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Prevalence of Attention Deficit Hyperactivity Disorder Among Pupils in Primary Schools in Ghana

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Abstract

In recent times, international deliberations have centered on inaccessibility of essential services to persons with disabilities. These systematic discriminations have accounted for high rates of poverty and deplorable living standards among persons with disabilities. Deliberate attempts are being made to safeguard the rights and well-being of persons with disabilities. In Ghana, one major development is the implementation of inclusive education, to open regular classrooms to children with disabilities. While much is known about the challenges faced by teachers, in terms of lacking skills, facilities and resources to teach students with disabilities in regular classrooms, little attention has been given to their ability to identify students with disabilities. This case study explored the prevalence, common sub-types and distribution of Attention Deficit Hyperactivity Disorder (ADHD) among pupils in primary schools in Ghana. The school and home version of the ADHD Rating Scale IV were used to

rate 374 pupils by their teachers and parents. Cluster sampling was used to select 15 schools from a district to take part in this study. The estimated prevalence of ADHD was 7% and more boys were identified with ADHD than girls. With regards to teachers' ratings, most of the pupils fell under inattentive sub-type while hyperactive was the most common sub-type identified by parents. Both teachers and parents identified twenty-one pupils. The need for stakeholders' engagement on public education on ADHD its symptoms and management, have been discussed extensively.

Key Words: ADHD, parents, teachers, Ghana, inclusive education

In recent times, international discussions on disability issues have centered on capacity building and supporting persons with disabilities to have access to basic services in societies. This paradigm shift has been informed by poor living conditions and the inability of persons with disabilities to have access to services that would improve their lives (Filmer, 2008; Groce, Kett, & Brown, 2010; Mitra, 2010; Opoku, Mprah, Badu, Mckenzie, & Agbenyega, 2017). In response, legislative and legal frameworks have been developed at the international level to serve as guides to countries to reform their systems and guarantee persons with disabilities reasonable standards of living. Ghana has passed Disability Act (Act 715) and ratified the United Nations Convention on the Rights of Persons with Disability (UNCRPD) to promote the well-being of persons with disabilities. For example, one major development is the implementation of inclusive education to open regular classrooms to children with disabilities. This policy calls for educational reforms before all children are given the opportunity to study in one classroom.

In Ghana, inclusive education was incorporated into the education system during the 2003/4 academic year. With support from international development partners, the government of Ghana, through the Special Education Division (a division in charge of disability education) has piloted inclusive education in selected schools in some districts (Anthony, 2011). In an effort to achieve the policy goal, sensitization programs, reformation of teacher education program and policy instruments have been developed to guarantee access to education to all children. Despite the development of inclusive policy and an implementation plan, empirical evidence have found inconsistencies in the implementation of inclusive education (Agbenyega, 2007; Ocloo & Subbey, 2008; Mprah, Opoku, Owusu, Badu & Torgbenu, 2016; Opoku, Badu, Amponteng & Agyei-Okyere, 2015). Consistently, it has been reported that teachers lack skills to teach students with disabilities in regular classrooms as well as inadequate resources to support teaching and learning (Anthony, 2011; Kuyini & Desai, 2007; Mprah, Dwomoh, Opoku, Owusu, & Ampratwum, 2016; Opoku et al., 2015). This development has contributed to their resistance or unpreparedness to teach students with disabilities.

Other studies have reported challenges such as lack of teaching and learning materials, negative societal barriers towards children with disabilities, overcrowded classrooms and lack of infrastructure to support teaching and learning of pupils with disabilities in regular classrooms (Adera & Asimeny-Boahene, 2011; Agbenyega, 2007; Mprah et al., 2015; Opoku et al., 2015; Opoku et al., 2017). While much is known about challenges facing the implementation of inclusive education in Ghana (Alhassan & Abosi, 2014; Gyimah, Sugden & Pearson, 2008; Obeng, 2007), little attention has been given to the capacity of stakeholders, such as teachers and parents, to identify children with special education needs. Given the importance of identification of disabilities and collaboration between stakeholders, this study explored the prevalence, common sub-types and gender distribution of Attention Deficit Hyperactivity Disorder (ADHD) among pupils in primary schools in a Ghanaian district.

Prevalence of ADHD in Schools

ADHD is a neuro-developmental disorder which manifests in persistent behavior patterns among children and continue across the lifespan. It is one of the most common childhood behavioral disorders affecting 3% to 7% of school age pupils (American Psychiatric Association, 2000). There are two major types of ADHD: inattentive and impulsive or hyperactive. Concerning inattentive, Scime and Narvilities (2006) reported that learners with ADHD lack concentration and are unable to cope with activities that require focus and tenacity. Secondly, impulsivity and hyperactivity are most often connected, and the two core symptoms are aversive and disruptive behaviours (Graczyk et al., 2005). For example, impulsivity demonstrates in unplanned reaction to individuals or events and results in poor planning and organization (Moonsamy, Greenop, & Jordaan, 2009). Similarly, hyperactivity refers to excessive and immature motor activity which is highly inappropriate (Antrop, Buysse, Roeyers, & Van Oost, 2005). These behaviors may have an impact on the development of children.

Several studies have documented the increasing prevalence of ADHD and its adverse impact on the development of children and social relationships (Bozkurt, Dirik, & Üneri, 2017; Kos, Richdale, & Hay, 2006;

Mpango et al., 2017; Wang et al., 2017). For instance, learners with ADHD shift attention away from an assigned task as they tend to focus on tasks which may provide them instant gratification (Moonsamy et al., 2009). In the classroom, they are unable to pay attention due to poor organizational ability (Anhalt, McNeil, & Bahl, 1998; DuPaul, Weyandt, & Janusis, 2011; Kos et al., 2006) which culminates in poor academic performance (DuPaul et al., 2011; Harris, Friedlander, Saddler, Frizelle, & Graham, 2005). The adverse effects of ADHD on academic performance underscores the need for policy makers in Ghana to be interested in ADHD issues and train educators on early recognition, assessment and management.

ADHD is often misunderstood and identification remains a problem (Brown, 2007; Figerio, Montali, & Marzocchi, 2014). Many studies have documented that training improves teachers' knowledge about ADHD and puts them in a better position to assist in behavioral management and teaching of pupils with ADHD in regular classrooms (Anderson, Watt, & Shawley, 2017; Stampoltzis, & Antonopoulou, 2013; Youssef, Hutchinson, & Yousseff, 2015). However, empirical studies have reported that teachers lack knowledge about ADHD (Guerra & Brown, 2015; Shroff, Hardiker-Sawant, & Prabhudesai, 2017; Topkin, Roman, & Mwaba, 2015; Perold, Louw, & Kleynhens, 2010) and are unprepared to support pupils with ADHD in regular classrooms (Al-Omani, Al-Motlaq, & Al-Modallal, 2015). Additionally, it has been found that boys are more likely to be diagnosed with ADHD than girls (Ademuya & Famuyiwa, 2007; Afeti & Nyarko, 2017; Ndukuba, Odinka, Muomah, Obindo, & Omigbodun, 2017; Vasillias et al., 2017; Wang et al., 2017). However, there is tension in the literature regarding the age at which most children are diagnosed with ADHD as well as the most common ADHD sub-type among pupils. In Ghana, Afeti and Nyarko (2017) reported that ADHD is prevalent among pupils between the ages of 8 and 10 years and the most common sub-type was impulsive. In Taiwan, Wang et al. (2017) reported that ADHD was prevalent among pupils between 7 and 12 years. While the most common sub-type of ADHD was combined sub-type in Cypriot study (Bozkurt et al., 2017) and rural Nigerian study (Ndukuba et al., 2014), inattentive sub-type emerged as common sub-type of ADHD in an urban Nigerian (Ademuya & Famuyiwa, 2007) and Ugandan studies (Mpango et al., 2017). The disparities between countries provide impetus for further studies to broaden understanding of ADHD and its complexities.

Unfortunately, in most of these studies, no training was provided to participants who rated the pupils. Also, most authors relied on the account of one group (e.g. teachers or health professionals) to rate children based on their understanding and perceptions. These limitations could affect the credibility of results reported in the literature. Therefore, this study intended to fill the gap in the literature and explored the prevalence and presentations of ADHD, using ratings by both teachers and parents.

METHOD

Setting and Participants

Ghana is divided into 10 administrative regions and for the purpose of this study, the Asante Akyem district which is located in Ashanti region was conveniently chosen for this study. According to Ghana Statistical Service (2012), an estimated population of 68,186 inhabitants lived in 15 towns in the district. The population for this study was pupils from public primary schools, teachers and parents. The researchers grouped all schools into four clusters, and based on convenience and proximity 15 schools were selected for this study. Five schools were selected from cluster A and B, two schools from cluster C and three schools from cluster D. Teachers from all the 15 participating schools were invited to a training programme on ADHD. Out of nearly 200 teachers teaching in the participating schools, 90 accepted the invitation and participated in the workshop. After the training of teachers, pupils were given letters to be given to their parents requesting permission to rate their children for the study. Out of over 800 parents who were sent letters, 450 parents approved the participation of their children. When invitations were given to the 450 parents to attend a workshop on ADHD, only 374 parents honored the invitation. Pupils whose parents participated in the training programme were included in the study.

Table 1 presents the demographic characteristics of participants. A total of 90 (19%) teachers and 374 (81%) parents took part in this study. The age distribution of the pupils ranged from 6 to 14 years as per their classes from 1 to 6 in the Public Basic Schools. With regards to the 90 teachers, the majority were females (57%), most of them were between 31-40 years (46%), and over 40% had worked between 6-10 years. In terms of qualification, nearly 70% had diploma qualification compared to 31% who had a Bachelor degree. On parents, 241 (64%) were females while 133 (36%) were males. In terms of employment, most of them were farmers while 7% were unemployed. On age, most of parents were between 31-40 years (43%) compared to 20% who were between 41-50 years.

Study Design

This study reports phase one of a study assessing the teaching of pupils with ADHD in regular classrooms. A case study method was adopted to explore teachers and parents' perspectives about the prevalence of ADHD in primary schools. According to Creswell, Hanson, Clark Plano, and Morales, (2007) and Yin (2003), case study research is appropriate to understand community-

based problem and understanding of perspectives of different stakeholder groups. The design was appropriate for this study since we want to understand perspectives of different stakeholder groups within a community.

Materials

The school and home version of the ADHD Rating Scale IV were used for this study (DuPaul, Power, Ananstopoulos, & Reid, 1998). The items on the scale reflect the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) used to diagnose ADHD. The scales have adequate psychometric properties to measure screening, diagnostic, and treatment outcome measures of ADHD. It has proven to be universally applicable and has been used in different contexts with appropriate internal consistencies reported. For instance, Ndukuba et al. (2017) reported internal consistency of 0.89 for the school version and 0.88 for the home version. There were 18 ADHD symptoms corresponding to 18 criteria in the DSM-IV-TR (9 Inattention and 9 Hyperactive/Impulsive items). The scale is made up of 4-points, ranging from *never (0), rarely (1), occasionally (2) and very often (3)*. Higher scores are indicative of greater ADHD-related behavior. Color codes were used to highlight the symptoms to give clarity to the respondents. Demographic information on age and gender in the various classes was noted. The first and second authors were instructors for the workshops organized for parents and teachers. Teachers selected symptoms that best described the specific behavior displayed by pupils, while parents were assisted to respond to the questionnaire.

Procedures

The data collection was carried out between February 2014 and June 2015. The Committee on Human Research Publication and Ethics at Kwame Nkrumah University of Science and Technology approved the protocol for this case study. After the approval, permission was obtained from Education Directors in Ashanti Region and Asante Akyem North district. Subsequently, permission was obtained from head-teachers to allow their schools to participate in this study. Then, teachers were invited to workshop on ADHD that was facilitated by the first and third authors. During the workshop, they were taken through various symptoms of ADHD and ways to manage behaviors in classrooms. All teachers were given letters to be given to pupils to send to their parents. The letters were informing parents about the study and asked permission to rate their children, and they were given a week to give teachers a written or verbal response. After the week, teachers prepared a list of all pupils whose parents agreed for them to be rated. Each student was assigned a code and teachers were given questionnaires to rate pupils. They were given a month to perform this exercise. After receiving all questionnaires from teachers, parents were invited to a day's workshop on ADHD at various schools. Fifteen different workshops were organized for parents and they rated their children after the workshop.

Table 1
Demographic characteristics of participants

Variable	Frequency	Percentage (%)
Teachers (n=90)		
Gender		
Female	51	57
Male	49	43
Age		
21-30	25	28
31-40	41	46
41-50	24	27
Qualification		
Diploma	62	69
Degree	28	31
Masters	-	-
Years of working experience		
1-5 years	17	19
6-10 years	37	41
11-15 years	22	24
<16 years	14	16
Parents (n=374)		
Gender		
Male	133	36
Female	241	64
Employment		
Apprentice	45	12
Public servant	85	23
Traders	59	16
Farmers	160	43
Unemployed	25	7
Age		
21-30	138	37
31-40	160	43
41-50	76	20
Educational level		
Uneducated	196	52.4
Primary	101	27
Secondary	61	16.3
Bachelor	16	4.3
Masters	-	-
Other	-	-

Table 2
ADHD Case Ratings by Teachers and Parents

Pupils (n=374)	Teacher-Only Rating	Parent-Only Rating
ADHD cases identified	127 (30%)	76 (20%)
Asymptomatic	247 (70%)	298 (80%)
Overall prevalence (7%)		
ADHD sub-types		
Inattentive	86 (68%)	26 (34%)
Hyperactivity/impulsive	26 (20%)	44 (58%)
Combined	15 (12%)	6 (8%)

Data Analysis

The questionnaires were first entered into a Microsoft Excel spreadsheet for sorting and crosschecking before it was exported to SPSS (version 21) for analysis. This study was part of a larger study so results were presented as numbers and percentages. Descriptive statistics were computed to report demographic variables and survey questionnaires. All assumptions underlying inferential statistics were not satisfied and thus, the research team decided to report descriptive data. For example, there was violation of assumption of normality as the data was skewed. Percentages and ratios were computed to describe the prevalence of ADHD, age, gender and subtypes. These were presented in tables for easy interpretation. A diagnosis of ADHD is made in the event parents or teachers reported six or more symptoms for a pupil. The percentages were compared between both groups.

RESULTS

ADHD Ratings by Participants

Table 2 presents ratings by both parents and teachers. The estimated prevalence of ADHD was 7%. Teachers identified most cases of ADHD compared to parents. Out of 374 pupils, teachers rated 34% as having one sub-type or another of ADHD while parents rated 20% of pupils. While inattentive (68%) was found to be the most common sub-type among pupils identified by teachers, hyperactive (58%) was found to be common in the ratings by parents. Combined was the least sub-type identified by both teachers (12%) and parents (8%).

Distribution of ADHD Among Pupils

Table 3 presents the detailed distribution of ADHD among pupils. Fifty-five percent (55%) of the pupils selected for this study were boys compared to 45% who were girls. Out of 127 pupils identified by teachers with ADHD, 57% were boys compared to 43% who were girls. Similarly, out of 76 pupils identified by parents, 80% were boys compared to 20% who were girls. Most pupils rated by both teachers and parents (21%) were in Primary 2 compared to 13% who were in Primary 4. According to the

Table 3
Distribution of ADHD among pupils

		Teachers rating		Parents rating	
Pupils	Frequency (%)	+ADHD (n=127)	-ADHD (n=247)	+ADHD (n=76)	-ADHD (n=298)
Gender					
Boys	205 (55%)	73 (57%)	132 (53%)	61 (80%)	144 (48%)
Girls	169 (45%)	54 (43%)	115 (47%)	15 (20%)	154 (52%)
Classes					
Primary 1	66 (17.6%)	17 (13%)	49 (20%)	5 (7%)	61 (20%)
Primary 2	78 (21%)	24 (19%)	54 (18%)	11 (14%)	67 (22%)
Primary 3	54 (14.4%)	18 (14%)	36 (15%)	17 (22%)	37 (12%)
Primary 4	48 (13%)	27 (21%)	21 (9%)	12 (16%)	36 (12%)
Primary 5	68 (18%)	12 (9%)	56 (23%)	16 (21%)	52 (17%)
Primary 6	60 (16%)	29 (23%)	31 (13%)	15 (20%)	45 (15%)
Age					
4-6	51 (14%)	19 (15%)	32 (13%)	20 (26%)	31 (11%)
7-9	169 (45%)	72 (57%)	97 (39%)	28 (37%)	141 (47%)
10-12	81 (21.7%)	27 (21%)	54 (22%)	15 (20%)	66 (22%)
13-15	73 (19.5)	9 (7%)	64 (26%)	13 (17%)	60 (20%)

+ ADHD means identification of ADHD symptom - ADHD means no ADHD symptom

Table 4
Distribution of ADHD sub-types

	Teachers rating			Parents rating		
Pupils	Inattentive (n=86)	Hyperactivity (n=26)	Combined (n=15)	Inattentive (n=26)	Hyperactivity (n=44)	Combined (n=6)
Gender						
Boys	57 (66%)	6 (23%)	7 (47%)	14 (54%)	31 (70%)	4 (67%)
Girls	29 (34%)	20 (77%)	8 (53%)	12 (46%)	13 (30%)	2 (33%)
Classes						
Primary 1	4 (5%)	8 (31%)	5 (33%)	1 (4%)	4 (9%)	-
Primary 2	21 (24%)	3 (12%)	3 (20)	3 (12%)	8 (18%)	1 (17%)
Primary 3	11 (13%)	7 (27%)	1 (7%)	12 (46%)	5 (11%)	2 (33%)
Primary 4	20 (23%)	1 (4%)	4 (27%)	2 (8%)	10 (23%)	-
Primary 5	11 (13%)	2 (8%)	2 (13%)	4 (15%)	6 (14%)	-
Primary 6	19 (22%)	5 (19%)	-	4 (15%)	11 (25%)	3 (50%)
Age						
4-6	12 (14%)	7 (27%)	4 (27%)	6 (23%)	14 (32%)	-
7-9	56 (65%)	6 (23%)	1 (7%)	4 (15%)	18 (41%)	2 (33%)
10-12	14 (16%)	8 (31%)	9 (60%)	9 (35%)	6 (14%)	3 (50%)
13-15	4 (5%)	5 (19%)	1 (7%)	7 (27%)	6 (14%)	1 (17%)

teachers, many pupils identified with ADHD were in Primary 6 (23%), followed by Primary 4 (21%) and Primary 2 (19%) respectively. However, the ratings by parents found that most pupils identified were in Primary 3 (22%); primary 5 (21%) and Primary 6 (20%) respectively. In terms of age, most pupils who were rated were between 7-9 years (45%) while the least were rated in Primary 1 (14%). Most pupils identified by teachers with a form of ADHD were between 7-9 years (57%) while the least were between 13-15 years (7%). With regards to parents' ratings, most pupils identified with ADHD were between 7-9 years (37%) while the least were between 13-15 years (17%).

Distribution of ADHD sub-Types

Generally, the number of boys (57%) identified with ADHD were more than girls (43%). However, there were differences between the various sub-types. For instance, under inattentive sub-type, 66% of pupils rated by teachers were boys compared to 34% who were girls. Conversely, more girls were rated higher under both hyperactivity (77%) and combined sub-types (53%) than boys. Additionally, parents rated boys higher under each of the three sub-types (for example, inattentive – boys: 54%; girls 46%). With regards to class, under inattentive sub-type, more pupils were identified by teachers in Primary 2 (24%). However, under both hyperactivity and combined sub-types, teachers in Primary 1 class identified many pupils. Also, parents identified many pupils under inattentive sub-type in Primary 3 (46%). Again, under hyperactivity and combined sub-types, most pupils rated by parents were in Primary 6. On age, under inattentive, many pupils identified by teachers were between 7-9 years (65%). Under both hyperactivity and combined sub-types, many pupils identified by teachers were between 10-12 years. On parents' ratings, under inattentive sub-type, many pupils (35%) were between 10-12 years. On hyperactivity, many pupils rated by parents were between 7-9 years. Also, under combined sub-type, most of the pupils were between 10-12 years (50%). See Table 4 for details.

Matched Pairs between Teachers And Parents

Table 5 shows the matched pairs identified by both teachers and parents. Twenty-one pupils were identified by both parents and teachers. Fourteen of these pupils were boys while remaining seven were girls. Ten of the pupils were identified under combined sub-type; seven were rated under inattentive while four were rated under hyperactive. The peak age for the combined sub-type was 7 years.

DISCUSSION

Inclusive education has become a topical issue in contemporary discourse on equitable access to education for all children. This system appears to be a departure from the traditional system of educating pupils with disabilities in special schools. In Ghana, some parents have enrolled their children with disabilities in regular schools located in

Table 5
ADHD Sub-type

Codes (n=21)	Gender M/F	Age (Years)	Inattentive	Hyperactivity-Impulsive	Combined
2	M	7			X
10	F	7			X
16	M	7			X
17	F	6	X		
40	M	7			X
60	M	11	X		
66	F	12		X	
81	M	9			X
90	F	6	X		
95	M	9			X
100	F	8		X	
102	M	8	X		
111	M	7			X
126	F	11	X		
129	M	7			X
131	F	13	X		
141	M	7			X
153	M	7			X
219	M	10		X	
220	M	6	X		
332	M	14		X	
N=21	M:F 14:7		n1=7	n2=4	n3=10
	Ratio 2:1		(7/21)*100	(4/21)*100	(10/21)*100
			7(33.3%)	4 (19.1%)	10 (47.6%)

their neighborhoods. Although empirical studies have reported inconsistencies and challenges with the implementation of inclusive education in Ghana (Ametepee & Anastasious, 2015; Obeng, 2007; Opoku et al., 2015), deliberations have not been extended to the capacity of teachers and parents to identify pupils with disabilities. Thus, this study explored the prevalence of ADHD among pupils in selected primary schools in Ghana.

This study found that both parents and teachers were able to rate some pupils under one of the sub-types of ADHD. Consistently, it has been reported that ADHD is prevalent among children (Ndukuba et al., 2014; Vasillias et al., 2017; Wang et al., 2017) which has influenced discourses on training of teachers to manage behaviours in classrooms. Unsurprisingly, teachers and parents who participated in this study were able to identify ADHD among the selected pupils. Since most teachers were educated and parents spend more time with their children, they were in a better position to rate pupils based on their behaviours. Interestingly, the estimated prevalence was 7% which falls within the projected 3% to 7% prevalence of ADHD by American Psychiatric Association (2000). This finding underscores the importance of training programmes for teachers in order to improve knowledge, identification and management of ADHD (Anderson et al., 2017; Youssef et al., 2015).

Several studies have reported that boys are more likely to be diagnosed with ADHD than girls. This study confirmed this finding as both teachers and parents identified more boys with ADHD than girls. However, a major departure from previous studies is that teachers identified more girls than boys under hyperactivity and combined sub-types of ADHD. This finding is inconsistent with previous studies by Ademuya and Famuyiwa (2007), Afeti and Nyarko (2017), Ndukuba et al. (2014), Vasillias et al. (2017) and Wang et al. (2017) who found higher ADHD prevalence among boys than girls under all the sub-types of ADHD. Probably, there are causative factors which could explain the seemingly changing trends in ADHD prevalence among pupils diagnosed in this study.

There were some differences and similarities concerning the distribution of ADHD among pupils. While teacher ratings found more ADHD cases in Primary 6, parents identified more in Primary 3. While teacher ratings found inattentive to be the most common sub-type of ADHD, parent rating found hyperactivity. While some teachers found high ADHD prevalence in Primary 2, most parents identified more cases of ADHD in Primary 3. Of course, it was only on age that both groups found high prevalence between 7-9 years. This finding corroborates with results of other studies which found inconsistencies in the reporting of ADHD prevalence (Bozkurt et al., 2017; Mpango et al., 2017). For instance, Afeti and Nyarko (2017) found high prevalence of ADHD among primary school pupils while Mpango et al. (2017) found high prevalence of ADHD among adults. Similarly, Afeti and Nyarko (2017) found high prevalence of ADHD between 8-10 years while Wang et al. (2017) reported high prevalence of ADHD between 7-12 years. Thus, the lack of uniformity and disparities between the two groups seem to confirm the complexity surrounding ADHD. Despite the inconsistencies, both groups were able to identify 21 children who were categorized across all three ADHD sub-types.

LIMITATIONS

It is important to mention here that the result of this study ought to be interpreted with extreme caution due to a number of limitations. The study was conducted in selected schools in a district and may not be representative of the study population. Secondly, teachers selected the pupils sampled for this study and there is the possibility of sample bias in the selection process. Thirdly, the authors did not explore the competence of both teachers and parents on ways to manage ADHD. It is recommended that future studies explore the competence of teachers and parents on management of children with ADHD. Despite these limitations, this study has expanded the literature on ADHD and provided rich insight with ratings of pupils by two different groups. Since previous studies usually rely on ratings by single group, this study used of two different groups who were trained before rating pupils. Also, in effort towards practicing inclusive education in Ghana, this appears to be the first time a study has examined the prevalence of ADHD in regular classrooms.

CONCLUSION

This study explored the perspectives of teachers and parents on the prevalence of ADHD in primary schools in Ghana. Both teachers and parents identified ADHD among pupils sampled for this study. With regards to teachers' ratings, most of the pupils fell under inattentive sub-type while hyperactive was the most common sub-type identified by parents. In both ratings, more boys were identified with ADHD than girls. Both parents and teachers identified ADHD among pupils between 7-9 years. Also, when the ratings of parents and teachers were matched, we found that both were able to identify 21 pupils.

Based on the findings, we recommend stakeholders' engagements and development of training programs for teachers and parents on ADHD and its symptoms. Specifically, Ghana Education Service and Ghana Health Service should forge alliances and lead this public education. In addition, we would recommend close collaboration between teachers and parents to enable these stakeholders to share ideas and work together to promote learning of children with ADHD. Although there is the need for professional development for all teachers on ADHD, we are of the view that teachers at lower primary schools should be targeted and trained in identification and management of pupils with ADHD.

REFERENCES

Adera, B. A., & Asimeng-Boahene, L. (2011). The perils and promises of inclusive education in Ghana. *The Journal of the International Association of Special Education*, *12*(1), 28-32.

Adewuya, A. O., & Famuyiwa, O. O. (2007). Attention deficit hyperactivity disorder among Nigerian primary school children: Prevalence and co-morbid conditions. *European Child & Adolescent Psychiatry*, *16*(1), 10-15. DOI 10.1007/s00787-006-0569-9

Afeti, K., & Nyarko, S. H. (2017). Prevalence and effect of attention-deficit/hyperactivity disorder on school performance among primary school pupils in the Hohoe Municipality, Ghana. *Annals of General Psychiatry*, *16*(1), 11. doi 10.1186/s12991-017-0135-5

Agbenyega, J. (2007). Examining teachers' concerns and attitudes to inclusive education in Ghana. *International Journal of Whole Schooling*, *3*(1), 41-56.

Alhassan, A. R. K., & Abosi, O. C. (2014). Teacher effectiveness in adapting instruction to the needs of pupils with learning difficulties in regular primary schools in Ghana. *SAGE Open*, *4*(1), 2158244013518929.

Al-Omari, H., Al-Motlaq, M. A., & Al-Modallal, H. (2015). Knowledge of and attitude towards attention-deficit hyperactivity disorder among primary school teachers in Jordan. *Child Care in Practice, 21*(2), 128-139. doi: 10.1080/13575279.2014.962012

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.

Ametepee, L. K., & Anastasiou, D. (2015). Special and inclusive education in Ghana: Status and progress, challenges and implications. *International Journal of Educational Development*, *41*, 143-152.

Anderson, D. L., Watt, S. E., & Shanley, D. C. (2017). Ambivalent attitudes about teaching children with attention deficit/hyperactivity disorder (ADHD). *Emotional and Behavioral Difficulties, 22*(4), 332-349. doi: 10.1080/13632752.2017.1298242

Anhalt, K., McNeil, C. B., & Bahil, A. B. (1998). The ADHD ZX Classroom Kit; A whole classroom approach for managing disruptive behavior. *Psychology in the Schools, 35* (1), 67-81.

Anthony, J. (2011). Conceptualizing disability in Ghana: Implications for EFA and inclusive education. *International Journal of Inclusive Education*, *15*(10), 1073-1086.

Antrop, I., Buysse A., Roeyers, H., & Van Oost, P. (2005). Activity in children with ADHD during waiting situations in the classroom. A pilot study. *British Journal of Educational Psychology, 75*(1), 51-69.

Bozkurt, Ö. H., Dirik, E., & Üneri, Ö. Ş. (2017). Prevalence of ADHD in Northern Cyprus. *Anatolian Journal of Psychiatry*, 18(5), 478-484. doi: 10.5455/apd.250504

Brown, T.E. (2007). A new approach to Attention Deficit Disorder. *Educational Leadership, 64* (5), 22-27.

Creswell, J. W., Hanson, W. E., Clark Plano, V. L., & Morales, A. (2007). Qualitative research designs: Selection and implementation. *The counselling psychologist, 35*(2), 236-264.

DuPaul, G. J., Power, T. J., Ananstopoulos, A. D., & Reid, R. (1998). *ADHD Rating Scale IV: Checklist, norms and clinical interpretation*. New York, NY: Guildford Press.

DuPaul, G. J., Weyandt, L. L., & Janusis, G. M. (2011). ADHD in the classroom: Effective intervention strategies. *Theory into Practice*, *50*(1), 35-42. doi: 10.1080/00405841.2011.534935

Frigerio, A., Montali, L., & Marzocchi, G. M. (2014). Italian teachers' knowledge and perception of Attention Deficit Hyperactivity Disorder (ADHD). *International Journal of School & Educational Psychology*, *2*(2), 126-136. doi: 10.1080/21683603.2013.878677

Filmer, D. (2008). Disability, poverty, and schooling in developing countries: Results from 14 household surveys. *The World Bank Economic Review*, *22*(1), 141-163.

Ghana Statistical Service (2012). *2010 Population and housing census*. Accra: Ghana Statistical Service.

Gyimah, E. K., Sugden, D., & Pearson, S. (2008). An investigation into the emotional reactions to inclusion of Ghanaian mainstream teachers. *Support for Learning*, *23*(2), 71-79.

Graczyk, P. A., Alkins, M. A., Jackson, M. M., Letender J. A., KIM – Cohen, J. Harris, K. K., Friedlander, B. D., Saddler, B., Frizelle, R. & Graham, S. (2005). Urban educator's perception of interventions for students with attention deficit hyperactivity disorder. *A Primarily Investigation Behavioral Disorder, 30* (2). 95-105.

Groce, N., Kett, M., Lang, R., & Trani, J. F. (2011). Disability and poverty: The need for a more nuanced understanding of implications for development policy and practice. *Third World Quarterly, 32*(8), 1493-1513.

Guerra Jr, F. R., & Brown, M. S. (2012). Teacher knowledge of attention deficit hyperactivity disorder among middle school students in South Texas. *RMLE Online*, *36*(3), 1-7. Doi:10.1080/19404476.2012.11462096

Harris K. K, Friedlander, B. D., Saddler, B., Frizelle, R, & Graham, S. (2005). Self – management of attention versus self – monitoring of academics performance: Effects among students with ADHD in the general education classroom. *The Journal of Special Education, 39*(3), 145-156.

Kos, J. M., Richdale, A. L., & Hay, D. A. (2006). Children with attention deficit hyperactivity disorder and their teachers: A review of the literature. *International Journal of Disability, Development and Education*, *53*(2), 147-160. doi: 10.1080/10349120600716125

Kuyini, A. B., & Desai, I. (2007). Principals' and teachers' attitudes and knowledge of inclusive education as predictors of effective teaching practices in Ghana. *Journal of Research in Special Educational Needs*, *7*(2), 104-113.

Mitra, S. (2010). Disability cash transfers in the context of poverty and unemployment: The case of South Africa. *World Development 38*, 1692-1709. doi:10.1016/j.worlddev.2010.06.014

Mpango, R. S., Kinyanda, E., Rukundo, G. Z., Levin, J., Gadow, K. D., & Patel, V. (2017). Prevalence and correlates for ADHD and relation with social and academic functioning among children and adolescents with HIV/AIDS in Uganda. *BMC Psychiatry*, *17*(1), 336. doi: 10.1186/s12888-017-1488

Mprah, W. K., Opoku, M. P., Owusu, I., Badu, E., & Torgbenu, E. L. (2015). Challenges in accessing education for children with disabilities in Ashanti and Brong Ahafo regions of Ghana. *Journal of Disability Studies*, *1*(2), 61-68.

Mprah, W. M., Dwomoh, J. A., Opoku, M. P., Owusu, I., & Ampratwum, J. (2016). Knowledge, attitude and preparedness of teachers towards inclusive education in Ejisu-Juaben municipality in Ashanti region of Ghana. *Journal of Disability Management and Special Education*, *6*(2), 1-15.

Moonsamy, S., Greenop, K., & Jordaan, H. (2009). Cognitive processing and narrative discourse production

in children with ADHD. *South African Journal of Psychology*, *39*(3), 326-335.

Ndukuba, A. C., Odinka, P. C., Muomah, R. C., Obindo, J. T., & Omigbodun, O. O. (2017). ADHD among rural southeastern Nigerian primary school children: Prevalence and psychosocial factors. *Journal of Attention Disorders*, *21*(10), 865-871. doi: 10.1177/1087054714543367

Obeng, C. (2007). Teacher's views on the teaching of children with disabilities in Ghanaian classrooms. *International Journal of Special Education*, *22*(1), 96-102.

Ocloo, M. A., & Subbey, M. (2008). Perception of basic education school teachers towards inclusive education in the Hohoe District of Ghana. *International Journal of Inclusive Education*, *12*(5-6), 639-650.

Opoku, M. P., J-F, Agbenyega, J. Mprah, W. K., Mckenzie, J. Badu, E (2017). Decade of inclusive education in Ghana: Perspectives of special educators. *Journal of Social Inclusion*, *8*(1), 4-20.

Opoku, M. P., Badu, E., Amponteng, M., & Agyei-Okyere, E. (2015). Inclusive education at the crossroads in Ashanti and Brong Ahafo regions in Ghana: Target not achievable by 2015. *Disability, CBR & Inclusive Development*, *26*(1), 63-78.

Perold, M., Louw, C., & Kleynhans, S. (2010). Primary school teachers' knowledge and misperceptions of attention deficit hyperactivity disorder (ADHD). *South African Journal of Education*, *30*(3), 457-473. Retrieved from www.scielo.org.za/pdf/saje/v30n3/v30n3a08.pdf

Scime M., & Novilitis, J. M. (2006). Task performance and response to frustrations in children with Attention Deficit Hyperactivity Disorder. *Psychology in the School*, *43*(3), 377-386.

Shroff, H. P., Hardikar-Sawant, S., & Prabhudesai, A. D. (2017). Knowledge and misperceptions about Attention Deficit Hyperactivity Disorder (ADHD) Among school teachers in Mumbai, India. *International Journal of Disability, Development and Education*, *64*(5), 514-525. doi: 10.1080/1034912X.2017.1296937

Stampoltzis, A., & Antonopoulou, K. (2013). Knowledge and misconceptions about attention deficit hyperactivity disorder (ADHD): A comparison of Greek general and special education teachers. *International Journal of School & Educational Psychology*, *1*(2), 122-130. doi: 10.1080/21683603.2013.803000

Topkin, B., Roman, N. V., & Mwaba, K. (2015). Attention Deficit Disorder (ADHD): Primary school teachers' knowledge of symptoms, treatment and managing classroom behavior. *South African Journal of Education, 35*(2), 01–08. doi:10.15700/SAJE.V35N2A988

Vasiliadis, H. M., Diallo, F. B., Rochette, L., Smith, M., Langille, D., Lin, E., ... & Lesage, A. (2017). Temporal trends in the prevalence and incidence of diagnosed ADHD in children and young adults between 1999 and 2012 in Canada: A Data Linkage Study. *The Canadian Journal of Psychiatry*, *62* (12), 818-826.

Wang, L. J., Lee, S. Y., Yuan, S. S., Yang, C. J., Yang, K. C., Huang, T. S., ... & Shyu, Y. C. (2017). Prevalence rates of youths diagnosed with and medicated for ADHD in a nationwide survey in Taiwan from 2000 to 2011. *Epidemiology and Psychiatric Sciences*, *26*(6), 624-634. doi:10.1017/S2045796016000500

Yin, R. K. (2003). *Design and methods. Case study research*. London: Sage.

Youssef, M. K., Hutchinson, G., & Youssef, F. F. (2015). Knowledge of and attitudes toward ADHD among teachers: Insights from a Caribbean nation. *SAGE Open*, *5*(1), 1-8. doi: 10.1177/2158244014566761

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