed to have the disorder. These criteria intended to standardise clinical definitions to determine the presence of ADHD were set forth in the fourth edition of the Diagnosis and Statistical Manual of Mental Disorders (DSM-IV) and further revised in the fifth edition (DSM-5, 2013). Before ADHD can be clinically diagnosed, it is required that six or more of the symptoms/signs should have persisted for at least six months to a degree that is inconsistent with developmental level and that negatively impacts directly on social and academic activities of the child. (APA, DSM-5, 2013). There are minor differences between DSM-IV and DSM-5 In DSM-5, several inattentive or hyperactive-impulsivity symptoms were present prior to age 12 years, whereas DSM-IV recorded that some hyperactive-impulsive or inattentive symptoms that caused impairment were present before age 7 years. Also DSM-5 stated the presence of several inattentive or hyperactive-impulsive symptoms in two or more settings (e.g., at home, school, or work; with friends or relatives; in other activities). However, Barkley (2015) averred that there is no empirical basis for requiring reports from multiple informants to support a diagnosis of ADHD. The basic diagnostic scheme generally adopted for ADHD is shown in figure 1.

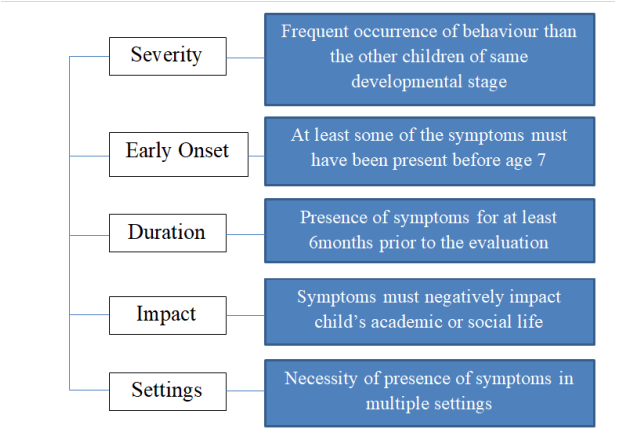


Figure 1: Diagnostic Scheme for ADHD

Studies have confirmed that the exact causative mechanisms of Hyperkinetic disorder are not known but many researchers are convinced with evidence from several sources that there is not just one single cause of HKB; it is said to be almost certainly the result of a combination of factors which will vary from child to child. (NIMH 2004, Cameron and Hill 1996, Weston 2004, Coghill and Sonuga-Barke 2013).

Weston (2004) confirmed that the disorder is known to run in families and estimated that between 10% and 35% of children with HKB have a first-degree relative with past or present HKB. She reported further that higher rates of the disorder have been found in children with exposure to cigarettes and alcohol in the uterus, low birth weight, exposure to lead, and brain injuries occurring also in the uterus. Nagui (2009), states that HKB runs in families which suggests inheritance as an important risk factor. She corroborates the findings of Weston on estimated percentage of inheritability of the disorder and also that approximately one-half of parents who had the disorder have a child with the disorder. She confirmed that when HKB is present in one twin, there is the likelihood of the manifestation in an identical twin than in a fraternal twin. The heritability of the disorder is reportedly believed to be one of the highest in the disorders of psychiatry 75-80%.

According to Berk (2011), HKB is associated with environmental factors. She cited prenatal teratogens which affect particularly those involving long-term exposure, such as illegal drugs, alcohol, and cigarettes- these are linked to inattention and hyperactivity. A study found that children of women who were treated for high blood pressure during pregnancy with a medication called labetalol (Normodyne, Trandate) had a significantly higher risk of ADHD. Some medications given to a mother may interfere with fetal oxygen. Cigarette smoke and alcohol have been found to be two toxins that increase the risk of ADHD in children. Nagui (2009) noted that hyperactivity and

inattention are being observed more commonly in children who had mothers that smoked during pregnancy; mothers that had a lack of oxygen in the neonatal period, or mothers that have been exposed to high quantities of lead or mercury. It also found that high level of lead in the bodies of young preschool children may be associated with higher risk of HKB. Lead may enter a child's drinking water through old plumbing fixtures and children may also be exposed from lead paint (IIiades, 2010).

Pesticides, particularly those containing organophosphates, have also been implicated in ADHD in children. It was found that children who had high levels of pesticides in their urine had almost doubled the risk of ADHD as children who had undetectable levels. The US Environmental Protection Agency (EPA) has confirmed that most people's exposure to pesticides comes through food, that is, commercially grown fruit and vegetables, drinking water, and residential pesticide use (Haddad, 2018).

Other causes that have been identified include: low birth weight, brain disease and injuries, food additives, sugar (both refined sugar and sugar substitutes), yeast, food intolerance or food allergies, food additives such as food colouring or food preservatives, fluoride, complications during pregnancy, including high blood pressure, bleeding before the birth of the baby, babies who remain in the womb beyond their due date, long delivery time, and anything that impacts the baby's oxygen supply during birth. Social trauma and marital conflicts also may precipitate HKB in predisposed children. These include "a sudden change in the child's life-the death of a parent or grandparent, parents' divorce, a parent's job loss, undetected seizures, a middle ear infection that causes intermittent hearing problems, medical disorders that may affect brain functioning, underachievement caused by learning disability, anxiety or depression."

According to DSM-5 (2013), prevalence surveys suggest that ADHD occurs in most cultures in about 5% of children and about 2.5% of adults. It is more frequent in males than in females in the general population, with a ratio of approximately 2:1 in children and 1.6:1 in adults. Also, females are more likely than males to present primarily with inattentive features. Cameron *et al.*. (1996) cited Taylor and Hemsley (1995) as suggesting an overall prevalence of 0.5 – 1.0% of all prepubertal children. Center for Mental Health in Schools in UCLA (2015) stated that it has been estimated that 3.5% of children truly have one form of HKB, yet some schools have a much greater percentage age with a diagnosis. It was recorded by Nagui (2009) in her statistical breakdown of the disorder, that the U.S. Surgeon on Mental Health in 1999 put the percent of school-aged children with HKB at 3 – 5%. NIMH in 2001 stated an estimated 4.1% of youths between the ages of 9 and 17 years affected by HKB while the Mayo clinic studies used a figure of 7.5% and the American Academy of Pediatrics in their reviewed epidemiological studies showed prevalence rates in the range of 4 – 12% respectively in 2001. She also cited a review of over 9000 studies and surveys between the years 1978 and 2005 which estimated a pooled prevalence rate of 5.23%; and another pooled estimate of 71 studies between 1997 and 2007 which found the prevalence to vary between 0.9 – 27%. The review of ADHD in sub-Saharan Africa reported a prevalence range of 5.4% to 8.7% by Bakare (2012) while Chinawa J.M., & Obu H.A., (2015) confirmed the latest prevalence in Nigeria is 3.2%. Different methods of survey and diagnosis were reportedly accountable for most of the variability. Furthermore, the currently accepted rate was given at the rate of about 5 – 10% with boys more likely to have the illness at the rate of 2.4 -4 times than girls. According to O'Brien and Christner (2013), school and office based surveys are somewhat lower.

2.0. Materials and Methods

The To conduct this study, a research proposal was submitted to the Health Research Ethics Committee (HREC) Obafemi Awolowo University in charge of the protection of Human Subjects for ethic approval in accordance with Helsinki declaration. The study was given approval after full review of the committee. Furthermore, three letters requesting for enrolment data for public primary schools, list of primary schools in Osun State and permission to conduct research were submitted to State Universal Basic Education Board, (SUBEB) and State of Osun Ministry of Education through the Permanent Secretaries respectively.

2.1. Study Population

The Study Population comprised of all public primary school pupils and teachers in Osun State. One Local government area was purposively selected from each of the three senatorial districts in the state: Osun Central, Osun East and Osun West. From these, one school was randomly selected and two intact classes of primary three pupils also randomly selected from each school. Primary three was purposively selected because the pupils at this level are between the ages of six and nine year's old which fall within the age of symptom manifestation of hyperkinetic behaviour based on DSM-IV criteria (2003).

A sample of 118 pupils and 5 teachers were selected for the study. Although the study was carried out in intact classes, the teachers were required to complete two different types of rating scales for each pupil for the purpose of identifying the levels at which the behaviour was being manifested by each pupil. The data generated through the rating scales were utilised for carrying out the direct observations on the pupils in the classroom and on the playing ground as well as small group and individual sessions.

2.2. Research Instrument

A research instrument in form of questionnaires 'Hyperkinetic Behaviour Rating Scale' (HBRS), The rating scale which serve as diagnostic instrument was a teachers'- administered instrument responded to by the teachers for each pupil based on their observation of and interaction with the pupils to rate them on their levels of manifestation of hyperkinetic behaviour. The HBRS, linked directly to DSM-IV/V and ICD-10 diagnostic criteria for ADHD was adapted from Canadian ADHD Resource Alliance (2014), Vanderbilt (1998), and ADHD Rating Scale-IV (1998) by DuPaul J.G., Power J.T., Anastopoulos D.A., and Raid R.

The HBRS was used to elicit information on levels and extent of symptoms of hyperkinetic behaviour as manifested among pupils. It is made up of two sections. Section 'A' addressed the pupil's personal information. These are, sex, age as at last birthday, class, number on roll, that is, number of pupils in the class and serial number of pupil on attendance register. Section 'B' of the instrument comprised of 22 items adapted and modified from the 18 items in the original rating scale. The original expressions which were observed to be ambiguous or not explicit enough were modified and corrected. The scale measured inattention which required six or more counted behaviours from questions 1-11 for indication of the predominantly inattentive type; hyperactivity/impulsivity required six or more counted behaviours from question 12-22 for indication of the predominantly hyperactive/impulsive subtype and six or more counted behaviours on both the inattention and hyperactivity/impulsive dimensions for the combined subtype. Under this section, the respondents were asked to rate the items on the scale using a 4-Point-Likert rating scale ranging from Never to Very Often. The items were scored as follows: (1) Never (2) Occasionally (3) Often and (4) Very Often. High score indicated pupils with high level of hyperkinetic behaviour.

The instrument was trial-tested among 46 primary school children that were not part of or selected for the final sample of the study. The primary school children were observed and the rating scale was used to record the various observations as measured by the various items contained in each section of the rating scales. This was aimed at ascertaining the appropriateness of the items as well as detecting ambiguity if any in the items so as to ensure the reliability and validity of the rating scales. The KMO and BTS tests were carried out to ascertain the usability of factorial validation for the validation of the items in each section of the rating scales and if each item will yield uniform data. The KMO value for each of the sections was greater than critical value at 0.05 level of significance and so is acceptable. The significant value for BTS showed that the correlation matrices are not identity matrices and hence it was concluded that factorial validity was appropriate for construct validation of the scales and that the items are uniform enough to yield distinct factors. Hence, there was no need to consider eliminating any item of the rating scales. Thus in line with the recommendation of Wilberg (2004), each item of the rating scales is valid enough for measuring what each section was designed to measure. The Cronbach's Alpha approach was adopted in determining the reliability of the rating scales and yielded 0.927 for the hyperkinetic behaviour rating scale. In all, the rating scales were responded to for 118 pupils in the selected intact classes.

3.0. Results

The hyperkinetic behaviour items were scored in such a way that when a respondent indicated "Often", the respondent was scored 4, while those who indicated "Occasionally", "Rarely", and "Never" were scored "3", "2" and "1" respectively. The resulting scores were added up to build a measure of hyperkinetic behaviour (pre-test scores) and subjected to descriptive statistics. The results are presented in Table 1.

As shown in Table 1, the minimum and maximum score of participants on hyperkinetic behaviours are 22 and 79 respectively. The results also revealed the mean and standard deviation of 44.63 and 14.57 respectively. To determine the prevalence of hyperkinetic behaviours among participants, scores of participants on hyperkinetic behaviours (pre-test) were categorised into three (Mild, Moderate and Severe) levels of hyperkinetic behaviours. Those who had scores between twenty-two to forty-three (22-43) were categorised as exhibiting mild level of hyperkinetic behaviour, those who had scores that are within 44 – 65 points were considered as manifesting moderate level of hyperkinetic behaviour, while scores that are within 66 – 79 points were categorised as demonstrating severe level of hyperkinetic behaviour. The result is presented in Table 2.

Table 1: Descriptive statistics of participants' scores on hyperkinetic behaviour

Descriptive Statistics	*N*
Number of participants	118
Range	57.00
Mean score	44.63
Standard Deviation	14.57
Minimum score	22.00
Maximum score	79.00

Source: Author's Analysis, 2020

Table 2: level of hyperkinetic behaviour

Level of hyperkinetic behaviour	*Frequency*	*%*
Mild	61	51.7
Moderate	50	42.4
Severe	7	5.9
Total	**118**	**100.0**

Source: Author's Analysis, 2020

As shown in Table 2, a total of 118 participants were pre-tested for level of hyperkinetic behaviour. It was observed that 61 (51.7%) of participants demonstrated mild level of hyperkinetic behaviour; 50 (42.4%) of the participants demonstrated moderate level of hyperkinetic behaviour; while 7 (5.9%) exhibited severe level of hyperkinetic behaviour. Hence, it can be concluded that the level of hyperkinetic behaviour of majority of the participants is mild with a relatively high number demonstrating moderate level of hyperkinetic behaviour while few demonstrated a severe level of hyperkinetic behaviour.

Moreover, the results on levels of hyperkinetic behaviours among pupils was cross-tabulated with respect to participants' demographic variables (sex and age) and were subjected to descriptive statistics using frequency counts and percentages. The results are presented in Table 3.

Table 3: Prevalence of hyperkinetic behaviour across participants' socio-demographic variables

Variable	Level of hyperkinetic behaviour				χ^2	P-value
	Mild	**Moderate**	**Severe**	**Total**		
Sex						
Male	36 (59%)	22 (34.4%)	6 (9.4)%	64 (54.2%)	5.467	0.065*
Female	25 (46.3%)	28 (51.9%)	1 (1.9)%	54 (45.8%)		
Age						
8-10 years	52 (49.1%)	47 (44.3%)	7(6.6%)	106(89.8%)		
11-13 years	9 (75.0%)	3 (25%)	0 (0.0%)	12 (10.2%)	3.147	0.207*

***Not significant (>0.05)** *Source: Author's Analysis, 2020*

From Table 3, it was observed that 36 (59%) of male participants and 25 (46.3%) of female participants were found to have a mild level of hyperkinetic behaviour. While 22(34.4%) and 28 (51.9%) of male and female participants had moderate level of hyperkinetic behaviour respectively. However, 6 (9.4%) and 1 (1.9%) of male and female participants had severe level of hyperkinetic behaviour. With these figures, it is concluded that hyperkinetic behaviour was more severe among males than female pupils; and considering the moderate and severe levels, hyperkinetic behaviour was more prevalent among female than male pupils.

Moreover, it was also observed that 52 (49.1%), 47 (44.3%) and 7 (6.6%) of participants who manifested mild, moderate and severe levels of hyperkinetic behaviour respectively were within the age range of 8-10. While 9 (75%), 3 (25%) and 0 (0.0%) of participants that manifested mild, moderate and severe level of hyperkinetic behaviour were found within the age bracket of 11-13. With these figures, considering the moderate and severe

levels, it is concluded that hyperkinetic behaviour was more prevalent among participants within the age range of 8-10 than within the age range of 11-13. The implication of these figures is that hyperkinetic behaviour was more prevalent among relatively younger pupils.

Conclusion and Recommendations

This study has provided data on the prevalence of hyperkinetic behaviour as well as the gender at risk of severity for the stakeholders in early childhood education in Osun state, Nigeria. There is need to engage teachers in literacy interventions in order to improve their knowledge and literacy about hyperkinetic behaviour among school children through educational workshops/seminars, in-service trainings for early identification, management, referral and follow-up. We also recommend that Mental Health/ADHD education should be integrated into the curriculum of regular teachers' training as opposed to only special education, for them to be able to teach and manage children with ADHD

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