

**EPIDEMIOLOGICAL STUDY OF SYMPTOMS
OF ADHD IN ISLAMABAD AND
RAWALPINDI**



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By
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A dissertation submitted to the



Dr. Muhammad Ajmal
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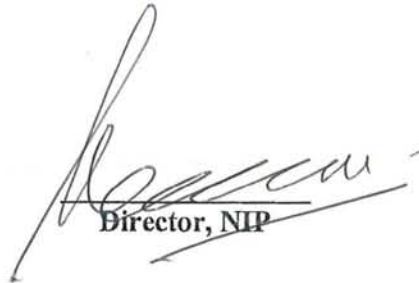
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CONTENTS

| | |
|---|------------|
| Acknowledgements | <i>i</i> |
| Abstract | <i>ii</i> |
| List of Tables | <i>iii</i> |
| List of Figures | <i>iv</i> |
| | |
| CHAPTER-I: INTRODUCTION | 1 |
| Historical Background of ADHD | 1 |
| Classification and Diagnosis of ADHD | 2 |
| Diagnostic Criteria for ADHD | 5 |
| Epidemiology of ADHD | 7 |
| Associated Characteristics | 10 |
| Theory, Etiology, Diagnosis and Treatment of ADHD | 14 |
| Interventions for ADHD | 22 |
| ADHD Children at School | 26 |
| Rationale of the Present Research | 29 |
| | |
| CHAPTER-II: METHOD | 31 |
| Objectives | 31 |
| Sample | 31 |
| Sample | 31 |
| Instruments | 31 |
| Procedure | 32 |
| | |
| CHAPTER-III: RESULTS | 34 |
| | |
| CHAPTER-IV: DISCUSSION | 51 |
| | |
| References | 55 |
| Annexure | |

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ABSTRACT

Current study was designed to explore ADHD behavior children from Islamabad and Rawalpindi. The study consisted of 500 contacted samples. In which 23 percent of the children were six years old, 6.8 percent were 7 years old, 27.3 percent of the children were 8 years old, 43.2 percent of the children were 9 years old, 13.6 percent of the children were 10 and 4.5 percent of the children were 11 years old. In general literature says that ADHD is manifested in the age range of 7-12 years. This seems to be reflected by our data. Corresponding to the age categorization was the class wise distribution of the same. There were four categories and problem was high in intensity in class 3 with 43.2% and it was low in class 5 with 6.8%. Parental and family factors were also taken into consideration. Parental education was also taken into consideration. 36.4 percent of the fathers were graduate. Only 29.5% parents had lower education level than graduation. Father's occupation was also inquired. There were two categories private and government. The percentage was high in private sector with 61.4% and frequency was 27 as compared to government sector where percentage was 29.5% and frequency was 13. There were 5 different categories to specify the education of mothers. Higher percentage of respondents were intermediate (40.9%, $f = 18$) whereas it was low at primary level with 4.5%. 6.8 percent of the mothers were employed in the private sector. High percent of respondents refuse to answer this question. This shows that the sample belonged to upper middle class. The parents were educated. This means that the incidence of ADHD cannot be associated with poor lifestyles and lack proper knowledge about parenting. This sample was from middle class family that is supposed to be the custodian of good family values. None of the sample was reported to be adopted. Majority had three or more than three siblings (29.5%, $f = 13$). The intensity was high for second and third birth order. Majority of the children showed delayed milestones and complications after birth.

LIST OF TABLES

| | | |
|------------------|---|----|
| Table 1: | School wise distribution of the sample | 34 |
| Table 2: | Age wise distribution of the sample | 35 |
| Table 3: | Gender wise distribution of the sample | 36 |
| Table 4: | Class wise distribution of the sample | 37 |
| Table 5: | Father's education wise distribution of the sample | 38 |
| Table 6: | Father's occupation wise distribution of the sample | 39 |
| Table 7: | Mother's education wise distribution of the sample | 40 |
| Table 8: | Mother's occupation wise distribution of the sample | 41 |
| Table 9: | Child adopted wise distribution of the sample | 42 |
| Table 10: | Parent divorce wise distribution of the sample | 43 |
| Table 11: | Siblings wise distribution of the sample | 44 |
| Table 12: | Sibling's birth order wise distribution of the sample | 45 |
| Table 13: | Monthly income wise distribution of the sample | 46 |
| Table 14: | Health history wise distribution of the sample | 47 |
| Table 15: | Pregnancy related wise distribution of the sample | 48 |
| Table 16: | Birth related wise distribution of the sample | 49 |
| Table 17: | Temperament wise distribution of the sample | 49 |
| Table 18: | Basic Milestones wise distribution of the sample | 50 |

LIST OF FIGURES

| | | |
|-------------------|---|----|
| Figure 1: | School wise distribution of the sample | 34 |
| Figure 2: | Age wise distribution of the sample | 35 |
| Figure 3: | Gender wise distribution of the sample | 36 |
| Figure 4: | Class wise distribution of the sample | 37 |
| Figure 5: | Father's education wise distribution of the sample | 38 |
| Figure 6: | Father's occupation wise distribution of the sample | 39 |
| Figure 7: | Mother's education wise distribution of the sample | 40 |
| Figure 8: | Mother's occupation wise distribution of the sample | 41 |
| Figure 9: | Child adopted wise distribution of the sample | 42 |
| Figure 10: | Parent divorce wise distribution of the sample | 43 |
| Figure 11: | Siblings wise distribution of the sample | 44 |
| Figure 12: | Sibling's birth order wise distribution of the sample | 45 |
| Figure 13: | Monthly income wise distribution of the sample | 46 |

INTRODUCTION

INTRODUCTION

Attention Deficit Hyperactivity as a disorder in children is marked by difficulties in focusing adaptively on the task at hand by inappropriate fidgeting and antisocial behavior. It seriously curtails their ability to concentrate on the tasks at hand. It prevents children from keeping their mind on particular task and also results in hyperactivity. Hyperactivity is in the form of fidgeting, impulsivity, and distractibility. Children with hyperactivity show inappropriate excessive motor movements (such as running, climbing), attention problems, poor impulse control, and a decreased ability to inhibit emotional responses. Due to their overactive tendencies, they appear to be haphazard, poorly organized, and lacking a clear goal orientation. There is much functional impairment associated with the disorder including academic underachievement, school suspensions, and antisocial behavior (Goldstein, 1996). In the academic realm the effects of Attention Deficit Hyperactive are significant. Children with Attention Deficit Hyperactive Disorder (ADHD) in middle childhood (6 to 12 years) continue to demonstrate difficulties in peer relations, impulsivity (poor self control), and inadequate delay skills (easily frustrated).

Historical Background of Attention Deficit Hyperactive Disorder

ADHD has traveled a long and tortuous road of conceptualizations. Literary references to individuals having serious problems with inattention, hyperactivity, and poor impulse control have been with us for some time.

According to Wolraich and Baumgaertel (1997), description of children with ADHD can be traced back as early as 1843 when a German Physician, Hoffmann, described a hyperactive child, "Fidgety Phil", and an inattentive child. "Harry Cook in the Air" in a book he wrote for his children. James (1950) in "Principles of Psychology" described a normal variant of character, which he called the "explosive will" that resembles the difficulties experienced by those who today are called ADHD. There is a normal type of character, in which impulses seem to discharge so

promptly into movements that inhibitions get no time to arise. These are the 'daredevil' and 'mercurial' temperaments, overflowing with animation, and fizzling with talk.

Still (1902) reported on a group of 20 children in his clinical practice whom he defined as having a deficit in "volitional inhibition" or a "defeat in moral control" over their own behavior. Aggressive, passionate, lawless, inattentive, impulsive, and overactive were descriptions he applied to these children. According to Still (1902), this pattern occurred more often in boys than in girls. Still's observations were quite astute describing many of the associated features of ADHD that would come to be corroborated in research more than 50 to 90 years later (Sandberg, 1996).

The initial interest in children with similar characteristics seems to have arisen in North America around the time of the great encephalitis epidemics of 1917-1918. Children surviving these brain infections were noted to have many behavioral problems similar to those comprising contemporary ADHD (Nelson & Israel, 2000). These causes and others known to have arisen from birth trauma, head injury, toxin exposure, and infections gave rise to the concept of a brain-injured child syndrome. This concept would later evolve into that of minimal brain damage, and eventually minimal brain dysfunction (Kessler, 1980).

In 1950s more specific behaviors of hyperactivity and poor impulse control, labeling the condition as "hyperkinetic impulse disorder" and attributing it to cortical over stimulation due to poor thalamic filtering of stimuli entering the brain were focused (Knobel, Wolman, & Mason, 1959; Laufer, Denhoff, & Saolomans, 1957).

Classifications and Diagnosis of ADHD

Diagnostic and Statistical Manual of Mental Disorders (DSM-II, 1968). In the second edition of Diagnostic and Statistical Manual of Mental Disorders (DSM-II) all childhood disorders were described as "reactions" and the hyperactive child syndrome became "hyperkinetic reaction of childhood". It was defined simply as: "this disorder is characterized by over activity, restlessness, distractibility, and short

attention span, especially in young children; the behavior usually diminishes in adolescence” (American Psychiatric Association, 1968, p.50).

By the 1970s, research was appearing that emphasized the importance of problems with sustained attention and impulse control in addition to hyperactivity in understanding the nature of the disorder (Douglas, 1972). Douglas (1997) would eventually come to theorize that the disorder was comprised of four major deficits, these being in (i) the investment, organization and maintenance of attention and effort, (ii) the ability to inhibit impulsive behavior, (iii) the ability to modulate arousal levels to meet situational demands, and (iv) an unusually strong inclination to seek immediate reinforcement (Barkley & Marsh, 1996).

Diagnostic and Statistical Manual of Mental Disorders (DSM-III, 1980).

The third version of DSM appeared in (1980) and the disorder was named as Attention Deficit Hyperactivity Disorder. According to DSM-III Attention Deficit Hyperactivity Disorder is characterized in the list of disorders, which occur first in infancy, childhood, or adolescence. The essential features are signs of developmentally inappropriate inattention and impulsivity. In classroom attention difficulties and impulsivity are evidenced by child's not staying with tasks and having difficulty organizing and completing work. At home attention problems are shown by a failure to follow through on parental requests and instructions and by the inability to stick to activities including play for periods of time appropriate for the child's age.

The DSM-III describes three characteristics course of the disorder. In the first, all the symptoms persist into adolescence or adult life. In the second the disorder is self-limited and all the symptoms disappear completely at puberty. In the third the hyperactivity disappears but the attentional difficulties and impulsivity persist in adult life.

There is increasing evidence that symptoms associated with ADHD continue into adolescence and adulthood for a substantial number of individuals (Klein & Mannuzza, 1991; Weiss & Hechtman, 1986).

Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R, 1987). In 1987, the disorder was named as Attention Deficit Hyperactivity Disorder in DSM-III-R (American Psychiatric Association, 1987) and a single list of items incorporating all three symptoms with a single threshold for diagnosis was specified. Children were diagnosed on the basis of displaying eight of fourteen behaviors, which could be different mixes of inattention, hyperactivity, and impulsivity.

Current Classification and Diagnosis

Diagnostic and Statistical Manual of Mental Disorders (DSM-IV, 1994). The reconceptualization of ADHD has been done in DSM-IV in 1994; Attention Deficit Hyperactivity Disorder is now called and viewed as having two factors inattention and hyperactivity/impulsivity. The two factors compose three subtypes: Predominantly inattentive, predominantly hyperactive/impulsive, and a combined type.

The criterion behaviors appear to some degree in normal children and may vary with developmental level. Therefore diagnosis of ADHD demands display of symptoms for at least six months. Behavioral manifestations of ADHD depend somewhat on the settings in which they are observed. Some children appear pervasively inattentive, hyperactive with parents, teachers, or peers. Others appear to show disturbed behavior in only one setting and are said to show situational ADHD (Walker & Roberts, 1992).

Primary Clinical Characteristics of ADHD

According to DSM-IV the primary clinical characteristics defines:

Inattention. The problem with attention is witnessed in the child's inability to sustain or respond to tasks or play activities as long as others of the same age and to follow through on rules and instructions as well as others. It is also seen in the child being more disorganized, distracted, and forgetful than others of the same age. Parents and teachers frequently complain that these children do not seem to listen as well as they should for their age, can not concentrate, are easily distracted, fail to

finish assignments, day dream, and change activities more often than other (Barkley, DuPaul, & McMurray, 1990).

Hyperactivity. Children with ADHD often are described as always on the run, restless, fidgety, and unable to sit still. These children squirm, wiggle, tap their fingers, and elbow their classmates. Hyperactive children appear to have difficulty in regulating their actions according to the wishes of others or to the demands of the particular situation. Parents and teachers describes them as acting as if driven by a motor, incessantly in motion, always on the go, and unable wait for events to occur (Nelson & Israel, 2000).

Impulsivity. The essence of impulsivity is a deficiency in inhibiting behavior, which appears as “acting without thinking”. The child may jump in and try to solve a problem before figuring out first step, heedlessly engage in dangerous behaviors, cut in line in front of others, or take shortcuts when performing at task (Barkley & Marsh, 1996).

Children with ADHD interrupt others who might be busy or they display tremendous difficulty waiting for their turn in games. They may also begin tasks before directions are completed, take unnecessary risks, talk out of turn or make indiscreet remarks without regard for social consequences (Walker & Roberts, 1992).

Diagnostic criteria for Attention-Deficit/Hyperactivity Disorder

The essential feature of ADHD is a persistent pattern of inattention and hyperactivity/impulsivity. Additionally it is assumed that inattention and hyperactivity is more frequent and is severe enough to be called problematic. Behavioral manifestations usually appear in multiple contexts, including home, school, and work antisocial situations. To make the diagnosis some impairment must be present in these settings. Technically the functioning of the child should be problematic in at least two contexts, or otherwise be severely disruptive in only one setting.

A. Either (1) or (2):

- (1) Six (or more) of the following symptoms of inattention have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level:

Inattention

- (a) Often fails to give close attention to details or makes careless mistakes in school work, work, or other activities.
- (b) Often has difficulty sustaining attention in tasks or play activities.
- (c) Often does not seem to listen when spoken to directly.
- (d) Often does not follow through on instructions and fails to finish school work, chores, or duties in the workplace (not due to oppositional behaviors or failure to understand instructions).
- (e) Often have difficulty organizing tasks and activities.
- (f) Often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as school work or homework).
- (g) Often loses things necessary for tasks or activities (e.g., toys, school assignments, pencils, books or tools).
- (h) Is often easily distracted by extraneous stimuli.
- (i) Is often forgetful in daily activities.

- (2) Six (or more) of the following symptoms of hyperactivity-impulsivity have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level:

Hyperactivity

- (a) Often fidgets with hands or feet or squirms in seat.
- (b) Often leaves seat in classroom or in other situations in which remaining seated is expected.
- (c) Often runs about or climbs excessively in situations in which it is inappropriate in adolescents or adults may be limited to subjective feelings of restlessness).
- (d) Often has difficulty playing or engaging in leisure activities quietly.
- (e) Is often “on the go” or often acts as if “driven by a motor”.
- (f) Often talks excessively.

Impulsivity

- (g) Often blurts out answers before questions have been completed.
 - (h) Often has difficulty awaiting turn.
 - (i) Often interrupts or intrudes on others (e.g., butts into conversations or games).
- B. Some hyperactive-impulsive or inattentive symptoms that caused impairment were present before age 7 years.
- C. Some impairment from the symptom is present in two or more settings (e.g., at school [or work] and at home).
- D. There must be clear evidence of clinically significant impairment in social, academic or occupational functioning.
- E. The symptoms do not occur exclusively during the course of a pervasive developmental disorder, schizophrenia, or other psychotic disorder and are not better accounted for by another mental disorder (e.g., mood disorder, anxiety disorder, dissociative disorder, or a personality disorder).

Code based on type

- 314.01 *Attentions-Deficit/Hyperactivity Disorder, Combined Type:*** if both criteria A1 and A2 are met for the past 6 months.
- 314.00 *Attentions-Deficit/Hyperactivity Disorder, Predominantly Inattentive Type:*** if criterion A1 is met but Criterion A2 is not met for the past 6 months.
- 314.01 *Attention-Deficit /Hyperactivity Disorder, Predominantly Hyperactive-Impulsive Type:*** if criterion A2 is met but criterion A1 is not met for the past 6 months.

Epidemiology of ADHD

Prevalence. The prevalence of ADHD is frequently estimated at about 3 to 5 percent of the school-age population. This figure is based on clinic cases, when parents and teachers provide data; prevalence is variable and reaches as high as 20 percent (American Psychological Association, 1994).

Malhi and Singhi (2001) conducted a study aimed at assessing the psychosocial adjustment of children with ADHD and contrast with a matched group of healthy children. ADHD has been estimated to be present in as many as 5% to 10% of all school age children (e.g., Anderson, Williams, McGee & Silva, 1987; Bhatia, Nigam, Bohra, & Malik, 1991; Wolraich, Hannah, Pinnock, Baumgaertel, & Brown, 1996). Results indicated that as compared to controls, ADHD children had significantly lower self esteem, poorer adjustment, and higher psychopathology.

Batsche and Knot (1994) described that ADHD is more frequently diagnosed in boys than in girls with ratio of 3:1 to 6:1. However the gender difference in actual diagnosis may be due to the differing symptom pattern between boys and girls, because girls are less likely to exhibit hyperactive and aggressive symptoms than are boys. More boys than girls consistently receive the diagnosis of ADHD, with the ratio of four to nine boys to one girl (APA, 1994).

ADHD is one of the most frequently diagnosed behavior problem in the pediatric population (Douglas, 1997). The prevalence of this disorder had been estimated between 5% and 25%.

Gender Differences

ADHD is more common in boys than in girls and different as well, for example, girls are less hyperactive and in clinic samples more impaired in intellectual functioning (Walker & Roberts, 1992).

Earlier research showed different risk factors and characteristics for girls and boys with ADHD. Although some studies indicate few differences based on gender, and other studies report important gender differences, teachers continue to identify more boys than girls with ADHD symptoms. According to Cantwell (1996), ADHD is diagnosed more in boys than in girls with 9 to 1 ratio in clinical samples and 4 to 1 in epidemiological samples. Girls have more inattentive and cognitive problems and fewer aggressive/impulsive problems than boys, although there is a general lack of information about ADHD in girls, boys are four times hyperactive than girls and

twice as inattentive. ADHD lasts beyond childhood, with as many as 65% of children carrying the symptoms into adulthood (Dulcan et al., 1997).

Ballard and Bolan (1997) studied the neurological basis of Attention Deficit Hyperactivity Disorder. Recent estimates indicate that close to 40% of children referred to mental health clinics show symptoms of ADHD. It is more likely to occur in boys than in girls in clinical population. Boys are usually more aggressive and thus more likely to be referred.

Nolan, Gadow, Sprafkin, and Volpe (1997) studied developmental changes and gender differences in inattention and hyper-activity impulsivity. This study examined: (1) prevalence rates for the subtypes of ADHD in a non-referred sample, (2) gender differences and developmental changes in ADHD subtypes, and (3) ADHD subtypes in terms of coexisting psychiatric problems. Results had shown that gender and age were significantly related to the prevalence of ADHD. Boys had higher rates of all types of ADHD at all ages, but the gender discrepancy varied for different age groups. The minimum symptom severity score necessary for inclusion in a "risk" range for the ADHD subtypes varied according to age and gender.

ADHD as Developmental Disorder

Barkley (1995) claimed ADHD as a real developmental disorder, according to him; (i) it arises early in child development. (ii) It clearly distinguishes these children from normal children or those who do not have the disorder. (iii) It is relatively pervasive or occurs many different situations, though not necessarily all of them. (iv) It affects the child's ability to function successfully in meeting the typical demands placed on children of that age. (v) It is relatively persistent over time or development. (vi) It is not readily accountable for by purely environmental or social causes. (vii) It is related to abnormalities in brain functions and development. (viii) It is associated with other biological factors that can affect brain functioning or development.

Associated Characteristics

In addition to core problems of ADHD youth with the disorder are reported to experience more difficulties in the following areas of functioning:

Academic Functioning. Children with ADHD perform slightly lower on general intelligence tests than normal control subjects and their own normal siblings. Intellectual impairment has been linked to hyperactivity in children as young as three years of age. Academic failure is striking among youth with ADHD. It is evident by achievement test scores. School grades, failure to get promoted in school and placement in special education classes.

Gittleman et al. (1985) in a prospective study of 101 male adolescents and young adults (mean 18 years) who had been reported by their teachers to be hyperactive at age 6 to 12 years of age (mean 9 years), found that 31.5% of probands and 3% of controls met DSM-III criteria for ADHD. However, 68% of probands retrospectively reported that they have met ADHD criteria at some time during adolescence (ages 13 to 18 years). In a replication of this study, Klein and Mannuzza (1991) assessed 94 young adult males (mean age 18 years) who had been pervasively hyperactive at 5 to 11 years of age. At follow-up, 22% of probands met full DSM-III criteria for ADHD, while an additional 15% exhibited symptoms of inattention and impulsivity but not hyperactivity.

Erhardt and Hinshaw (1994) concluded that comparison group of boys had higher verbal IQ scores, higher achievement scores in mathematics than did the ADHD boys; the two groups were equivalent with respect to reading level and physical attractiveness. ADHD boys showed higher rates of non compliant disruptive behaviors, verbal aggression and physical aggression than did the comparison boys.

Common Problems of ADHD Children

A number of psychological characteristics have been associated with hyperactivity, obstinacy, stubbornness, negativism, business, bullying, increased mood liability, low frustration tolerance, temper outbursts, and low self esteem.

These characteristics may be the by product of academic and social problems frequently encountered by hyperactive children. Hyperactive children are more likely to have poor school achievement, specific learning disabilities and higher incidence of conduct disorders. Hyperactive children, especially those who are also aggressive, may have serious disturbances in their peer relations. Outcome studies have revealed that social, emotional, and conduct problems persist into young adulthood for the majority of hyperactive children (Hechtman & Weiss, 1983).

Problem with Deferred Gratification. Non ADHD children also may learn to arrange consequences to reward themselves for sticking with a difficult task. As children mature, delayed rewards become more attractive to them, and they are likely to value them and work for them more often rather than opting for smaller, more immediate rewards. ADHD children tend to opt for doing little work now for a small but immediate reward rather than doing more work now for a much bigger reward not available until much later (Barkley, 1995).

Difficulty Controlling Impulses.

Parents and teachers often describe ADHD children as “blurting out answers to questions before the questions have been finished” and “wanting what they want when they want it”. Children with ADHD have a lot of trouble waiting for things. ADHD have considerable problems with holding back their initial response to a situation. So as to think before they finally act. They often blurt out comments that they would not likely have made had they thought first. They may act likely on an idea that comes into their mind without considering that they were in the middle of doing something else that should be finished first. They are excessive and loud talkers, often monopolizing conversations.

This behavior is often viewed as rude and insensitive and has negative consequences in both the social and educational areas. Teachers of ADHD note that children often “blurt out comments without raising their hands” in class and “start assignments or tests without reading the directions carefully”. They frequently are described as “not sharing” what they have with others and of “taking things they want that don’t belong to them” (Barkley, 1995).

a. Taking Shortcuts. Problems with attention and impulse control also manifest themselves in the shortcuts that ADHD children are notorious for taking in their work. They apply the least amount of effort and take the least amount of time to perform boring or unpleasant tasks (Barkley, 1995).

b. Taking too many risks. The impulsivity seen in ADHD may also show up in greater risk taking. Failing to consider in advance harm that could follow an action may explain why people with ADHD, particularly ADHD children, some of whom are also defiant and oppositional are more accident prone than others. It is not that ADHD children do not care about what will happen it is that they simply do not think ahead about likely consequences (Barkley, 1995).

c. Money Management Problems. The impulsiveness seen in ADHD may also explain why teenagers and young adults with ADHD have greater difficulties with managing money and credit. They buy things they see and want to have on impulse without much regard for whether they can really afford it now. They do not consider what consequences buying these items will have on their weekly budget or their ability to payback the debts they already have (Barkley, 1995).

Problems with too much Behavior (Hyperactivity)

“Squirmy”, “always up and or on the go”, “acts as if driven by a motor”, “climbs excessively”, “can’t sit still”, “talks excessively”, “often hums or makes odd noises”. The excessive movement of hyperactivity is a third feature of ADHD. This feature may appear as restlessness, fidgetiness, unnecessary pacing, or other movement and also as excessive talking. Parents who consistently see their children shifting in their seats, tapping their fingers or feet, playing with their nearby objects, pacing and generally becoming quiet impatient and frustrated by waiting periods know this behavior is not normal. Children who constantly get out of their seats, wriggling or squirming when they should be sitting still, playing with a small toy brought from home, talking out of turn, and humming singing to themselves when everyone else is quite know that this behavior is not typical of most children (Barkley, 1995).

a. ADHD Children are Hyper Responsive. ADHD children move about too much it is that they behave too much. They are much more likely to respond to the things around them in any situation than are ADHD children of the same age. The behavior occurs too quickly, too fearfully, and too easily in situations where other children would have been more inhibited. A better term for describing ADHD children is hyper responsive. Such children are certainly more active than non ADHD children.

Hyperactivity and the impulsiveness seen in ADHD children are part of the same underlying a problem with inhibiting behavior. James (1950) said “it is not possible for humans to pay attention to any one thing for more than a few seconds. All of us keep adjusting our eyes and our bodies as we attend to things and often look away from things briefly before returning the urge to break off our attending to the task to do something else that creates our sustained attention. The ability to keep returning attention to something requires that a person also be able to inhibit urges or tendencies to do other things. The problem with sustained attention in those with ADHD may actually be part of their problem with inhibiting responses to things around them.

Those with ADHD find it more difficult to resist distracting temptations and to sustain this type of inhibition over urges to do other things while they are working on a lengthy task.

b. Difficulty following instructions. This inattentiveness is that others frequently have to remind those with ADHD of what they are supposed to be doing. Those who supervise the child with ADHD end up frustrated and angry. The ADHD children may fail, be retained in grade, and eventually drop out. According to Barkley (1996) difficulties with following rules and directions are related to the underlying problems with the impulsiveness. It is clear whether the impulsiveness creates the problems by disrupting the rule following when urges to switch to competing activities arise or the impulsiveness steams from an impaired ability of language to guide and control or govern behavior.

c. Doing work inconsistently. ADHD children work inconsistently. Because most ADHD children are of average or greater intelligence, their ability to produce consistently acceptable work often perplexes those around them. The problem is not that they can not do the work but that they can not maintain this consistent pattern of work productivity is a by product of other symptoms, particularly of the core impairment of impulse control. Consistent work productivity demands the ability to inhibit impulses to engage in other, more immediately fun or rewarding activities, so the more limited and erratic one's impulse control is the more variable will be his or her work productivity (Barkley, 1995).

Theory, Etiology, Diagnosis and Treatment of ADHD

Theories Related to ADHD

Many different theories of ADHD have been proposed over the past century to account for the diversity of findings.

Douglas Theory of Self-Regulation. Douglas (1972) proposed theory of different attention, inhibition, arousal and preference for immediate reward, and the attempts to view ADHD as a deficit in sensitivity to reinforcement or rule-governed behavior (Haenlein & Caul, 1987).

Douglas as cited in (Marsh & Terdal, 1997) would eventually come to theorize that the disorder was comprised of four major deficits, these being in (i) the investment, organization and maintenance of attention and effort, (ii) the ability to inhibit impulsive behavior, (iii) the ability to modulate arousal levels to meet situational demands, and (iv) an unusually strong inclination to seek immediate reinforcement.

Barkley's Theory. Barkley (as cited in Barkley & Marsh, 1996) conceptualization broadly links behavioral inhibition to executive functions and self-regulation. It applies only to cases in which hyperactivity/impulsivity are observed.

Behavioral inhibition is central in this model it is critical to the performance of other executive functions. These other executive functions influence the motor control of behavior. Behavioral inhibition consists of three abilities. First is the ability to inhibit likely responses from occurring in the situations, second is the ability to inhibit ongoing responses. These two inhibitory functions assure a span of time during which the executive functions can be employed for self-regulation. The third inhibitory ability is the ability to protect the executive functions against interference from other executive events so that they can operate. In these ways, a behavioral inhibition facilitates the working of the executive functions.

Barkley (as cited in Nelson & Israel, 2000) proposed four executive functions, each of which has several elements. They are briefly noted as follows:

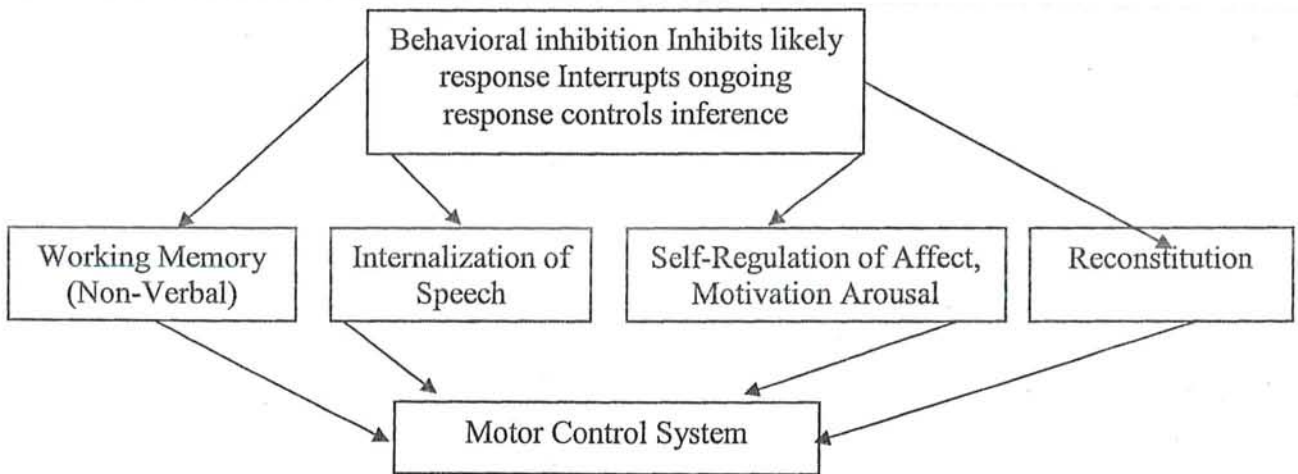


Figure 1: Barkley's Model of ADHD (Barkley, 1997)

- Working memory allows information to be held in mind so that it may be considered.
- Initialization of speech facilitates mental reflection on rules and instructions to guide behavior.
- Self-regulations of affect and motivation allow control of the emotions and motivations and make it possible for them to be redirected.
- Reconstitution permits analysis and synthesis of experiences and creative thinking.

These creative functions provide the means for the individual to self-regulation of his/her behavior. When inhibition is disordered, self-regulation is adversely affected. On the basis of evidence about brain functioning, Barkley proposed that a disturbance in the frontal areas of brain is responsible for inhibitory abnormality (Nelson & Israel, 2000).

The model of ADHD set forth places behavioral inhibition at a central point in its relation to four other executive functions dependent upon it for own effective execution. These four executive functions permit and sub serve human self-regulation bringing behavior progressively more under control of time and the influence of future over immediate consequences.

Several assumptions are important in understanding the model as it applied to ADHD.

1. The capacity for behavioral inhibition begins to emerge first in development, ahead of these four executive functions.
2. These executive functions emerge at different times in development, may have different developmental trajectories and are interactive.
3. The impairment that ADHD creates in these executive functions is secondary to the primary deficit it creates in behavioral inhibition.
4. The deficit in behavioral inhibition arises principally from genetic and neuron developmental origins rather than purely social ones, although its expression is certainly influenced by social factors over development.
5. The secondary deficits in self-regulation created by the primary deficiency in inhibition feedback to contribute further to poor behavioral inhibition given that self-regulation contributes to the enhancement of self restraint.
6. The model does not apply to those having ADD without hyperactivity or what is now called ADHD, predominantly inattentive type.

Behavioral inhibition is viewed as consisting of two related processes: (i) The capacity to inhibit prepotent responses either prior to their initiation or once they are initiated and thus to create a delay in the response to an event (response inhibition), and (ii) The protection of this delay, the self directed actions occurring within it, and

the resulting goal-directed behaviors from interference by competing events and their prepotent responses (interference control). Through the post potent of the prepotent response and the creation of this protected period of delay, the occasion is set for four other executive functions to act effectively in modifying the individual's eventual response.

Prolongation/Working Memory

The capacity to inhibit an initial proponent response to an event creates a delay in responding Bronowski (as cited in Barkley & Marsh, 1996). The capacity for inhibition to preclude the initiation of movements located in neural zones adjacent to those being activated (Fuster, 1989).

As applied to ADHD the model stipulates that those with the disorder should display greater difficulties with the development of motor coordination and especially in the planning and execution of complex, lengthy and novel chains of goal-directed responses. There is substantial evidence already available for problems in motor development and motor execution in those with ADHD (Barkley, 1997). It remains to be determined whether those with ADHD have more difficulties in producing, executing and sustaining lengthy and complex chains of novel responses towards goals.

The model portrayed in the figure represents behavioral inhibition as a central and fundamental component in a theory of executive functions. In behavioral inhibition efficient execution of four executive functions or self-directed actions is necessary which permit self-regulations.

1. Prolongation/working memory
2. Self regulation of effect
3. The internalization of speech
4. Reconstitution

The impairment in behavioral inhibition occurring in ADHD is hypothesized to disrupt the efficient execution of these four executive functions thereby delimiting

the capacity of these individuals for self-regulation. The result is impairment in the cross temporal organization of behavior (Barkley & Marsh, 1996).

Etiology of ADHD

Throughout the history of the disorder there has been a tremendous amount of scientific and public controversy about the causes of ADHD. It can be caused by damage to the frontal part of a child brain during development. There is a consistent relationship between a potential causal agent and ADHD or the behavior problems characteristic of it. Smoking by mothers during pregnancy is associated with an increased risk of hyperactivity and inattention in the offspring of that pregnancy.

The role of brain injury is also considered another cause of ADHD. Neurological etiology is suggested by under activity in certain areas of the brain that are involved in inhibitory responses, attention processes and sensitivity to reinforcement. ADHD occurs more frequently in family members of persons with the disorder, therefore supporting a hereditary component. Symptoms of ADHD occur more frequently in children who have been exposed to prenatal insult, obstetrical complication or high levels of lead. Environmental factors, such as poor parenting or educational practices, do not cause ADHD but may exacerbate the symptoms (Barkley, 1990).

Neurological Factors

ADHD is caused by abnormal development or injury of the brain. There are striking similarities in behavior problems between children with ADHD and people who had suffered damage by injuries to the front part of the brain, just behind the forehead, known as the orbital frontal region. This brain region is one of the most well developed in humans compared to other animals and is believed to be responsible for inhibiting behavior, sustaining attention, employing self control, and planning for the future (Barkley, 1995).

Neurological imbalance or deficiencies may also play a causal role. More specifically, there may be abnormalities in one or more of the monoaminergic systems, involving either dopamine or nor epinephrine mechanisms.

Brain Structure and Activity. Various parts of the brain have been hypothesized as the site of dysfunction in ADHD, but most interest has focused on the frontal lobes. Damage to frontal lobe has long been associated with symptoms found in ADHD. Of importance is that the frontal are as are also thought to be involved in attention, executive functions, and motor functions. The corpus collosum (fibers by which the two hemispheres communicate of memory) are sometimes smaller than average (Tannock, 1998).

Genetic Factors. Genetic factors may also involve in the etiology of ADHD. There is a higher rate of ADHD among the natural parents and extended biological relatives of children with ADHD (Biederman, Munir, & Knee, 1987; Cantwell, 1985).

Twin studies provide clearer evidence of inheritance. Turner (1989) found that concordance rates for behavioral deviance were significantly higher in monozygotic than in dizygotic twins, especially boys.

Studies of twins are even more persuasive. Scientists have found that if one twin has symptoms of ADHD the risk than the other will have the disorder is as high as 80to 90%. About 70% of identical twins had ADHD when one of the twin shad already had been diagnosed. For fraternal twins the figure was only 32%but that is still 6 to10 times greater than that seen among unrelated children, where the prevalence of ADHD is only 3to 5% (Barkley, 1996).

Pregnancy and Birth Complications. The popular idea that ADHD is traceable to pregnancy and birth complications has not received strong support (Goodman, Stevenson & Whalen,1989). In an extensive study that followed 1,500 women from pregnancy to the time their children were seven years old, alcohol used was linked to activity level attention deficits and difficulties in organizing tasks.

Children born prematurely and of very low birth weight indicate risk for attention problems and hyperactivity/impulsiveness.

Parental maternal alcohol consumption and tobacco smoking also put children at risk. In an extensive US study the followed women from pregnancy to the time their off springs were fourteen years old, parental alcohol use was linked to activity level attention deficits and difficulties in organizing tasks.

Maturation Lag. Delay maturation of unknown origin is associated with ADHD symptoms. Weithorn (as cited in Turner, 1989) compared measures of impulsivity in hyperactive and control children and discovered more similarity in performance between older hyperactive and younger non-hyperactive boys of same age. Butter and Lapierre (1974) found that hyperactive children aged 6 to 12 years were 18 to 24 months less mature than were the children in the control group. All these findings were consistent with hypotheses of developmental lag or maturational delay.

Oxygen Deprivation. Hypoxia (low oxygen) and anoxia (the lack of oxygen) have been significantly associated with later behavioral disturbance. Oxygen deprivation around the birth period is a frequent precursor of minimal or more extensive brain damage, but the lack of oxygen at any age can cause damage to neural tissue.

Of the 673 children admitted to a children's psychiatric hospital a large number had suffered oxygen deprivation at birth in early infancy or later because of whooping cough. Compared with a control group at the same psychiatric center who had no history of oxygen insufficiency, the 297 children who had such characteristics, which are typical of ADHD, hyper motility, impulsivity, unpredictable variation in mood, a short attention span, a fluctuating ability to recall material previously learned, and difficulty with arithmetic (Rosenberg & Brodley, 1984).

Body Chemistry. Walker and Roberts (1992) stated in a study of urinary excretion of phenyl ethylamine (PEA) in ADHD and control children suggested that

PEA, an endogenous (existing within the body naturally) amphetamine like substance is abnormally low in children with ADHD.

Head Injury. A history of head injury is more common in children in the general population. Rutter, Chadwick, and Shaffer (as cited in Turner, 1989) found that severe head injury caused behavioral sequel but that mild head injury did not. Certain symptoms of ADHD were commonly noted following head injury, such as over activity, over talkativeness, aggression, impulsivity, inattention and poor control of emotions, antisocial behavior, and social disinhibition (including such behaviors as undue outspokenness without regard for social convention, frequently asking embarrassing questions and making personal remarks) is the one psychiatric manifestation that typifies the post head injured person. Socially inappropriate behavior is specific to head injury and is characteristic of ADHD (Lewis, Shanok, & Balla, 1979).

Exposure to Lead. Nathanson and Bloom (as cited in Turner, 1989) described substances that are well known to be toxic to humans, particularly lead have been implicated in the etiology of ADHD. Lead is stored in the bone, liver, muscle, kidneys and brain, where it interferes with the action of certain enzymes that are necessary for the transmission of nerve impulses.

Scientific evidence has proved that high levels of lead in the body of young children may be associated with a higher risk for hyperactive and inattentive behavior. This relationship seems to exist especially when the lead exposure occurs between 12 and 36 months of age. The relationship is rather weak, although it is found consistently in many studies.

Barkley (1977) found that less than 36% children with elevated lead levels were rated by teachers as inattentive, distractible, impulsive and hyperactive. High levels of lead in the body may well cause ADHD because animal and human studies do show that lead exposure at moderate to high levels injures brain tissue.

Environmental Circumstances. A few environmental theories have been proposed to explain ADHD but these have not received much support in the research

literature. There would seem to be little justification for claiming that poor parenting, chaotic home environment or fast-paced lifestyles are in any way causally related to ADHD.

Poor Parenting. Anderson, Hinshaw, and Simmel (1994) conducted a study on other child interactions in ADHD and non ADHD boys. Overt and covert externalizing behavior was studied. Reciprocal relationships between child characteristics and such familial factors as parental psychopathology and interaction style with the child characterized the development and maintenance of ADHD as well as the co morbidity with antisocial behavior. The goal was to ascertain the ability of negative maternal behavior exhibited during mother-child interactions to predict independently observed overt and covert externalizing behavior in children.

Rating Scale (DuPaul, Rapport & Perriello, 1991) collects information on the Child's academic and learning skills and performance. The scale has good reliability and can differentiate between students with and without classroom behavior problem. The scale taps academic competencies rather than behavioral deficits and provides information that is not obtained through other rating scales or direct observation. It is a useful supplement to a teacher interview and inspection of the child's schoolwork. Curriculum-based measurement of the child's academic skills may be useful in determining the child's academic level and the appropriateness of the current academic placement (Shapiro, 1996).

Interventions for ADHD Children

Brown (2000) studied the Diagnosis and Treatment of Children and Adolescents with Attention Deficit Hyperactivity Disorder. Major intervention strategies appropriate for school and community settings are outlined. ADHD is one of the most common reasons for referral in both school and community agencies, it is important that clinicians be prepared to provide accurate diagnosis and intervention recommendations. There is widespread agreement that intervention for the child or adolescent with ADHD should multimodal, multidisciplinary and of long duration (Goldstein, 1996). Although ADHD is presumably a biologically based disorder, alteration of environmental conditions can enhance the functioning of children with

this disorder. It is important to make certain that treatment brings about changes in the child's most problematic areas of functioning. The counselor child considers the following interventions in developing a comprehensive treatment program for the child with ADHD.

Parent Counseling and Training. Educating parents about ADHD and effective management strategies is a standard practice American Academy of Child and Adolescence Psychiatry (AACAP, 1997). Barkley (1997) developed parent and child comprehensive training program to reduce the negative interactions between parents and child.

Client Education. Providing information to children who have ADHD is an important part of the intervention process (AACAP, 1997). Levine (1990, 1993a, 1993b) has developed novel materials to help children with all types of learning disorders better understand their disorder and how they can take charge of improving their lives. Counselors can use these materials to help children with ADHD recognize that all persons have strengths and limitations. Children can develop an understanding of how attention, memory and learning processes work and learn effective ways to enhance their learning and academic performance. Children are encouraged to identify their strengths and use them to compensate for those areas in which they have difficulty.

Individual and Group Counseling. Traditional counseling and psychotherapy, including play therapy have not proven successful in remediation of the core deficits of ADHD (DuPaul & Stoner, 1994). However, many children have the experience of repeated failures, social rejection and feelings of helplessness as a consequence of ADHD (Goldstein & Goldstein, 1990). Counseling can provide a setting in which children can feel understood, reduce their sense of helplessness and develop increased motivation.

Psychopharmacological Interventions. Medication often results in increased attentiveness and decreased impulsivity and over activity. However, while medication decreases inappropriate behavior it does not improve appropriate behavior without additional intervention directed to building requisite academic and social behavior (Swanson, McBurnett, Christian, & Wigal, 1995). Stimulant

dedications, such as methylphenidate (Ritalin) dextroamphetamine (Dexedrine), and pemoline (Cylert), are usually the first medicating choices for ADHD (Julien, 1998; Rosenberg, Holttum, & Gershon, 1994). Methylphenidate and dextroamphetamine have a rapid onset and short duration of effect and are usually given in two or three doses per day (Cherkes, Julkowski, Sharp, & Stolzenberg, 1997).

Stimulant Treatment. Stimulant treatment for children with ADHD has not been without controversy. The use of stimulants has steadily increased from 1960 until the present time (Safer, 1997), leading some to question whether stimulants are being over-prescribed. Hoza and Pelham (as cited in Ammerman, Last, & Hersen, 1993). The decision to prescribe stimulant medication is often made unsystematically, which can lead to an inaccurate diagnosis of ADHD and an erroneous decision to medicate the child.

Systematic, comprehensive diagnostic evaluation leads to more accurate diagnosis and more appropriate use of stimulant medication. Not all children with ADHD need to take medication and the decision to use it depends on the severity of symptoms; the coping abilities of the child, the parent, and the school; and the availability and success of other interventions.

There have also been concerns about the potential for abuse of the stimulant medications. Although stimulant medication is quite effective for most children with ADHD, 10% to 30% of children may not respond to treatment using stimulants (Julien, 1998). A variety of medications have been used in conjunction with, or instead of psycho stimulants.

Selective serotonin reuptake inhibitors (such as fluoxetine or Prozac) and the non-tricycles antidepressant bupropion (Wellbutrin) have also been reported to be helpful for children who do not respond to stimulant medication. Clonidine (Catapres), an antihypertensive, and the antiseizure medication carbamazepine (Tegretol) have also been used in combination with, or as alternatives to, stimulant medication (Julien, 1998), especially when aggression or irritability is present (Cherkes-Julkowski, Sharp, & Stolzenberg, 1997).

School Interventions. Academic interventions are frequently warranted for

children with ADHD. Counselors may not have primary responsibility for developing and implementing academic interventions but will want to be sure that these interventions are included in the comprehensive intervention plan. The first step is to provide the teacher with the knowledge and training necessary to provide the individualized attention that is usually necessary to best help the ADHD child in school. Alterations to the classroom environment, such as changes in the pace, presentation, or level of instruction to make the classroom environment a better match for the needs of the student, along with implementation of behavior support programs are usually helpful.

Regular contacts between the counselor and school personnel over a relatively long period of time provide maximum cooperation and success in working together. The counselor should provide sufficient social reinforcement for the teacher, particularly in the beginning stages of intervention, after which the child's improved performance will help reinforce teacher effort (Abramowitz & O'Leary 1991; DuPauf & Stoner, 1994; Piffner, 1996).

Treatment of Attention Deficit Hyperactivity Disorder

Hall and Gushee (2000) studied diagnosis and treatment with Attention Deficit Hyperactive youth. According to them ADHD can cause behavioral and academic problems for youth and can lead to problems in school. School counselors are routinely expected to provide mental health interventions, and school personnel logically look to mental health counselors for answers to school problems.

Behavior Techniques. Behavior techniques are evident in the use of a daily report card, token economies, class rules, time out, feed back of positive and negative behaviors, a homework notebook, and relaxation training to control anger (Dulcan, et al., 1997). Specifically, mental health counselors can teach school counselors to focus on academics, behavior, and peer relationships.

For example, school counselors can be encouraged to ask teachers to seat an ADHD child in front of a structured classroom so the child experiences less distraction and can better focus on relevant matters. In addition, school counselors

can be encouraged to help teachers and parents develop well-organized schedules with clearly defined rules that are then enforced, so that the child has a more predictable life (Cantwell, 1996).

For example, school counselors can be encouraged to arrange to have a daily note sent home providing feedback on the ADHD child's behavior, daily homework, or other necessary information (Lavin, 1997). The school counselor can be shown ways to aid the teacher in creating individually adapted checklists' that address a child's specific needs (such as daily behavior and homework), which the teacher would sign each day for the child to take to caregivers. Parents can award tokens if the checklist is brought home or if the child demonstrated improved behavior in specific target areas. Daily notes can later be substituted with weekly checklists to encourage emerging autonomy and responsibility.

ADHD Children at School

Schools represent the major activity of childhood. For formative years the average child spends seven or more hours a day, for approximately 186 days a year, at school. For majority of children the total school experience is the most important socialization force encountered outside of the family (Ross, 1980). There is general consensus concerning the importance of the school's role in the socialization process.

Once ADHD children enter school, a major social burden is placed on them that will last at least the next 12 years. It will prove to be the major area of impact of their handicapping condition and will create the greatest source of distress for many of them. The abilities to sit still, attend, listen, obey, inhibit impulsive behavior, cooperate, organize actions, and follow through on instructions as well, to share play well, and interact pleasantly with other children are essential negotiating a successful academic career.

By later childhood and preadolescence, patterns of social conflict are well established for many ADHD children. Between 7 and 10 years of age at least 30% to 50% are likely to develop symptoms of conduct disorder and antisocial behavior such as lying, petty thievery and resistance to authority. Twenty five percent or more

may have problems with fighting with other children.

Ross (1980) has stated that the hyperactive child generates changes in his/her behavior settings, which in turn have an impact on his/her, own subsequent behavior. The hyperactive child is more active and disruptive during classroom activities than are his non hyperactive peers and his restlessness and disruptiveness continue into adolescence.

According to Barkley (1995) ADHD children seem to have at least two main problems with academic work:

- (i) They are not getting as much done as other children or as would be expected from their known abilities and so have lower grades and are retained more often in their grade level.
- (ii) Their ability levels are also some what below those of non ADHD children and may even decline some what over their years in school.

Normal or healthy development is defined in terms of a series of interlocking, social, emotional, and cognitive competencies (Waters & Sroufe, 1983), Competence at one period of development, which tends to make the individual broadly adapted to the environment, prepares the way for the formation of competence at the next (Sroufe & Rutter, 1984). Moreover, normal development is marked by the integration of earlier competencies into later modes of functioning.

Pathological development may be conceived of as a lack of integration of the social, emotional, and cognitive competencies that are important to achieving adaptation at a particular level (Cicchetti & Schneider, 1984). Therefore an early deviation or disturbance in functioning may ultimately cause the subsequent emergence of much larger disturbance.

Academic Performance

Academic performance and its relation with ADHD will be also the focal point of the present study. Schwiebert, Sealander, and Bradshaw (1998) described that 80% of children who perform below; their academic ability is disrupted because of ADHD. At higher risk of school failure, these children may need help with oral expression, listening comprehension, written expression, reading skills, social interaction, problem solving and organizational skills.

Beitchman, Cohen, Konstantareas, and Tannock (1996) studied children with ADHD are at high risk for poor cognitive functioning as measured by grade repetitions, academic underachievement, placement in special classes, need for tutoring and impaired performance on neurological measures (Weiss & Hechtman. 1979; Silver, 1981; Levine & Bush, 1982; Edelbrock & Costello, 1984; Lahey & Schaugency, 1984; Cantwell, 1985; Barkley, 1990).

Fischer, Barkley, Edelbrock, and Smallish (1990) studied the Adolescent outcome of hyperactive children diagnosed by research criteria: Academic, Attention. And Neuropsychological status. One hundred hyperactive children meeting research diagnostic criteria and 60 community control children were followed prospectively over an 8 year period into adolescence.

Younger (12-14 years) and older (15-20 years) groups were tested on measures of academic skills, attention and impulse control, and select frontal lobe functions. At follow up, hyperactive Ss demonstrated impair attention, and impulse control, and greater off task, restless and vocal behavior during an academic task, compared with control Ss, the limited set of frontal lobe measures did not differentiate the groups. Age did not interact with group membership. However several measures showed age related declines in both groups. It is concluded that hyperactive children may remain chronically impaired in academic achievement. Inattention and behavioral disinhibition well into their late adolescent years.

Hall and Gushee (2000) conducted a study on the diagnosis and treatment with Attention Deficit Hyperactive youth. They investigated that ADHD can cause

behavioral and academic problems for youth and can lead to problems in school. Mental health counselors can serve as consultants to school personnel, including school counselors, teachers and principals; Mental health counselor~ know that ADHD is a public health problem resulting in a degree of morbidity and disability of children. Adolescents and adults and ADHD symptom result in stress to families, schools and individuals.

Social difficulties are increasingly viewed as central to the psychopathology of ADHD (Barkley, 1990; Hinshaw & Mchale, 1991; Whalen & Henker, 1985) and may figure prominently in the generally poor long term outcomes experienced by these children (Klein & Mannuzza, 1991; Weiss & Hechtman, 1986).

Rationale of the Present Research

Attention Deficit Hyperactivity Disorder prevents children from keeping their mind on particular task. It seriously curtailed the ability to concentrate on the tasks. There was much functional impairment associated with the disorder including academic underachievement, attention problem, and antisocial behavior. In academic, the effects of ADHD are significant. Children with ADHD in middle childhood continue to demonstrate difficulties with peer relations, impulsivity (poor self control), and inadequate delay skills (easily frustrated). These deficiencies are prominent in school.

In Pakistan, it is felt that there are many cases in which children experiences low academic performance and neither their parents nor their teachers always know the reasons. Teachers hold parents responsible for the poor performance of their children and parents blame teachers for not paying appropriate attention to their children. Thus, it was felt by the researcher that an effort should be the other factors that are conducted to play because of the irresponsibility of parents and teachers but are may be because of the children's own behavioral problems. In western countries such as America 3 to 5% children in the middle childhood i.e., 6 to 12 years of age suffer from Attention Deficit Hyperactivity Disorder and because of this disorder they experience low academic grades (Barkley, 1995). In Pakistan, unfortunately the exact ratio of children suffering from ADHD is still unknown and unexplored.

Walker and Roberts (1992) described that children of the younger age group exhibit more primary behavior symptoms of Attention Deficit Hyperactivity Disorder, which are inattentive, hyperactive and impulsive. Children with ADHD frequently display problems related to behavior, emotional functioning, academic performance, and cognitive, and language abilities.

Attention Deficit Hyperactivity Disorder not only affects the academic performance of the children but also causes associated behavior problems that include aggressive and antisocial behavior, social problems including poor interpersonal skills that involve negative social interactions, and deficits in self-management skills. The objective of the present research is also to screen out children suffering- from Attention Deficit Hyperactivity Disorder from schools and to explore whether there is any relation between low academic performance and ADHD.

METHOD

METHOD

Objectives

The present research has the following objectives.

1. To screen out children suffering from Attention Deficit Hyperactivity Disorder (ADHD) from different schools of Islamabad and Rawalpindi.
2. To find out gender differences on scale with respect to ADHD.
3. To explore the factors that might be associated with the ADHD.

Sample

For the present research it was primarily decided that the total number of contacted children will be 500. The screened out children would be included for analysis in the present study. The age range of the sampled population was 7-12 years. Schools were selected on the basis of random sampling.

Instrument

Disruptive Behavior Rating Scale. The Disruptive Behavior Rating Scale was developed by Barkley (1997). It was used to measure disruptive behavior in children. It is a parent and teacher reported scale that contains eight sub-scales. The description of the scales is as follows:

1. School Situations Questionnaire.
 - Items = 12
 - Response Categories = Yes/No, 1,2,3,4,5,6,7 (whereas 1=low & 7=high)
2. Health History Questionnaire.
 - Items = 23

- Response Categories = Never, Past, Present
3. Pregnancy and Birth Problem Questionnaire.
 - Items = 12+10=22 (whereas 12 items for pregnancy related problems and 10 items for birth related problems)
 - Response Categories = Yes/No
 4. Child Temperament Questionnaire.
 - Items = 10
 - Response Categories = Yes/No
 5. Basic Milestones Questionnaire.
 - Items = 6
 - Response Categories = Months/Years

Demographic data sheet also included. Respondents are asked to rate items on the behalf of their children. Response categories are different for each sub-scale item. Scores on all items is summed to get a total score. Studies carried out by other researchers reported the reliability of the scale. For example, Bradley (1996) reported ‘excellent’ reliability for the mother reported DBRS-P. He concluded that the subscales oppositional, distractibility and impulsive/hyperactivity had good test-retest reliability. The present study utilizes the translated and adapted version of the ‘Disruptive Behavior Rating Scale’. It has been translated by a PhD student at National Institute of Psychology (Malik, manuscript in preparation).

Procedure

The data was collected from different schools of Islamabad & Rawalpindi. Permission to collect data was sought from the concerned authorities of institutions (principal). Teachers of classes 2-5 were instructed about the use of the disruptive behavior rating scale (Barkley, 1997). They were taught how complete the “School Behavior” components of the scale. The purpose of the research was also clarified. The teacher identified children in their classes who exhibited ADHD type and behavior.

Parents of the identified children were contacted and requested to come to the school. The researcher met the parents. The purpose of research was explained and *parents were asked to fill in the response categories of the scale* so majority of questionnaires were collected immediately by the researcher. Some parents requested to take the questionnaire home. These were returned to the teacher, who then gave them to the researcher.

RESULTS

RESULTS

The present aims to identify and understand the prevalence of ADHD in Rawalpindi and Islamabad. To analyze data, descriptive statistics was used percentages and frequencies with charts were calculated by using SPSS 13.0.

Disruptive Behavior Rating Scale (Barkley, 1997) was used to identify 500 students who were contacted out of which 44 students (8.8% of the population) were identified. In which there were 36 boys (7.2%) and 8 girls (1.6%). The distribution of scores with respect to the sub-scale is given below:

Table 1

School wise distribution of the sample (N=44)

| Schools | Boys | Girls | Total |
|---------|------|-------|-------|
| A | 15 | 3 | 18 |
| B | 2 | 3 | 5 |
| C | 4 | - | 4 |
| D | 5 | - | 5 |
| E | 10 | 2 | 12 |

Note: A= Rainbow Public School, B= Islamia High School, C= Islamabad College of Arts and Science, D= St. Mary Cambridge School, E= Division Public School and College

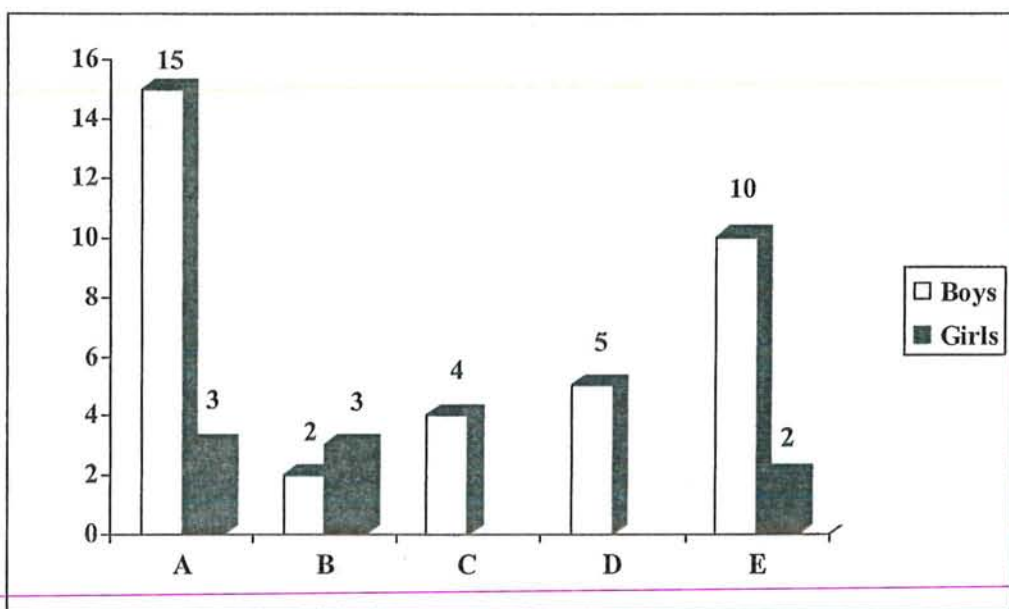


Figure 1. Graphical Representation of School wise Distribution of the sample

Table 1 and figure 1 shows detail of screened out children from schools of Islamabad and Rawalpindi. Total no of children were 44 out of 500 contacted sample. The ratio of boys was high as compared to girls.

Table 2

Age wise distribution of the sample (N=44)

| Age | <i>f</i> | <i>P</i> |
|-----|----------|----------|
| 6 | 1 | 2.3 |
| 7 | 3 | 6.8 |
| 8 | 12 | 27.3 |
| 9 | 19 | 43.2 |
| 10 | 6 | 13.6 |
| 11 | 2 | 4.5 |

Note: - Missing value=1

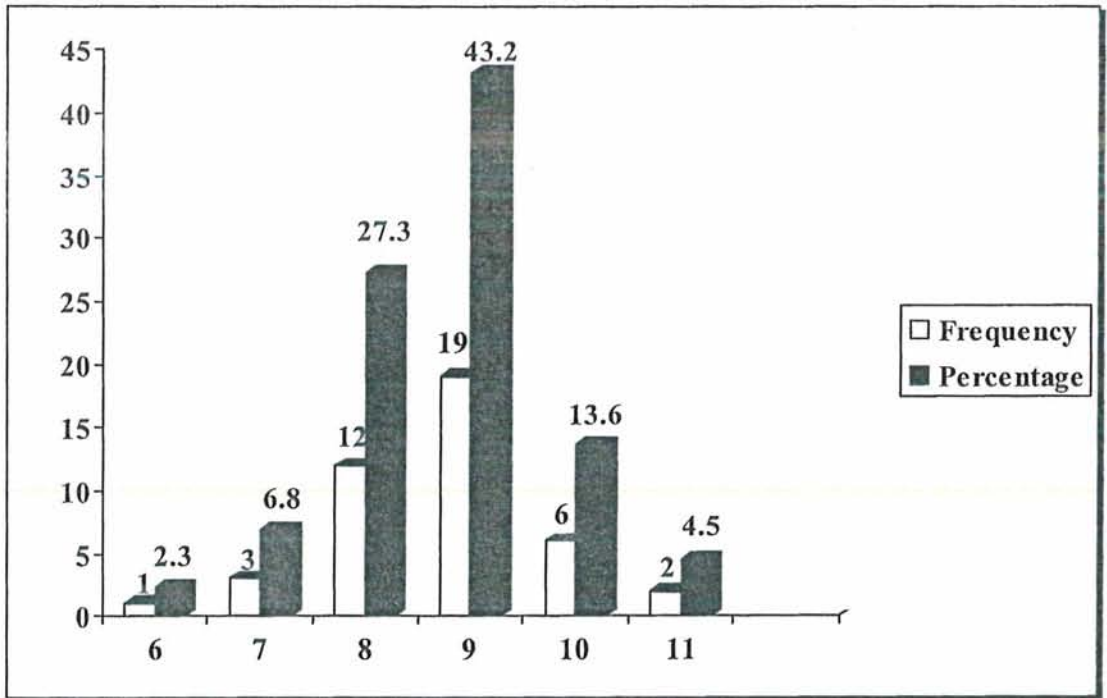


Figure 2. Graphical Representation of Age wise Distribution of the sample

Table 2 and figure 2 shows age categories of children. There were six categories in which severity of problem lies at the age of 9 with the intensity of 43.2% and minimum is 2.3% at the age of 6. The missing value is 1 with 2.3% that means it was unreported.

Table 3

Gender wise distribution of the sample (N=44)

| Gender | <i>f</i> | <i>P</i> |
|--------|----------|----------|
| Boys | 36 | 81.8 |
| Girls | 8 | 18.2 |

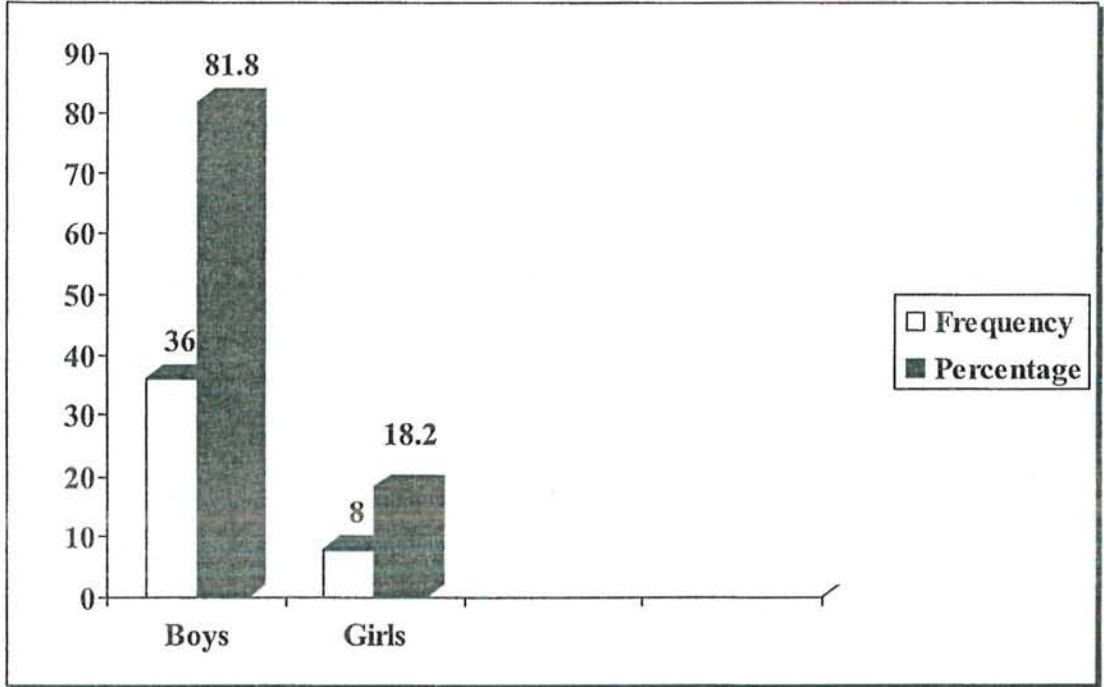


Figure 3. Graphical Representation of Gender wise Distribution of the sample

Table 3 and figure 3 shows gender difference in which 81.8% of boys were identified as problematic that was very high as compared to girls that was 18.2%. It means there is significant disparity in the number of reported cases between genders.

Table 4

Class wise distribution of the sample (N=44)

| Class | <i>f</i> | <i>P</i> |
|-------|----------|----------|
| 2 | 7 | 15.9 |
| 3 | 19 | 43.2 |
| 4 | 14 | 31.8 |
| 5 | 3 | 6.8 |

Note: - Missing value=1

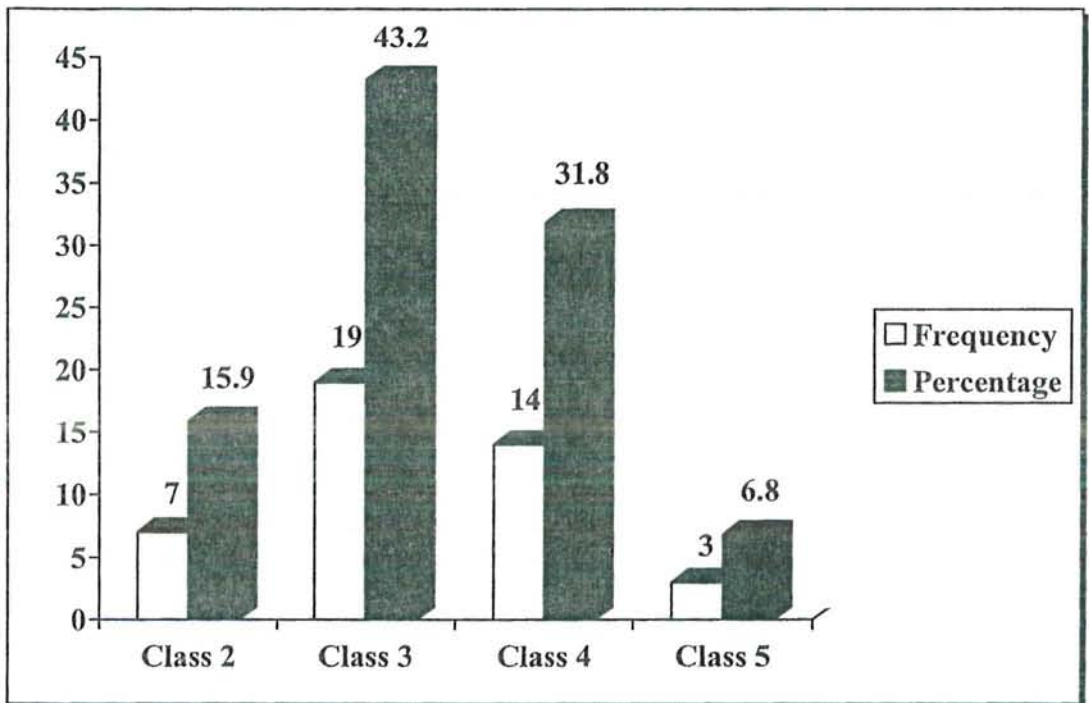


Figure 4. Graphical Representation of Class wise Distribution of the sample

Table 4 and figure 4 shows class categorization of children. There were four categories and problem was high in intensity in class 3 with 43.2% and it was low in class 5 with 6.8%. The missing value was 1(2.3% of the total reported cases).

Table 5

Father's education wise distribution of the sample (N=44)

| Father Education | <i>f</i> | <i>P</i> |
|------------------|----------|----------|
| Matric | 13 | 29.5 |
| F.A./F.Sc. | 14 | 31.8 |
| B.A./B.Sc. | 16 | 36.4 |

Note: - Missing value=1

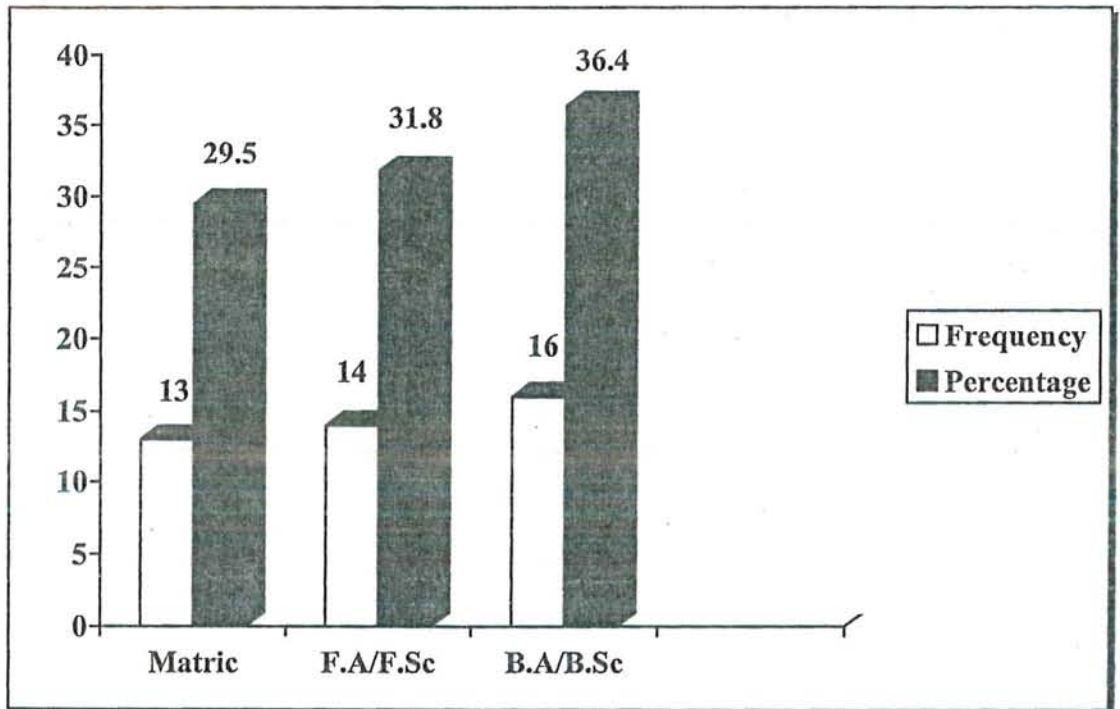


Figure 5. Graphical Representation of Father's Education wise Distribution of the sample.

Table 5 and figure 5 shows father's education. It describes three categories, Matric, F.A./F.Sc and B.A./B.Sc, in which most of the parents are educated about 36.4% and minimum education is 29.5% and missing value is 1, which was unreported.

Table 6

Father's occupation wise distribution of the sample (N=44)

| Father Occupation | <i>f</i> | <i>P</i> |
|-------------------|----------|----------|
| Private | 27 | 61.4 |
| Government | 13 | 29.5 |

Note: - Missing value=4

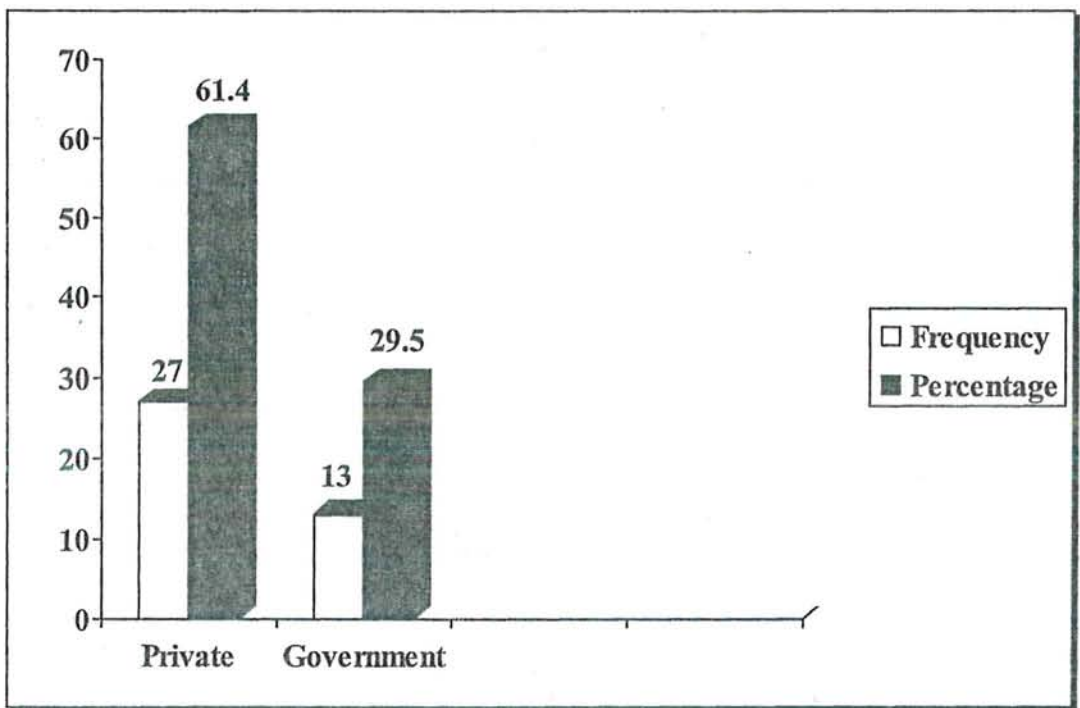


Figure 6. Graphical Representation of Father's Occupation wise Distribution of the sample.

Table 6 and figure 6 show father's occupation. There were two categories private and government. The percentage was high in private sector with 61.4% and frequency was 27 as compared to government sector where percentage was 29.5% and frequency was 13. The missing value was 4, which mean 9.1% was unreported.

Table 7

Mother's education wise distribution of the sample (N=44)

| Mother Education | <i>f</i> | <i>P</i> |
|------------------|----------|----------|
| Primary | 2 | 4.5 |
| Middle | 7 | 15.9 |
| Matric | 12 | 27.3 |
| F.A./F.Sc. | 18 | 40.9 |
| B.A./B.Sc. | 3 | 6.8 |

Note: - Missing value=2

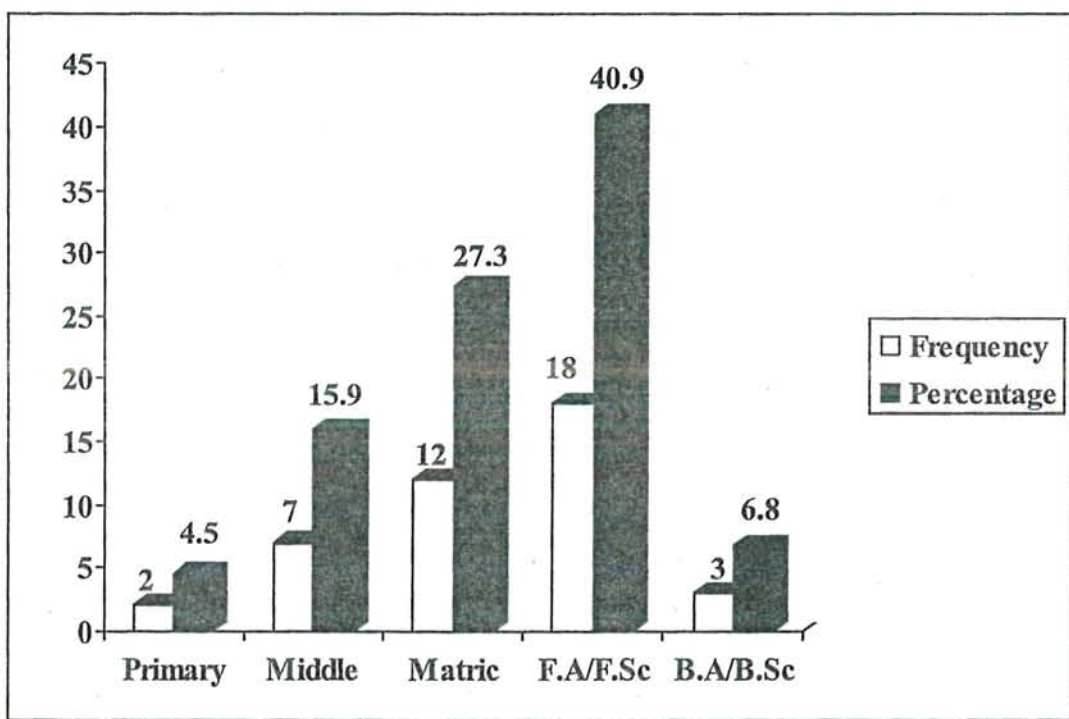


Figure 7. Graphical Representation of Mother's Education wise Distribution of the sample

Table 7 and figure 7 show mother education. There were 5 different categories and the intensity was high at F.A./F.Sc level with 40.9% and frequency was 18 whereas it was low at primary level with 4.5% and frequency was 2. The missing value was 2 that were unreported.

Table 8

Mother's occupation wise distribution of the sample (N=44)

| Mother Occupation | <i>f</i> | <i>P</i> |
|-------------------|----------|----------|
| Private | 3 | 6.8 |
| Government | - | - |

Note: - Missing value=41

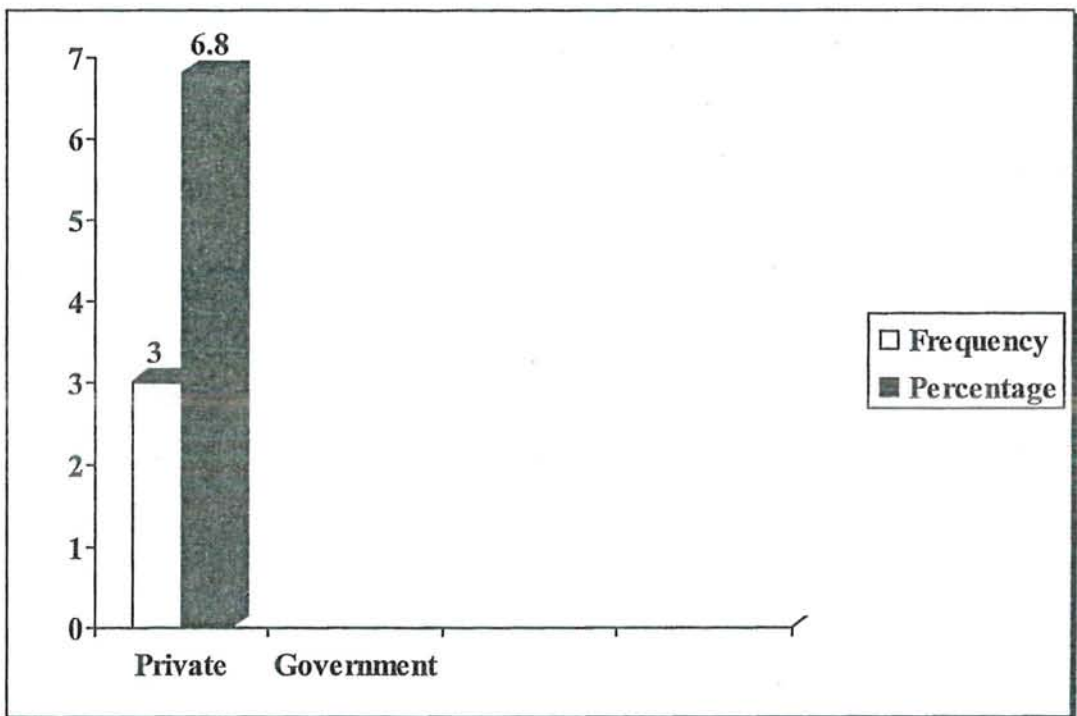


Figure 8. Graphical Representation of Mother's Occupation wise Distribution of the sample

Table 8 and figure 8 show mother's occupation. There were two categories private and government. The percentage was high in private sector with 6.8% and frequency was 3. The second category was unreported with the frequency of 41.

Table 9

Child adopted wise distribution of the sample (N=44)

| Child Adopted | <i>f</i> | <i>P</i> |
|---------------|----------|----------|
| Yes | - | - |
| No | 40 | 90.9 |

Note: - Missing value=4

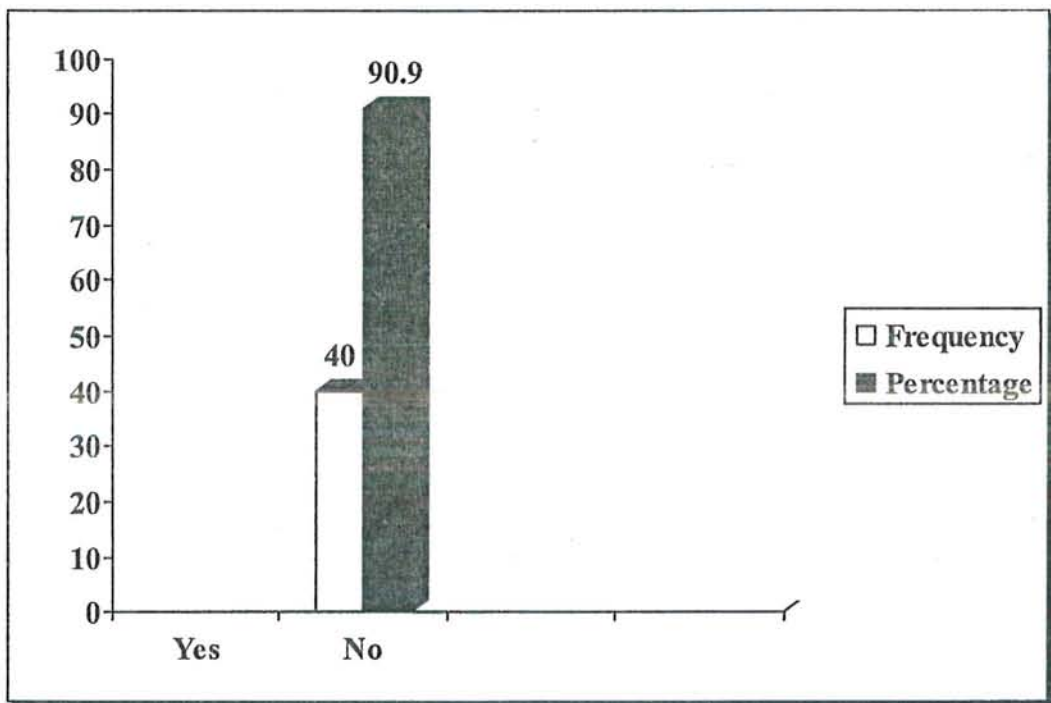


Figure 9. Graphical Representation of Child Adopted wise Distribution of the sample

Table 9 and figure 9 show that child was either adopted or not. 90.9% was reported no with frequency of 40 and 9.1% was unreported.

Table 10

Parent's divorce wise distribution of the sample (N=44)

| Parent Divorce | <i>f</i> | <i>P</i> |
|----------------|----------|----------|
| Yes | - | - |
| No | 40 | 90.9 |

Note: - Missing value=4

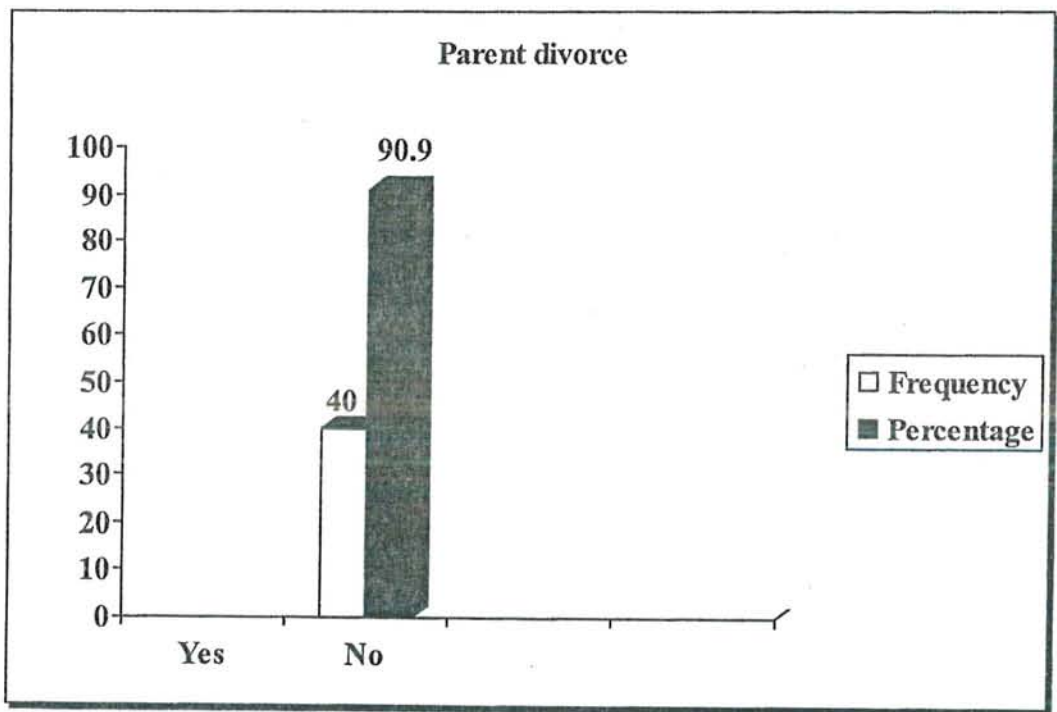


Figure 10. Graphical Representation of Parent's Divorce wise Distribution of the sample

Table 10 and figure 10 show either parent were divorced or not. 90.9% reported as no with frequency of 40 and 9.1% was unreported.

Table 11

Siblings wise distribution of the sample (N=44)

| Siblings | <i>f</i> | <i>p</i> |
|----------|----------|----------|
| 1 | 1 | 2.3 |
| 2 | 3 | 6.8 |
| 3 | 13 | 29.5 |
| 4 | 9 | 20.5 |
| 5 | 10 | 22.7 |
| 6 | 3 | 6.8 |
| 7 | 2 | 4.5 |
| 8 | 1 | 2.3 |

Note: - Missing value=2

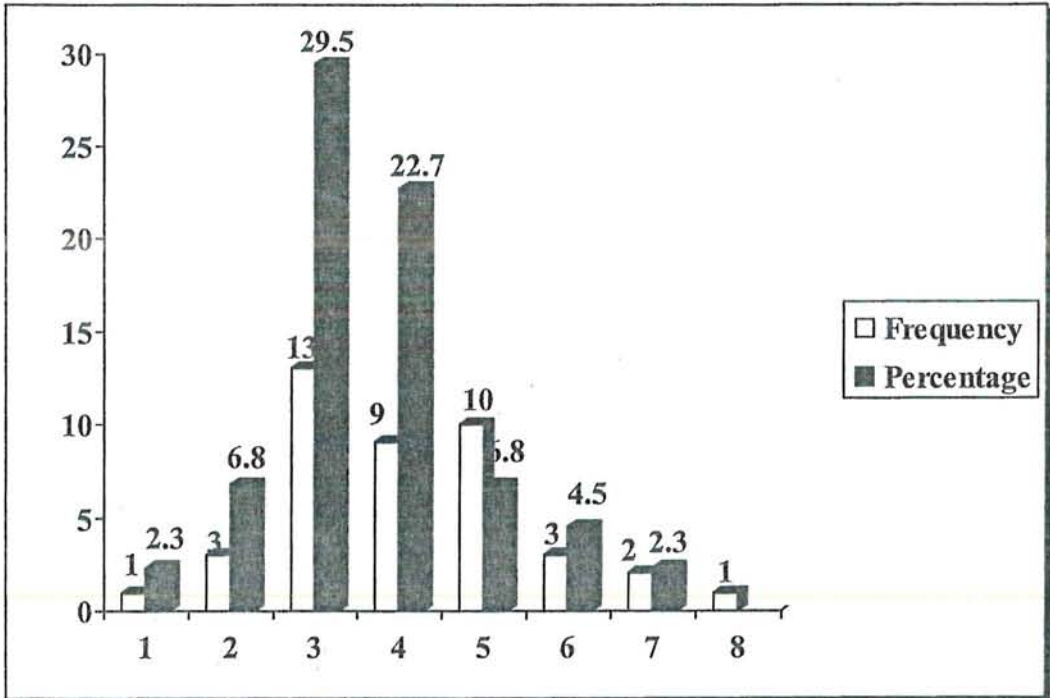


Figure 11. Graphical Representation of Siblings wise Distribution of the sample

Table 11 and figure 11 show eight different categories of siblings. It starts from 1 to 8. Those who had 3 siblings, the intensity of problem was high with 29.5% and the frequency was 13 whereas it was low at 1 and 8 siblings with 2.3% and the missing value was 2 with 4.6%.

Table 12

Siblings' birth order wise distribution of the sample (N=44)

| Siblings Birth Order | <i>f</i> | <i>P</i> |
|----------------------|----------|----------|
| 1 | 9 | 2.5 |
| 2 | 14 | 31.8 |
| 3 | 14 | 31.8 |
| 4 | 4 | 9.1 |
| 8 | 1 | 2.3 |

Note: - Missing value=2

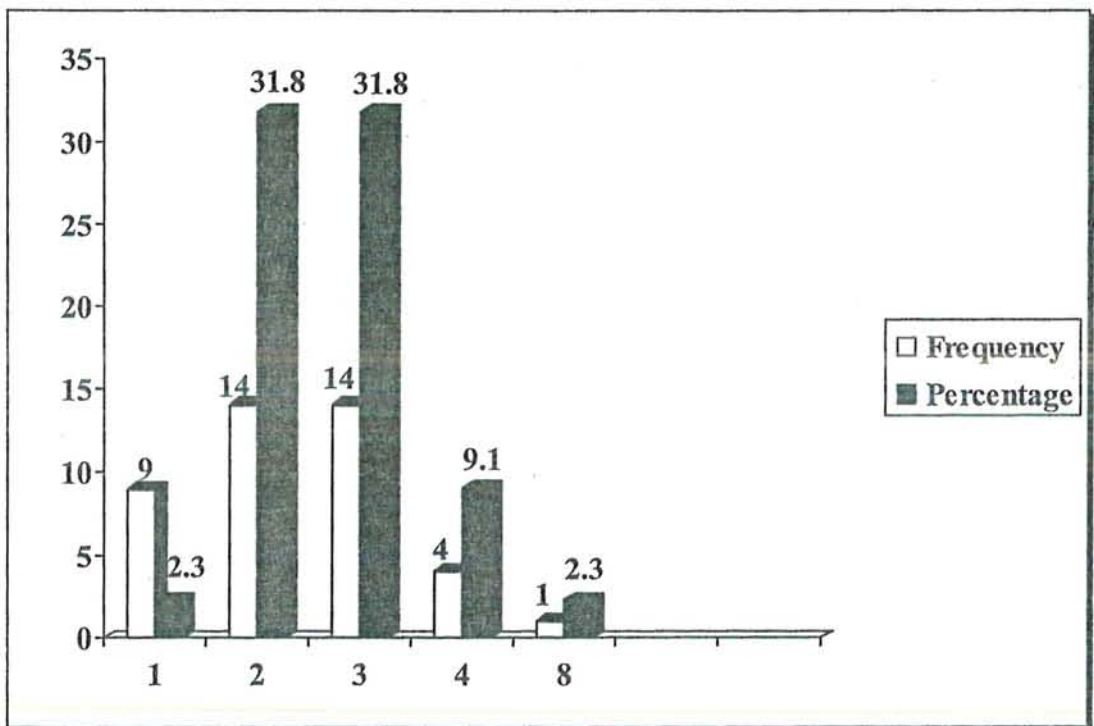


Figure 12. Graphical Representation of Siblings' Birth Order wise Distribution of the sample

Table 12 and figure 12 show 5 categories of sibling orders. The intensity was high at order 2 & 3 with 31.8% and the frequency was 14 whereas it was low at order 8 with 2.3% and the frequency was 1. The missing value was 2 with 4.5% that was unreported.

Table 13

Monthly income wise distribution of the sample (N=44)

| Monthly Income(Thousands) | <i>f</i> | <i>P</i> |
|---------------------------|----------|----------|
| 6 | 2 | 4.5 |
| 8 | 1 | 2.3 |
| 10 | 7 | 15.9 |
| 12 | 1 | 2.3 |
| 13 | 1 | 2.3 |
| 15 | 2 | 4.5 |
| 18 | 1 | 2.3 |
| 20 | 3 | 6.8 |
| 25 | 9 | 20.5 |
| 30 | 6 | 13.6 |

Note: - Missing value=11

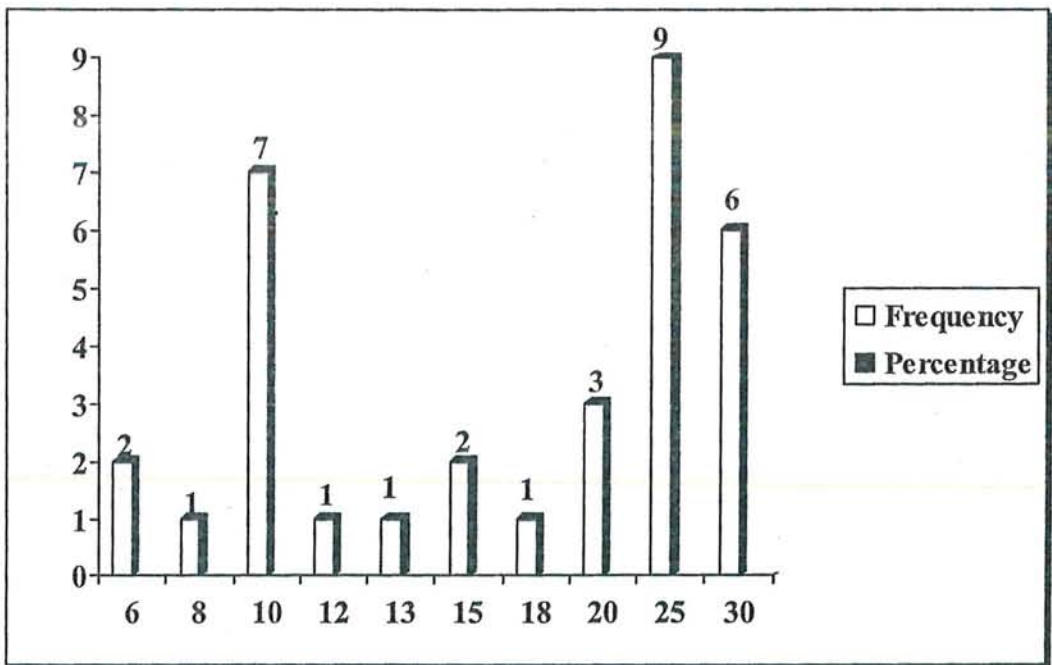


Figure 13. Graphical Representation of Monthly Income wise Distribution of the sample

Table 13 and figure 13 show monthly income of parents that describes the socio-economic status of children. It starts from minimum 6,000 to maximum 30,000. The high intensity lies at 4th level (i.e., 10,000) with 15.9% and the

frequency was 7. It was low with 2.3% those who had monthly income 12,000 to 13,000. The missing value was 11 that were unreported with 25.0%.

Table 14

Health history wise distribution of the sample (N=44)

| Health History | Boys | | | Girls | | |
|---|-------|------|---------|-------|------|---------|
| | Never | Past | Present | Never | Past | Present |
| Asthma | 35 | | | 8 | | |
| Allergies | 31 | 3 | 1 | 8 | | |
| Diabetes | 33 | 2 | | 8 | | |
| Epilepsy or Seizure Disorder | 31 | 3 | 1 | 8 | | |
| Febrile Seizures | 21 | 12 | 2 | 7 | 1 | |
| Chicken Pox or Other Common Childhood Illnesses | 21 | 11 | 3 | 6 | 2 | |
| Heart or Blood Pressure Problems | 33 | 2 | | 8 | | |
| High Fevers {Over 103 ⁰ } | 18 | 15 | 1 | 5 | 3 | |
| Broken Bones | 32 | 3 | | 7 | 1 | |
| Severe Cuts Requiring Stitches | 33 | 2 | | 8 | | |
| Head Injury with Loss of Consciousness | 32 | 3 | | 8 | | |
| Lead Poisoning | 33 | 2 | | 7 | 1 | |
| Surgery | 30 | 4 | 1 | 8 | | |
| Lengthy Hospitalization | 26 | 8 | 1 | 6 | 2 | |
| Speech or Language Problems | 31 | 2 | 2 | 8 | | |
| Hearing Difficulties | 33 | 2 | | 8 | | |
| Eye or Vision Problems | 29 | 1 | 5 | 6 | 1 | 1 |
| Fine Motor/Handwriting Problems | 24 | 5 | 6 | 7 | 1 | |
| Gross Motor Difficulties, Clumsiness | 33 | 1 | 1 | 7 | 1 | |
| Appetite Problems (Overeating or Under eating) | 16 | 6 | 13 | 5 | 1 | 2 |

Continued...

| Health History | Boys | | | Girls | | |
|---|-------|------|---------|-------|------|---------|
| | Never | Past | Present | Never | Past | Present |
| Sleep Problems (Falling Asleep, Staying Asleep) | 22 | 6 | 6 | 7 | | 1 |
| Wetting Problems | 25 | 5 | 5 | 8 | | |
| Other Health Difficulties Please Describe | 26 | 4 | 4 | 7 | | 1 |

Table 14 shows detail description of child's health history. There were different problems that were categorized accordingly. Responses of parents were showed that either child had health problem ever or not. Boys were reported high in health problems as compared to girls. Most of them were unreported.

Table 15

Pregnancy Related wise distribution of the sample (N=44)

| Pregnancy Related | Boys | | Girls | |
|---|------|----|-------|----|
| | Yes | No | Yes | No |
| Bleeding | 12 | 16 | 4 | |
| Toxemia/ Preeclampsia | 10 | 18 | 3 | 1 |
| Excessive Weight Gain (More than 30 Lbs.) | 10 | 19 | 2 | 2 |
| Frequent Nausea or Vomiting | 11 | 17 | 2 | 2 |
| Series Illness or Injury | 2 | 26 | | 4 |
| Took Prescription Medications | 10 | 19 | 2 | 2 |
| Took Illegal Drugs | 2 | 26 | | 4 |
| Smoked Cigarettes | 1 | 27 | | 4 |
| Delivery Was Induced | 7 | 20 | | 4 |
| Forceps were used During Delivery | 10 | 19 | 1 | 3 |
| Had a Breech Delivery | 7 | 22 | 1 | 3 |
| Other Problems | | 29 | | 4 |

Table15 shows description of pregnancy related problems faced by the mother during child's birth.

Table 16*Birth Related wise distribution of the sample (N=44)*

| Birth Related | Boys | | Girls | |
|--|------|----|-------|----|
| | Yes | No | Yes | No |
| Injured During Delivery | 4 | 25 | | 4 |
| Cardiopulmonary Distress During Delivery | 1 | 28 | | 4 |
| Delivered with Cord Around Neck | 5 | 24 | 1 | 3 |
| Had Trouble Breathing Following Delivery | 6 | 23 | 1 | 3 |
| Needed Oxygen | 7 | 23 | 1 | 3 |
| Was Jaundiced, Turned Yellow | 3 | 27 | | 4 |
| Had on Infection | 7 | 23 | | 4 |
| Had Seizures | 2 | 28 | 2 | 2 |
| Was Given Medication | 9 | 21 | | 4 |
| Was in Hospital More than 7 Days | 7 | 23 | | 4 |

Table 16 shows birth related problems of the children. The ratio of boys was extremely high and had a problem after birth as compared to girls and most of the girls were unreported by their mothers.

Table 17*Temperament wise distribution of the sample (N=44)*

| Temperament | Boys | | Girls | |
|--------------------------------|------|----|-------|----|
| | Yes | No | Yes | No |
| Difficult to Feed | 7 | 22 | 3 | 2 |
| Difficult to Get to Sleep | 11 | 18 | 1 | 4 |
| Colicky | 5 | 24 | 2 | 3 |
| Difficult to Put on a Schedule | 12 | 17 | 2 | 3 |
| Alert | 18 | 11 | 2 | 3 |
| Sociable | 25 | 4 | 2 | 3 |
| Easy to Comfort | 22 | 7 | 2 | 3 |
| Difficult to Keep Busy | 10 | 19 | 2 | 3 |
| Overactive, in Constant Motion | 20 | 9 | 3 | 2 |
| Very stubborn, Challenging | 10 | 19 | 1 | 4 |

Table 17 shows the temperament and mood of a child. This described that how much a child is challenging or comfortable. Boys were rated high as compared to girls in challenging.

Table 18

Basic Milestones wise distribution of the sample (N=44)

| Basic Milestones | Boys (n = 36) | | | | | | | | Girls (n = 8) | | | | | | | |
|---|------------------|---|---|---|----|----|----|----|------------------|---|---|---|----|----|----|----|
| | 6 | 7 | 8 | 9 | 10 | 12 | 18 | 24 | 6 | 7 | 8 | 9 | 10 | 12 | 18 | 24 |
| Sitting Without Help | 7 | 6 | 4 | 4 | 1 | 2 | 1 | | 1 | 1 | | 3 | | 1 | | |
| Crawling | 3 | | 6 | 7 | 5 | 4 | 1 | | | 1 | 1 | 2 | 2 | | | |
| Walking Alone, Without Assistance | | | | 1 | 1 | 1 | 14 | 4 | 1 | | | | | 5 | 1 | |
| Using Single Words (e.g., "Mama", "Dada", "Ball", etc). | | | | 5 | 3 | 10 | 4 | | | | | 2 | | 4 | | |
| Putting Two or More Words Together (e.g., "Mama Up"). | | | | 2 | | 10 | 2 | 3 | | | | | | 6 | | |
| Bladder Training, Day and Night | | | | | | 4 | 3 | 10 | | | | | | 1 | 3 | 1 |

Note: Basic Milestones measures in months

Table 18 shows the different categories of basic milestones of children. The response categories were measured in months. The total number of boys ($n = 36$) was high as compared to girls ($n = 8$) those had a problem of delaying in milestones.

DISCUSSION

DISCUSSION

The present study was conducted to find out prevalence of ADHD in city of Rawalpindi and Islamabad. The Disruptive Behavior Scale (Malik, manuscript in preparation) was used for screening of Attention deficit hyperactive children.

The study found that of the total 500 children contacted, 8.8 percent of the children were identified as attention deficit and hyperactive children. Literature review had shown that the prevalence of ADHD in children ranges from 5.5 – 6.7 percent in various studies (Barkley, 1995). Considering these figures, the researcher found that a figure of 8.8 percent is quite high. This figure is even more interesting when one considers the fact that the scale which has been used to screen out children functions on an all or none basis. That is, only those children were included in the study whom their teachers identified as endorsing all symptoms of in the school setting questionnaire.

According to Ballard and Balon (1997) ADHD is more likely to occur in boys as compared to girls. This was found to be supportive by the data. Out of the total 44 students identified to be exhibiting ADHD type behavior, 36 were boys. Nolan, Gadow, Sprafkin, and Volpe (1997) studied developmental changes and gender differences in inattention, hyperactivity, and impulsivity. They concluded that gender and age were significantly related to the prevalence of ADHD. Boys had higher rates of all types of ADHD at all ages, but gender discrepancy varied for different age groups.

Gender differences on the total ($n = 44$) for school behavior and home situation was calculated. Disruptive behavior in boys was more demanding as compared to girls. Its reason might be that in the values of Pakistani culture girls are expected to be more submissive and polite as compared to boys. And boys are considered to be more energetic, active and outgoing. They are encouraged to participate in outdoor games and interact with a variety of people more. Therefore, it can be concluded that situational factors may also play a significant role in the increase of disruptive

behavior in boys. Additionally researches have also identified that as compared to boys. Parents tend to under report the incidence of disorders in children. Even when the parents filled in questionnaire for the girl respondents, they tended to leave out a lot of information.

Many of the problems with ADHD occur within the school setting therefore it is extremely important to obtain teacher information. In another study by Beitchman, Cohen, Konstantareas, and Tannock (1996) investigated that children with ADHD are at high risk for poor cognitive functioning as measured by grade repetitions, academic underachievement, placement in special classes, need for tutoring and impaired performance on neurological measures (Barkley, 1990; Cantwell, 1985; Edelbrock & Costello, 1984; Lahey & Schaughency, 1984; Levine & Bush, 1982; Silver, 1981; Weiss & Hechtman, 1979).

Various factors are believed to be associated with ADHD. Literature identifies birth complications, genetic endowments, dietary factor, parenting, temperament, personality, socialization etc. the present study tried to explore the kind of factors that could be associated with the disorder. Specifically, Health History, Pregnancy and Birth Problems, Child Temperament, Basic Milestones were inquired about.

The study found that 23 of percent of the children were six years old, 6.8 percent were 7 years old, 27.3 percent of the children were 8 years old, 43.2 percent of the children were 9 years old, 13.6 percent of the children were 10 and 4.5 percent of the children were 11 years old. In general literature says that ADHD is manifested in he age range of 7-12 years. This seems to be reflected by our data. Corresponding to the age categorization was the class wise distribution of the same. There were four categories and problem was high in intensity in class 3 with 43.2% and it was low in class 5 with 6.8%.

Parental education was also taken into consideration. 36.4 percent of the fathers were graduate. Only 29.5% parents had lower education level than graduation. Father's occupation was also inquired. There were two categories private and government. The percentage was high in private sector with 61.4% and

frequency was 27 as compared to government sector where percentage was 29.5% and frequency was 13. There were 5 different categories to specify the education of mothers. Higher percentage of respondents were intermediate (40.9% , $f=18$) whereas it was low at primary level with 4.5%. 6.8 percent of the mothers were employed in the private sector. High percent of respondents refuse to answer this question. This shows that the sample belonged to upper middle class. He parents were educated. This means that the incidence of ADHD cannot be associated with poor lifestyles and lack proper knowledge bout parenting. This sample was from middle class family that is supposed to be the custodian of good family values.

The family structure didn't appear to play any significant role in promoting or maintaining ADHD type behavior. Majority of the sample had three or more than three siblings (one sibling $f=9$, $P=2.5$; second sibling $f=14$, $P=31.8$; third sibling $f=14$, $P=31.8$). In general research data reported that there was greater tendency in second and third born to display ADHD type behavior. Literature has generally ignored the interplay of birth order and factors predisposing, perpetuating, or precipitating ADHD type behaviors.

The present research also collected information regarding overall health and behavioral presentation of the children sampled. It was found that majority of the children showed delayed milestones. Mothers reported experience of complications after birth. These findings were predicted by literature (Rosenberg & Brodley, 1984). ADHD is associated with problems at the time of delivery, acquisition of developmental skills, reaching milestones and in adjusting to the social environment. The present research also found that frequency of problems was higher in boys as compared to girls. The prevalence and incidence of associated factors need to treat with caution. Additional analysis and data is required for conclusive discussions.

Conclusions

The present study tried to explore the kind of factors that could be associated with the disorder that apply to a prevalence of ADHD in Pakistan. Specifically, health history, pregnancy and birth problems, child temperament, basic milestones were inquired about. The present study concludes that ADHD has a tendency to prevail in large majority in schools settings. Therefore teacher and

school related variables tend to play an important role in regulating ADHD type behavior. Research indicates in ADHD is in fact related to factors like birth complications, diet, parenting, temperament, personality, socialization etc. It is also concluded that this disorder is more common in boys as compared to girls.

Limitations and Suggestions

1. The scope of the present study is very vast. It needs to incorporate data from a larger sample to yield a better picture of the prevalence of ADHD in Pakistan.
2. It was found that respondents tend to leave out information that they think is an invasion of their privacy. In the present research, information related to complications and problems during or after birth was under reported. Infact the response rate of parents was very low overall.

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