

ATTENTION DEFICIT HYPERACTIVE DISORDERS (ADHD) SYMPTOMS AND ITS ASSOCIATION WITH ACADEMIC PERFORMANCE AMONG SECONDARY SCHOOL CHILDREN OF PRIVATE SCHOOLS, KARACHI PAKISTAN

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Abstract

The aim of the study is to identify the frequency of ADHD symptoms and its association with Academic Performance among secondary school children of Private Schools, Karachi, Pakistan. Analytical cross sectional study was conducted among 280 students who are at their adolescence, duration of the study were 3 months. Participants with age range 13-16 years were selected. Data were collected using Wender Uthra Rating scale (WURS). SPSS software version 16.0 was used to assess frequency & % for categorical and qualitative variables. Chi square test was used to find out the association of ADHD Symptoms with the risk factors such as Gender, Class/Grade, Birth order, Previous Grade/Academic Performance, Parent smoking history and No. of siblings. Out of 280 respondents, 152 (54.3%) were male and 128 (45.7%) were female. Majority of the students (n=160, 57%) were 14 and 15 years of age. Findings of the study revealed academic performance and parents smoking history shows significant association with the presence of ADHD Symptoms by showing P-value 0.015 and 0.017 respectively. Findings of the study conclude that in private schools of Karachi Pakistan, most significant association with the

prevalence of ADHD symptoms are smoking history of parents and the students' academic performance.

Keywords. Symptoms, Attention deficit hyper active disorder, adolescents, Academic Performance.

INTRODUCTION

Attention is the most important factor in education or in learning skills. Attention deficit hyperactive disorder (ADHD) causes lack of attention and disability in focusing on something which requires most of the attention. Attention deficit Hyperactive disorders (ADHD) is the psychiatric disorder, common in childhood and adolescents, it is related to two different aspects one is attention and the other one is hyperactivity (James, 1979). ADHD has three types: one is inattentiveness, second is hyperactivity and the other one is the combined type in which a patient shows the symptoms of both first two types; insensitivity and hyperactivity. (APA, 1994) The main characteristics of ADHD is marked by an ongoing pattern of inattention, physical over activity and impulsivity in addition to the important psychosocial problems like poor academic attainment and difficulties in interpersonal relationship.(Osman et al.,2015) It may be genetic problem or caused by the environmental influences. it can be common amongst those who have financial and residential issues. ADHD is not just affecting the home's life but also affect social life and academic results (Haqqi & Syed, 2005).It is often diagnosed during the primary school years with a serious consequence for the patients, their families and to the society.

It is commonly occurring in school students of primary and secondary, in some researches it is also mentioned that it occurs mostly in boys than in girls. It may affect about 2 million of school aged children (Centres for Disease control and Prevention, 2001) and if it is not treated at early stage, it remains in adolescent which causes social and family problems around them. There is no specific age range specified for ADHD but it mostly occurs in children due to incomplete development or injury to the part of the brain which controls attention.

Prevalence rate for ADHD in various studies conducted among adults has suggested 2.5% (Simon & et.al, 2009), 3.4% (Fayyad, et.al, 2007) and 5% (Willcutt, 2012).Studies have shown that around two third of children suffer from ADHD show symptoms in their teen-age and adulthood ,thus affects around 2-4% percent of teenagers and adolescent in United kingdom with a higher prevalence rate in boys than girls(Merikangas et al.,2009)

The prevalence of ADHD in India which is a densely populated country of Asia and neighboring country of Pakistan is approximately around 5%. In Pakistan the prevalence has been found around 2.49 % (Imran, 2007) But there is an absolute lack of indexed literature on the prevalence of ADHD in Pakistan and scarce data is available on adolescent with ADHD in Pakistan. (Hagell,2012) In schools of Karachi

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5.5 % school students are diagnosed with ADHD as compared to other mental illnesses. Among students of private schools the ratio is 6:1(Syed,et al ,2009).

In Karachi University there was a study conducted to compare the intensity level among graduate students of science and Arts subjects by Adult Self-Reported Scale .47 students were selected from both Science and Arts faculty (the largest faculties) for the sample; 21 male and 26 females. It was found that Science students are highly symptomatic to ADHD as compare to Arts students. (Asim.M, Akbar.N)

Another study in Muhammad Ali Jinnah University, Islamabad the study was conducted amongst BCS students by Ansari (2014) to check the prevalence of self-reported Attention Deficit Hyperactive Disorder.157 students were selected for the study from the age range of 17-25.The results showed that in BCS students junior students are susceptible to ADHD. Studies conducted by Hussain and Saleem (2015), measured the relation of level of attention and academic performances among school students. They found that poor performances are directly related to the low level of attention and average performances with moderate level of attention.

Major piece of work has been done by the researchers to provide care for children with ADHD but less attention has given to later stages. Due to limited evidence available, the American Academy of Pediatrics guidelines does not include adolescents and young adult which create a need of proper researches on what happened next when the young ones with ADHD move into the adolescent phase or through their second decade. Although it is clearly evident that most childhood cases of ADHD does not resolve until children enter to their puberty age (Wolraich et al., 2005)

Adolescent and young people with ADHD have poor concentration during exams and tutorials at the age of 13 to 18 which contribute to irritability and rebelliousness and difficulty in dealing with people in authority. Furthermore lack of aiming and focusing, organizing and planning all add to the challenge. (Hagell, 2012) As this issue is not yet acknowledge gravely in Pakistan. There is a negligible amount of research work conducted in Pakistan among adolescents with ADHD, its prevalence and effects on their activities and studies. The impact of ADHD symptoms on the studies and activities among the adolescents of Karachi Pakistan is not known. There is no such system in school of Pakistan to evaluate ADHD in their pupil and help them to overcome this disorder. Early Investigation and detection of ADHD is very essential and should start from schools through trained teams which should also be aware of the problem and know how to manage it (Osman et al., 2015). So

investigators felt the need to carry out a study that report the frequency of ADHD symptoms and its association with academic performance among the students of Karachi studying in secondary school. the present study may able to address and highlight this matter through which our ministry of education, school administration, principle, teacher and parents may also take measures to find suitable and applicable solutions. it may also help our health care system to create preventive programs to reduce the risk and hazardous impact of ADHD in school going children. The Objectives of the current study is to assess the frequency of symptoms of Attention Deficit Hyperactive disorders among the students of secondary school in Karachi and to measure the association between ADHD symptoms with current academic performance.

METHODS

STUDY DESIGN

A Cross sectional study was conducted to assess the frequency of ADHD symptoms and its association with academic performance among the students of secondary school. The targeted population of this study were the adolescents with age ranges 13-16 years studying in private sector secondary schools of Karachi, Pakistan. The duration of the study was of 3 months, from July 2016 to September 2016

SAMPLE SIZE

Daniel proposed formula, recommended for cross sectional study was used to calculate sample size.

$$n = z^2 p (1-p) / d^2$$

Where

$$z = 1.96$$

P=3% proportion (Imran .N, 2007)

D=0.02precision

Calculated Sample size: n=280

SAMPLE SELECTION

Multistage sampling technique was used. At First stage schools were selected. In second stage, students were selected though Random sampling technique.

Inclusion Criteria:

- Students of private schools
- Age group of 13 -16 years old will be the participants of the study.
- Both girls and boys

Exclusion Criteria:

- Non respondents
- Disable students

INSTRUMENT

In this study, items from reliable and valid Wander Utah Rating Scale (WURS) originally developed by Ward, Wender and Reimherr in 1993 were used to

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assess ADHD symptoms among adolescents. Wender Utah rating scale is available online for applying in the general population of adult, children and adolescents (Silverman, S. B. ,2012). The original WURS is 61-items instrument that was shortened to 25 items; Minimum score for WURS-25 items is zero (0) and maximum score is 100 and the cut-off score of 46 on this 25 question scale is identifies as the best differentiating with or without ADHD Symptoms. (Wand, Wender,&Reimherr,1993). Participants were reported their responses by rating the frequency with which a precise / particular symptom or behaviour incurred in past 3 months as an adolescent on a five item Likert Scale: (0) not at all, (1) mildly, (2) moderately, (3)often , and (4) very much regularly. Previous researches reported strong reliability and validity of WURS (25 items) questionnaire and Cronbach's Alpha is 0.93 and 0.95. (McCann.etal., 2000 & Öncü.e.tal.,2005)

METHOD OF DATA COLLECTION

The data were collected through semi constructed questionnaire from the secondary schools children of 3 private schools of Karachi. The Questionnaire was comprised of 3 sections: Section one includes demographic variables such as Gender, Age, No. Of siblings, Birth order, Parents smoking history, and Class status. Second section includes core research 25 items of WURS and last section include students academic performance/grade.In the first stage secondary schools from the private sector were selected. After getting permission from the school administration the questionnaires were administered in class rooms through group administration after explaining the objectives of the study and informed consent from individual students. Than the grading and academic performance of the students were also cross checked by the teacher or school administration to improve the authenticity of the result.

STATISTICAL ANALYSIS

Statistical analysis of the data was performed with SPSS software version 21.0. Frequency & % were assessed for categorical and qualitative variables. Chi Square was used to find the association between symptoms of ADHD and current academic performance. P-Values <0.05 is considered as significant for all analyses.

ETHICAL CONSIDERATION

Approval was obtained from the schools administration and the consent had been taken from participants by explaining purpose and objectives of the study.

RESULTS

A total of n=280 students were enrolled in the study. Majority students n=160 (57%) students were 14 and 15 years of age. Males were n=152 (54.3%) and females were n=128 (45.7%). Majority students n=109 (39%) were from 8th grade, n=92 (33%) , n=79(28%) were from 9th and 10th grade respectively as shown in

Table 1 Graphs 1-5.

Table 1: Socio-Demographic Characteristics of Participants

<i>Variables</i>	<i>Frequency (n)</i>	<i>Percentage (%)</i>
1. Age		
13 years	58	20.7
14 years	81	28.9
15 years	79	28.2
16 years	62	22.1
2. Gender		
Male	152	54.3
Female	128	45.7
3. Class/Grade		
8th grade	109	38.9
9th grade	92	32.9
10th grade	79	28.2
4. No. of Siblings		
0	12	4.3
1	18	6.4
2	83	29.6
3	80	28.6
4	50	17.9
5	23	8.2
>5	14	5
5. Birth Order		
First Child	98	35
Middle child	112	40
Last Child	70	25
6. Academic Performance		
Excellent(A-A+)	148	52.9
Good (B - B+)	87	31.1
Average (C - C+)	34	12.1
below average (D or Below)	11	3.9
7. Parents Smoke		

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Yes	83	29.6
No	196	70.4
8. ADHD Groups		
WURS(-ive)	169	60.4
WURS(+)Attention Deficit Hyperactivity Disorder	111	39.6

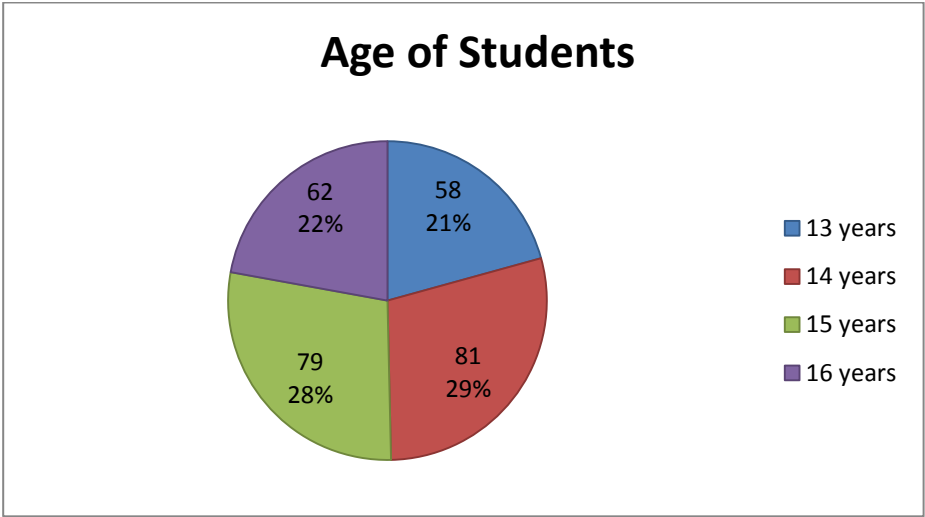


Figure 1 : Majority students, 160 (57%) were 14 and 15 years of age

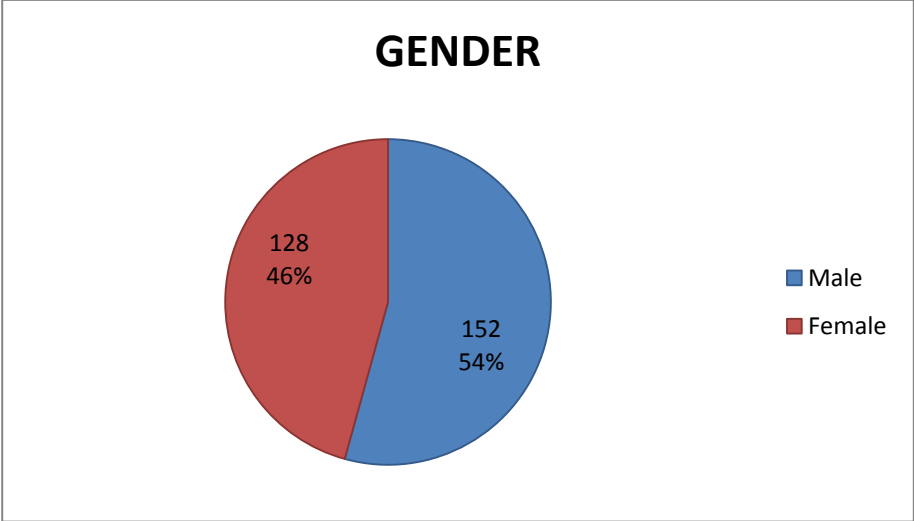


Figure 2: Males were 152 (54.3%) and females were 128 (45.7%)

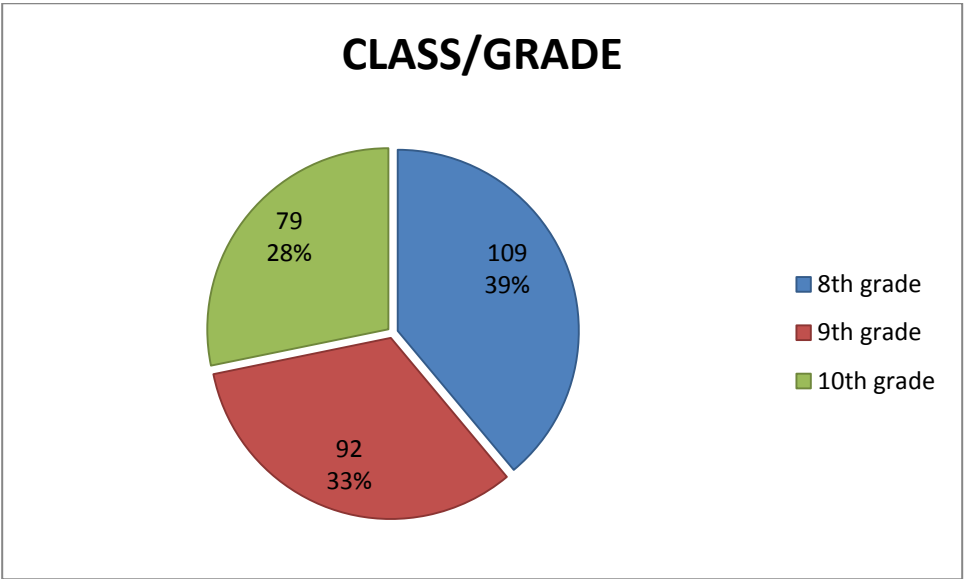


Figure 3: Majority students out of n=280 were from 8th grade, 109 (39%), and 92 (33%), & 79(28%) were from 9th and 10th grade respectively

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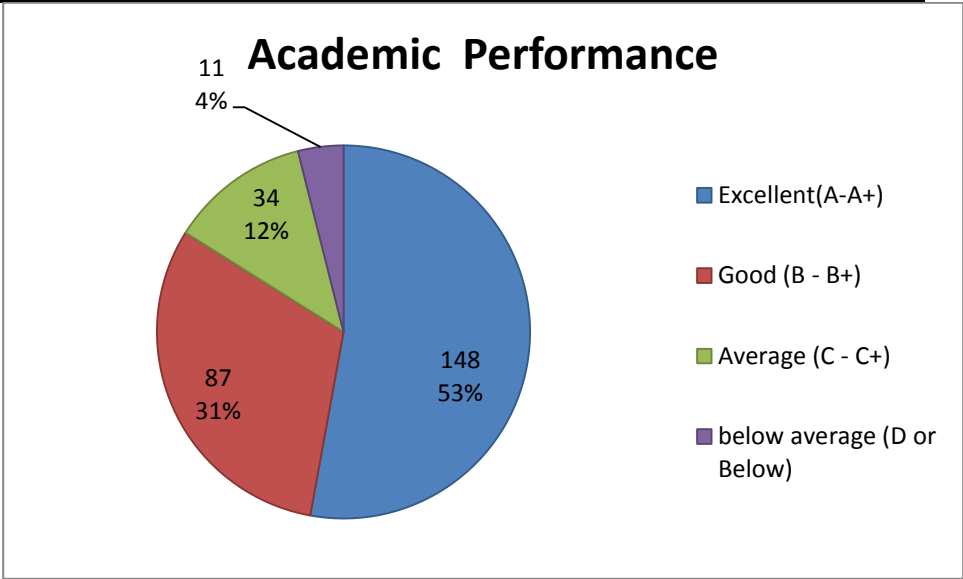


Figure 4: In terms of previous academic performance, out of n=280, 148(53% achieved Excellent results and 87 (31%) achieved good results

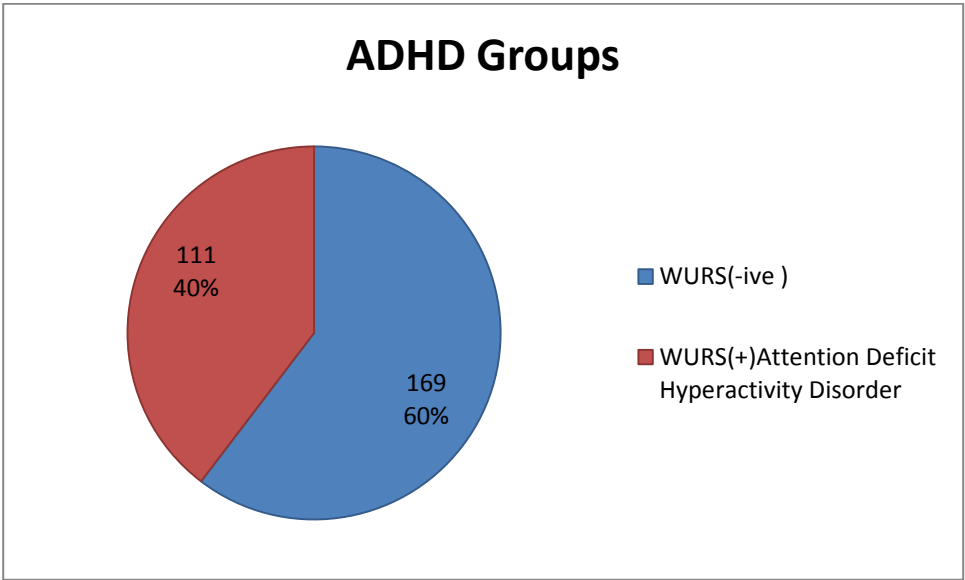


Figure 5: Describe that out of n=280 respondents 111(40%) were identified as WURS (+ive) in terms of ADHD symptoms and n=169 (60%) showed less symptoms of ADHD and identified as WURS (-ive)

Most of the respondents reported mild and moderate clinical characteristics

which includes concentration problem (34% & 27%), worried (30% & 35%), nervous (30% & 29%), inattentive in the class (31% & 22%), Have short tempered (23% & 24%), have temper outburst (27% & 26%), have trouble to achieve task (23 & 27%), feel unhappy (27% & 26%), disobedient with parents and teachers (31% & 32%), have low opinion (43% and 20%), irritable to others (36% & 27%), act without thinking (29% and 31%), act immature (33% & 28%), feel guilty (30% & 26%), have trouble as an overall learner (40% & 28%), have troubles with mathematics and numbers (30% & 23%), unable to achieve up to the level as a student (26% & 29%) as shown in Table 2, Graphs 6 & 7.

Table 2: Clinical Characteristics of Participants

Variables	Frequency (n)	Percentage (%)
1. How often do you have concentration problems		
Not at all(0)	40	14
Mildly(1)	95	34
Moderately(2)	77	27
Often(3)	36	13
Very much regularly(4)	32	11
2. How often do you feel worried?		
Not at all(0)	30	11
Mildly(1)	83	30
Moderately(2)	97	35
Often(3)	57	20
Very much regularly(4)	13	5
3. How often do you feel Nervous?		
Not at all(0)	18	6
Mildly(1)	83	30
Moderately(2)	80	29
Often(3)	50	18
Very much regularly(4)	23	8
4. How often do you feel you are Inattentive in the class?		

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<i>Not at all(0)</i>	67	24
<i>Mildly(1)</i>	87	31
<i>Moderately(2)</i>	62	22
<i>Often(3)</i>	41	15
<i>Very much regularly(4)</i>	23	8
5. How often do you feel you have a short-tempered (low boiling point)?		
<i>Not at all(0)</i>	42	15
<i>Mildly(1)</i>	65	23
<i>Moderately(2)</i>	68	24
<i>Often(3)</i>	53	19
<i>Very much regularly(4)</i>	52	19
6. How often do you feel you have temper outbursts or tantrums?		
<i>Not at all(0)</i>	54	19
<i>Mildly(1)</i>	77	27
<i>Moderately(2)</i>	73	26
<i>Often(3)</i>	55	20
<i>Very much regularly(4)</i>	21	7
7. How often do you feel you have a trouble with finish things that you had started?		
<i>Not at all(0)</i>	29	10
<i>Mildly(1)</i>	65	23
<i>Moderately(2)</i>	75	27
<i>Often(3)</i>	68	24
<i>Very much regularly(4)</i>	43	15
8. How often do you feel you have a strong-willed decision?		
<i>Not at all(0)</i>	35	12

<i>Mildly(1)</i>	67	24
<i>Moderately(2)</i>	64	23
<i>Often(3)</i>	68	24
<i>Very much regularly(4)</i>	46	16
9. How often do you feel you are sad (unhappy)?		
<i>Not at all(0)</i>	64	23
<i>Mildly(1)</i>	75	27
<i>Moderately(2)</i>	72	26
<i>Often(3)</i>	47	17
<i>Very much regularly(4)</i>	22	8
10. How often do you feel you are disobedient with parents or teacher?		
<i>Not at all(0)</i>	71	25
<i>Mildly(1)</i>	88	31
<i>Moderately(2)</i>	91	32
<i>Often(3)</i>	20	7
<i>Very much regularly(4)</i>	10	4
11. How often do you feel that you have a low (bad) opinion of yourself?		
<i>Not at all(0)</i>	66	24
<i>Mildly(1)</i>	121	43
<i>Moderately(2)</i>	56	20
<i>Often(3)</i>	25	9
<i>Very much regularly(4)</i>	12	4
12. How often do you feel you are irritable to others?		
<i>Not at all(0)</i>	63	22
<i>Mildly(1)</i>	100	36
<i>Moderately(2)</i>	76	28
<i>Often(3)</i>	31	11
<i>Very much regularly(4)</i>	10	4
13. How often do you feel you have mood		

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<i>swings?</i>		
<i>Not at all(0)</i>	39	14
<i>Mildly(1)</i>	78	28
<i>Moderately(2)</i>	56	20
<i>Often(3)</i>	66	23.6
<i>Very much regularly(4)</i>	41	14.6
14. How often do you feel you got easily angry?		
<i>Not at all(0)</i>	51	18
<i>Mildly(1)</i>	69	25
<i>Moderately(2)</i>	74	26
<i>Often(3)</i>	40	14
<i>Very much regularly(4)</i>	46	16
15. How often do you feel that you Act without thinking?		
<i>Not at all(0)</i>	40	14
<i>Mildly(1)</i>	81	29
<i>Moderately(2)</i>	88	31
<i>Often(3)</i>	37	13
<i>Very much regularly(4)</i>	34	12
16. How often do you feel you have act like an immature?		
<i>Not at all(0)</i>	38	14
<i>Mildly(1)</i>	93	33
<i>Moderately(2)</i>	79	28
<i>Often(3)</i>	53	19
<i>Very much regularly(4)</i>	17	6
17. How often do you feel guilty for your act?		
<i>Not at all(0)</i>	49	17
<i>Mildly(1)</i>	84	30

Moderately(2)	73	26
Often(3)	46	16
Very much regularly(4)	28	10
18. How often do you feel losing control of yourself?		
Not at all(0)	72	26
Mildly(1)	97	35
Moderately(2)	40	14
Often(3)	37	13
Very much regularly(4)	34	12
19. How often do you feel you act irrational (unreasonable)?		
Not at all(0)	87	31
Mildly(1)	98	35
Moderately(2)	52	19
Often(3)	30	11
Very much regularly(4)	13	5
20. How often do you feel you are unpopular with other children or have no good friends?		
Not at all(0)	103	37
Mildly(1)	69	25
Moderately(2)	51	18
Often(3)	33	12
Very much regularly(4)	24	9
21. How often do you feel trouble seeing things from someone else's point of view?		
Not at all(0)	36	13
Mildly(1)	104	37
Moderately(2)	64	23
Often(3)	42	15
Very much regularly(4)	34	12
22. How often do you feel trouble with authorities like principle or head mistress?		

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<i>Not at all(0)</i>	67	24
<i>Mildly(1)</i>	86	31
<i>Moderately(2)</i>	59	21
<i>Often(3)</i>	39	14
<i>Very much regularly(4)</i>	29	10
23. As a student in school do you have a trouble as an overall learner?		
<i>Not at all(0)</i>	46	16
<i>Mildly(1)</i>	111	40
<i>Moderately(2)</i>	78	28
<i>Often(3)</i>	34	12
<i>Very much regularly(4)</i>	11	4
24. As a student in school do you have a trouble with mathematics or numbers		
<i>Not at all(0)</i>	59	21
<i>Mildly(1)</i>	84	30
<i>Moderately(2)</i>	65	23
<i>Often(3)</i>	44	16
<i>Very much regularly(4)</i>	28	10
25. As a student do you think you are not achieving up to the level		
<i>Not at all(0)</i>	51	18
<i>Mildly(1)</i>	74	26
<i>Moderately(2)</i>	81	29
<i>Often(3)</i>	52	19
<i>Very much regularly(4)</i>	22	8

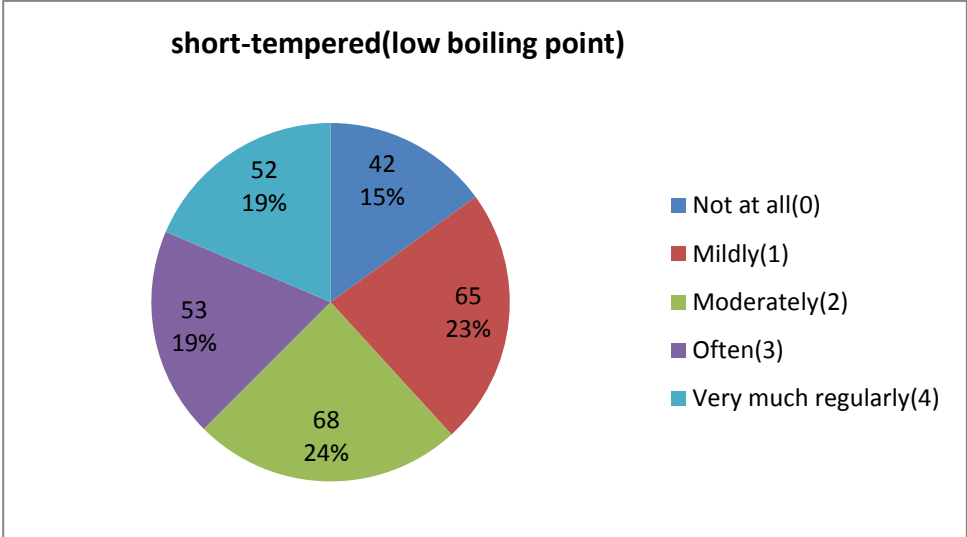


Figure 6: The most commonly identified symptom which was reported by $n=52(19\%)$ of the students was “short -tempered (low boiling point)”

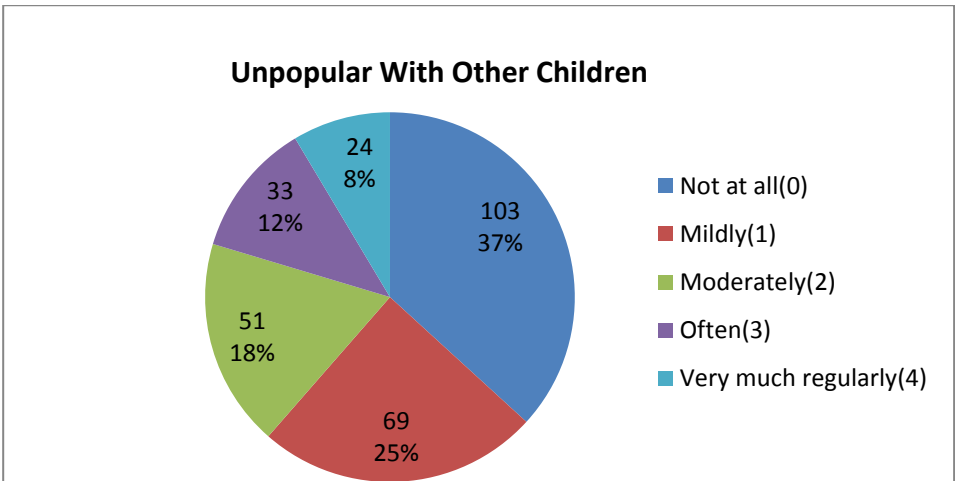


Figure 7: the least frequently identified symptoms of ADHD in adolescents of secondary schools was “Unpopular with Other Children” which was identified by $n=103(37\%)$ of the students

In order to assess the risk factors association with the prevalence of ADHD Symptoms in adolescent cross tab was applied between gender and ADHD groups which showed that out of 152 male, $n=84(55.3\%)$ were WURS (-ive) ; showed less ADHD symptoms and $n=68(44.7\%)$ were WURS positive while $n=43(33.6\%)$ female were WURS positive and having high presence of ADHD symptoms there is no significant association between gender and Prevalence of ADHD symptoms in adolescents students of secondary schools of Karachi. Furthermore, there is no significant association class /grade and No. of siblings with ADHD group.

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There is a significant association of ADHD symptoms with the academic performance of student (P-Value: 0.017), students who had bad academic performance have high occurrence of ADHD symptoms (n=9/11). Analysis of data also showed that there is a significant association between students whose parents are smoking have high occurrence of ADHD symptoms with a P value of 0.015. (Table: 03 & Graphs 8-11.)

Table 3: Association of Risk factors for ADHD in Adolescents of secondary schools

Risk factors for ADHD in Adolescents of secondary schools		ADHD Groups				P-Value
		WURS(-ive)		WURS (+ive) Attention Deficit Hyperactivity Disorder		
			%		%	
Gender	Male	4	55%	8	45%	.058
	Female	5	66%	3	34%	
Class/Grade	8 th Grade	3	58%	6	42%	.361
	9 th Grade	1	66%	1	34%	
	10 th Grade	5	57.0%	4	43%	
Birth Order	First Child	3	54%	5	46%	.166
	Middle child	8	61%	4	39%	
	Last Child	8	69%	2	31%	
Previous Grade/Academic Performance	Excellent(A- A+)	6	57%	2	47%	.017
	Good (B - B+)	3	31%	4	31%	

	<i>Average (C - C+)</i>	8	11%	6	14%	
	<i>Below average (D or Below)</i>		1%		9%	
<i>Smoking History</i>	<i>Yes</i>	1	24%	2	38%	.015
	<i>No</i>	28	76%	9	62%	
<i>No. of Siblings</i>	<i>up to 2</i>	0	41%	3	39%	.273
	<i>3-4</i>	3	43%	7	51%	
	<i>5 and above</i>	6	15%	1	10%	

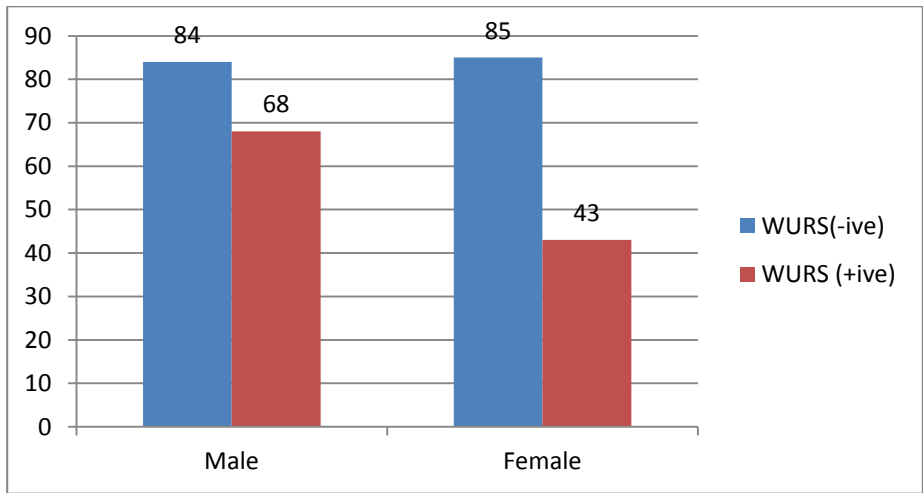


Figure 8 : Association between gender and ADHD groups

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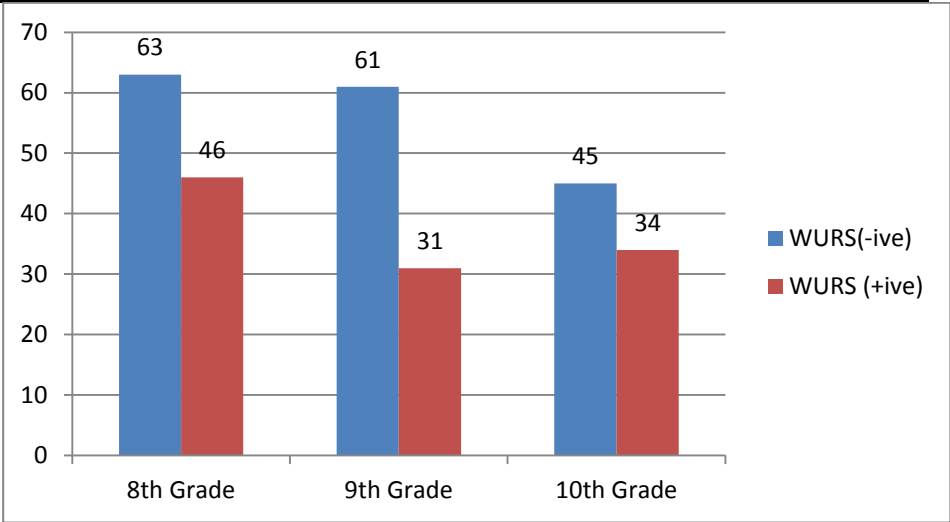


Figure 9 Association between Grade/Class and ADHD groups

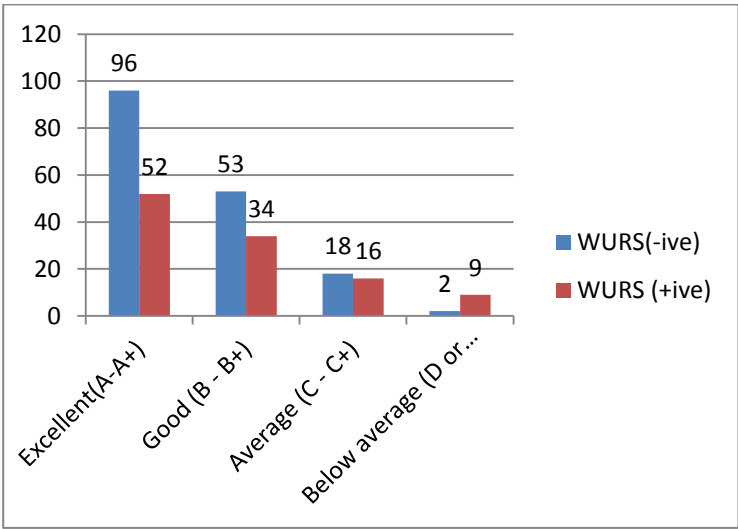


Figure 10 Association between academic performance and ADHD groups

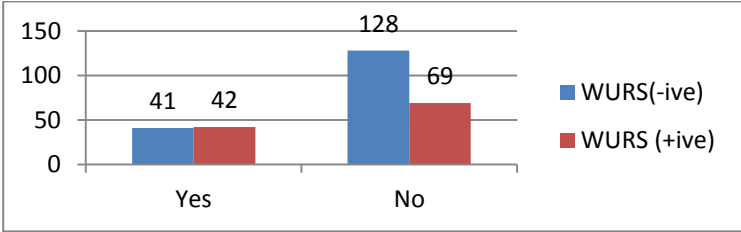


Figure 11 Association between Smoking history and ADHD group

DISCUSSION

The main objectives of this study were to evaluate frequency of ADHD and its association with academic performance among school going adolescents in Karachi. Findings of the study shown that male respondent were 54%, majority of the respondents (29% and 28%) were in age b/w 14 and 15years old respectively. 39% students were from 8th grade followed by 9th grade (33%) and 10th grade (28%). 30% and 29 % respondents report their number of sibling 2 and 3 respectively. Majority of respondent (53%) have been reported excellent academic performance (A-A+) and 31% have good academic performance (B-B+), 40% respondents reported ADHD +Ve as per WURS scoring criteria.

Similarly A study conducted in civil hospital Karachi by Sarwat.etal (2010) showed that gender distribution of those who are diagnosed with ADHD where male $n=24(60\%)$ and $n=16(40\%)$ female. Cross-sectional Study conducted in Aga khan university hospital Karachi on children with ADHD stated $n=20$ (77%) were boys and only 6 (23%)were girls in which 45% of boys were first child in there family (Qureshi &Thaver., 2003). Osman .Etal (2015) showed gender distribution in their study in which 511(51%) were males and 489(49%) were female. The age distribution showed 421 students (42%) were in an age group of (12-14). The findings of the previous studies are in agreement with the current study, majority of male respondents were reported ADHD symptoms than female students.

Result of the current study found that 45 % ($n=68/152$) male and 34% ($n=43/128$) female respondents were ADHD (+ive) (as per WURS scoring Criteria) Chang&Chuang,(2000) uses Wander Utha rating scale(WURS) to find out adolescent hyperactivity and stated that among $n=289$ students, 41 students(7%) were WURS (+ive)in which 18 boys(12.16%) and 23 girls (16%) Chang&Chuang,(2000) study showed the WURS(+) students scored highest on 'moody, have ups and downs (2.8 ± 0.8), 'hot or short tempered' (2.7 ± 0.8), 'stubborn, strong-willed' (2.5 ± 1.0)and 'concentration problem' (2.5 ± 0.9).

Findings of the study depicting that adolescents reported 43% ($n=34/79$), 34% ($n=31/92$) and 42% ($n=68/152$) ADHD (+ive) narrate to 10th, 9th and 8th grade respectively. In this study, student reported excellent, good and average academic performance have 47%, 31% and 14% ADHD (+ive) respectively. Current study shown that Out of 83 smoker parents children 38% have ADHD (+ive) and 62% ($n=69/197$) Non-Smoker also reported ADHD(+ive).

In terms of birth order, Students with 2 and 4 No. of siblings also reported ADHD (+ive) 51% and 39% respectively. Osman & e.tal (2015) study also showed no significant association with no of siblings or children in the family with the presence of ADHD symptoms with a P value of $p=0.644$).

CONCLUSION

Findings of the study conclude that in private schools of Karachi Pakistan,

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most significant association with the prevalence of ADHD symptoms are with smoking history of parents and the students with below average academic performance, whereas Gender, no. of siblings and class level has no association with the ADHD symptoms.



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