Teachers' Knowledge about attention deficit Hyperactivity Disorder (ADHD) it's Prevalence among primary school children in Azzawia - Libya

Thesis submitted for partial fulfillment of M.D in public health

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Abstract :

Attention Deficit Hyperactivity Disorder (ADHD) is one of the most prevalent chronic health disorders affecting school age children. ADHD is a disorder of childhood and adolescence characterized by a pattern of extreme pervasive, persistent and debilitating inattention, over activity, and impulsivity. There are 3 major different subtypes of ADHD: predominantly inattentive subtype, predominantly hyperactive–impulsive subtype, and combined inattentive/hyperactive-impulsive. ADHD manifests in approximately 4-12% of children between the ages of 6 and 12 years *Brown et al., (2001) and CDC (2005)*. Several studies estimated the prevalence of ADHD, in USA 4-8% *(Subcommittee on ADHD (2001)*, Korea 7.6% to 9.5% *Chae et al., (2001)*, India 20% *Malhi et al., (2000)* and Emirates 29.7% in United Arab *(Bu-Haroon, 1999).* In Egypt A study done in primary school children in Cairo showed that The prevalence was 6.2% when the study done by teacher scale, this result decrease to 3.4% when a clinical method was used *(Mahmoud-Hammouda, 2008).*

The variation is due to changing diagnostic criteria over time; difference in methods of diagnosis and other environmental and social factors *(Brown et al., 2004).* as various environmental adversities have been found to increase the risk for ADHD and associated morbidity, and these factors have a cumulative effect *(Biederman et al., 2002).*

In the diagnosis of ADHD; irrespective of the methods and measures used to collect diagnostic and background information the selection of informants should take account of the length of time they have known the child (to establish if symptoms meet minimum duration criteria) and their familiarity with the child's behavior in a given setting. Parents and teachers are seen as natural informants in the assessment of the child. Currently, the diagnosis of ADHD is most often made using DSM-IV-TR criteria. These criteria are used as the standardized clinical definition to determine the presence of ADHD, and to detect it's subtypes *(APA, 2000).*

Children and adolescents with ADHD have been shown to be at increased risk for a broad range of negative outcomes; including antisocial behavior as oppositional defiant disorder (ODD), conduct disorder (CD), and failed relationships. In addition to depression, anxiety, school failure and dropout. Adolescents with ADHD are at risk of workplace underachievement, substance abuse disorders, and low self-esteem *(Biederman et al., 2002).* Subsequently, this burden extends further into the community and society as a whole, having far-reaching economic and social consequences. Two major modalities of treatment are available for treatment of ADHD: behavioral interventions and

pharmacotherapy. However, multimodality treatment that includes both is often considered optimal (AAFP, 2003).

The aim of the study was to assess the knowledge of teachers regarding ADHD and to estimate the prevalence of ADHD among primary school children in Az Zawia municipality- Libya.

METHOD :

This study was; carried out in AzZawia municipality-Libya, on a sample of 394 (3 missed) Primary schoolchildren (these represents all the students in the selected classes), within the age group from 7 -12 years old, of both sexes, 177 males (45.3%), and 214 females (54.7%) to assess the prevalence of ADHD, it was done at the last month of the academic year. The main teachers for the classes of those children were included in the study, as they have the most frequent sessions with the students, and they were 18 teachers out of 20 as 2 teachers refuse the participation in the study..

As Az Zawia municipality is divided in to 35 districts, five districts were selected using a systematic random sampling technique. From each district one school was chosen using a simple random technique, from each school 5 classrooms were selected one from each grade (from second to sixth grade, as the first grade students are not expected to follow rules and behave in socially appropriate ways yet).

Data collection tool:

1. *The teacher's knowledge questionnaire*: It is self-administered questionnaire for assessment of teacher's knowledge about ADHD; before and after a two day intervention program. It is of 16questions regarding (age, sex, educational level, number of experience years and about the presence of a social worker in a school) also, regarding (source of knowledge, knowledge of teachers about; symptoms, etiology, course, nature, and treatment of ADHD.
2. *The ADHD rating scale Arabic version,* It is the validated ADHD rating scale (Arabic version) *(Ahmed Hassan et al., 2009).* It is the translated and linguistically standardized version of the original ADHD rating scale (DSM IV) *(Biederman, 1998).* We have chosen the modified Arabic version of the DSM-VI of ADHD as a screening questionnaire as it has well established reliability and validity, it is validated and used in Saudi Arabia 2008. It contains 14 questions about ADHD symptoms, five questions for inattention, and the remaining nine questions for the hyperactivity/impulsivity symptoms, each of which is a 4 point scale (0-3) arranged in the following format: (0) not at all, (1) just a little, (2) much, (3) very much. At the end of the academic year the questionnaire was filled by the teachers -as to give enough contact time between the teachers and their pupils –at least six months, at the same period it was sent to the parents in order to score their children for ADHD.
3. *Parent questionnaire;* This questionnaire was filled by the student's parents at home It consists of 15 questions for studying some ADHD related factors; some questions regarding the sociodemographic information of the child; (the age, sex, education level of both parents, economy level, family size, live with one parent or not) and other questions about antenatal, natal, and postnatal history (time of delivery, site of delivery, complications after delivery, birth weight, birth order, breast feeding)

Written permission for the study was sought from school authorities and parents. Students who were diagnosed having ADHD were advised to consult their health care providers. Data entry and analysis were done, SPSS program version 15 and suitable statistical tools were applied. Frequency tables were used to describe qualitative data and Chi-square test was used as the test of statistical significance to detect difference

between groups. Significant values were considered at P< 0.05, and multiple regression analysis was done to find the most important risk factors. Odds Ratio-OR- was calculated when needed.

RESULT:

Table (1) shows that the social workers present in almost all (100%) of the schools included in the study, and about half (55.6%) of the studied group have a medium level education. Two third (66%) of the teachers have 1-10 teaching experience years. **Table (1):** Relation of Some Factors of the studied teachers with their knowledge about ADHD

Knowledge related Factors	Know about ADHD		Total
	Yes (No. (%)	NO No. (%)	
Presence of social worker at school:			
Yes	8 (44.4%)	10 (55.6%)	18 (100%)
• No			0 (0.00%)
Age (years):			
• ≥ 20	0 (0.00%)	3 (100%)	3 (16.7%)
• ≥ 30	2 (25.0%)	6 (75.0%)	8 (44.4%)
• ≥ 40	6 (85.7%)	1 (14.3%)	7 (38.9%)
Education level:			
• University.	2 (33.3%)	4 (66.7%)	6 (33.3%)
• High institute	1 (50.0%)	1(50.0%)	2 (11.1%)
• Medium institute (diplomat).	5 (50.0%)	5 (50.0%)	10 (55.6%)
Teaching experience years:			
• 1-10 years	3 (25.0%)	9 (75.0%)	12 (66.7)
• 10-20years	5 (83.3%)	1 (16.7%)	6 (33.3%)

Table (2) shows that (55.6%) of the studied teachers do not know anything about ADHD before the program, but their knowledge significantly improved after the program (100%) (P< 0.001). The most common source of knowledge was *internet* which comprises about (37.5%). Regarding their knowledge about the nature of the disease, about (82.4%) of the studied teachers' answers were incorrect, as they related the ADHD to be as spiritual disorder, but after the interventional program this myth significantly changed. Regarding the course of ADHD, all of the teachers under study answered incorrectly that the disease doesn't continue after childhood, but after the intervention (76.5%)of the studied teachers wrong answers were significantly changed to that (ADHD continue after childhood), P < 0.001.

Table (2): The general knowledge of the teachers studied group about ADHD, before and after the intervention program

Studied group / Knowledge	Beforethe intervention		After the intervention		P value
	No	%	No	%	
Know about ADHD					
· Yes	%)44.4(8		%)100(17		< 0.001
· No	%)55.6(10		0 (0.00%)		
Source of knowledge					
· T.V	1 (12.5%)				
· Friends	2 (25.00%)				
· Books and journals	2 (25.00%)				
· School(program)	0		——		——
· Internet	3 (37.5%)				
Nature of the disease					
· Neurobehavioral*	3 (17.6%)		15 (88.2%)		< 0.001
· Spiritual/Don't know	14 (82.4%)		2 (11.8%)		
Beginning of the symptoms					
· Before 7 years old*	2 (11.8%)		12 (70.6%)		< 0.001
· After 7yrs old/Don't know	15 (88.2%)		5 (29.4%)		
Course of the disease					
· Continue after childhood*	0 (0.00%)		13 (76.5%)		< 0.001
· Disappear after childhood/Don't know	17 (100%)		4 (23.5%)		
Total	17 (100)		17 (100)		

Table (3) shows that, (21.5%) of the studied primary school children were suspected to have ADHD according to teacher scoring.

Table (3): Prevalence of ADHD among the studied primary school children according to teacher score

Student groups	No.	Percent
Normal Students	307	(78.5%)
Suspected ADHD cases	84	(21.5%)
Total	391	(100.0%)

Table (4) shows that male students reported significantly higher level of ADHD suspected cases (37.9%) compared to females (7.9%), P < 0.001, and about one third (32.7) of the students that live with one parent was screened to have ADHD which is statistically significant P value (0.042).

Table (4): Comparison between normal students and suspected ADHD students according to teacher score as regards to socio-demographic characteristics

Studied groups / Socio-demographic characteristics	No ADHD	Suspected ADHD	P value	OR (95% CI)
	No. %	No. %		
	307 (78.5%)	84 (21.5%)	-	-
Age				
· 8-	105 (76.1%)	33(23.9%)	0.236	-
· 10-	141 (82.5%)	30 (17.5%)		1.48 (0.85-2.57)
· 12-13	61 (74.4%)	21 (25.6%)		0.91 (0.49-1.72)
Sex				
· Males	110 (62.1%)	67 (37.9%)	<0.001	7.06
· Females	197 (92.1%)	17 (7.9%)		(3.94-12.62)
Live with one parent or both				
· One parent	33(67.3%)	16 (32.7%)	0.042	1.95
· Both parents	274 (80.1%)	68 (19.9%)		(1.02-3.76)
Education of the father				
· High	130 (78.8%)	35 (21.2%)	0.911	1.03
· Medium	177 (78.3%)	49 (21.5%)		(0.63-1.68)
Education of the mother				
· High	159 (79.5%)	41 (20.5%)	0.628	1.13
· Medium	148 (77.5%)	43 (22.5%)		(0.70-1.80)
Economic status				
· Satisfactory	278 (77.4%)	81 (22.6%)	0.082	2.81
· Non satisfactory	29 (90.6%)	3 (9.4%)		(0.83-9.50)

Table (5) shows that preterm delivered students reported significantly higher level of ADHD suspected cases (77.8%) compared to term ones, (P < 0.001), (OR 13.6), and about one third (32.4%) of the children reported with health problems after delivery was among the ADHD suspected children.

Table (5): Comparison between normal students and ADHD suspected students as regards to perinatal risk factors

Studied group Perinatal risk factors	No ADHD	Suspected ADHD	P value	OR (95% CI)
	No. %	No. %		
Time of delivery				
· Preterm	2 (22.2%)	7 (77.8%)	<0.001	13.62 (2.80-66.40)
· Full term	288 (79.6%)	74 (20.4%)		
Type of delivery				
· Normal	281 (78.5%)	77 (21.5%)	0.60	1.30 (0.50-3.40)
· c/s or others	17 (73.9%)	6 (26.1%)		
Infant birth weight				
· ≤2500 gm	74 (74.7%)	25 (25.3%)	0.51	1.40 (0.60-3.30)
· 2500-4600 gm	192 (80.3%)	47 (19.7%)	0.96	0.97 (0.40-2.30)
· ≥4600	32 (80.00%)	8 (20.00%)	-	-
Type of infant feeding	197 (81.1%)	46 (18.9%)	0.10	1.50 (0.90-2.40)
· **Breast feeding**	110 (74.3%)	38 (25.7%)		
· **Bottle feeding**				
Child order in family	136 (80%)	34 (20%)	0.83	-
· **First**	133 (77.3%)	39 (22.7%)		
· **Second – fourth**	38 (77.6%)	11 (22.4%)		
· **Fifth+**				
Total	307 100	84 100		

DISCUSION:

shows that the studied teachers were (100%) females, with age ranged from 20-50 years old, about half (55.6%) of the studied teachers have medium level educations, two third (66%) of the teachers experience ≤10 years in teaching, and the social worker (school psychologist) present in almost all (100%) of the schools included in the study. Our data showed that the age of the studied teachers and their teaching experience years have positive relationship with their knowledge, as 85.7% of the teachers on the age group ≥40 years old reported that they know the term

ADHD, and about 83.3% of the teachers that experience teaching from 10 -20+ years also know the term ADHD. And these results coincide with ***Scuitto et al.,(2000)*** results that the year of teaching is positively related with teacher's knowledge. But not concordant with the

Algerian study done by ***Memadi, (2012),*** when he reported that; years of teaching have no effect on the teacher's knowledge.

This study shows that the knowledge of the teachers sound to be relatively low, as only 44.4% of the studied teachers know the term ADHD, but their knowledge significantly comprises about (37.5%), While T.V and school program ranks the least. As compare with the Iranian study we found that the main sources of knowledge about ADHD were: Television and radio; friends and relatives; periodical newspapers and magazines respectively.

Teacher's knowledge concerning the nature and the course of ADHD sound to be poor, as about (17.6%) of the studied teachers only know that ADHD is a neurobehavioral disorder while the others believe that ADHD is a (spiritual disorder) or (don't know), and only Africa; the results revealed that teachers were very knowledgeable about the nature, course and symptoms of ADHD, with more than 75% of the respondents correctly identifying the symptoms ***(Mariechen et al., 2010).***

The prevalence of ADHD among school-age children varies considerably across different studies and populations ***(Taylor et al., 2005).*** As In the current study, teacher scoring for the primary school children reported that about 21.5% of the studied subjects were suspected to have ADHD, male to female ratio is about 4:1.

This finding is correlated with some previous studies, as in Palestinian schoolchildren aged 6–15 years, 18.8% of the studied children were rated by teachers as ADHD suspected cases ***(Thabet et al., 2010)***, and also in Brazil ADHD prevalence was 13%, male to female ratio was 2:1 ***Fontana et al., (2007).***

In our study, we took into consideration the variables of age, male gender, living with one parent, and some perinatal factors. we found improved after the intervention program (100% $p < 0.001$). When we compare our results by other studies we found a study in Iran revealed that the Knowledge about ADHD also was relatively low **(Ghanizadeh et al., 2006)**. The most common source was internet which

(11.8%) of the teachers know that ADHD symptoms begin before age seven and all didn't know that it (continue after childhood). However, after the interventional program the myth that ADHD is a spiritual disorder is significantly changed; as more than three fourth (88.2%) of the teachers subsequently related ADHD to be as (neurobehavioral disorder), and (70.6%) correctly changed their answers as ADHD symptoms begin before age seven and (76.5%) reported that ADHD (continue after childhood) ($P < 0.001$). This is not correlated with a study done in South

that approximately two fifth (39.3%) of ADHD suspected cases was more identified in children within the age group from 8-10 years old, also our data shows that about one third (32.7) of the students that live with one parent was screened to have ADHD which is statistically significant ($P<0.05$). These results were in agreement with Arnold and Jensen who reported that negligence and parental deprivation -as isolation of child from one or both parents for a long time- increase risk for ADHD.

Regarding prematurity, it was significantly associated with ADHD ($P < 0.001$, OR 13.6), as preterm delivered children reported significantly higher level of suspected ADHD (77.8%) compared to term delivered children, and this result is concordant with a study in Taiwan, which found that the ADHD group had a significantly higher rate of prematurity ($P=0.004$) ***(Chu et al., 2012).*** As the underlying causes of premature birth, either genetic or environmental factors, that may also influence

or interfere with normal neuronal development and organizations, which may contribute to subsequent ADHD symptoms

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