Chapter 1

Introduction

1.1 Attention Deficit Hyperactivity Disorder (ADHD)

Attention-Deficit Hyperactivity Disorder is a complex disorder with diverse challenges arising at each new phase of a child’s developmental span. The children with ADHD generally carry some symptoms with them as early as preschool age and continuing throughout adolescence and even into adulthood. The DSM-IV-TR describes the operationally the features of ADHD as a “persistent pattern of inattention and/or hyperactivity-impulsivity that is more frequent and severe than is typically observed in individuals at a comparable level of development” (APA, 2000, p85). The DSM-V has now listed ADHD under the heading of Neurodevelopmental Disorders rather than under Diagnoses Usually First Made in Infancy, Childhood, or Adolescence. American Psychiatric Association, DSM V, (2013) described ADHD as "Persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development" beginning in childhood, and present across more than one setting.

APA, 1994 defined ADHD as a behaviorally defined condition characterized by a clustering of symptoms of inattention (e.g., “difficulty following tasks,” “forgetful”) and/or hyperactivity and impulsivity (e.g., “fidgety,” “difficulty remaining seated”) with onset by seven years of age and impairment in at least two settings i.e. home and school. Wilens, Biederman & Spencer, 2002 stated there are three subtypes of ADHD are recognized: primarily inattentive (50–75%), primarily hyperactive/impulsive (20–30%), and a combined subtype (less than 15%).

International Statistical Classification of Diseases and Related Health Problems (ICD-10) refer ADHD as “Hyperkinetic disorders” however when a conduct disorder is present, then condition is referred to as hyperkinetic conduct disorder, (WHO, 2010). The Diagnostic and Statistical Manual-IV TR (2000) divides ADHD into three subtypes: predominantly inattentive, predominantly hyperactive-impulsive, and combined (inattentive and hyperactive-impulsive). Attention disorders are characterized by limited attention and difficulty in concentrating”. Students are unable to concentrate on a task and have difficulty screening out irrelevant stimuli. Impulsivity represents a
youth’s difficulty in withholding active responses such as blurting out statements or grabbing materials. Hyperactive youth “display rates of motor behavior that are too high for their age groups; they indulge in excessive and non-purposeful movement”.

1.2 Defining Attention Deficit Disorder (ADD)

ADD without hyperactivity has been defined with its most central feature of inattentiveness. Other associated behaviors observed are excessive daydreaming, “spacy” appearance, cognitive sluggishness, hypoactivity, lethargy, excessive confusion or mental “fogginess,” and apparent problems of memory retrieval. Inattention manifests itself as an inability to sustain attention in tasks, to follow instructions and rules for the same duration as their peers Barkley, (1997a); Biederman, (2005). These individuals tend to reflect substantial degrees of anxiety, be socially inept, shy, or have diminished social involvement. They are rarely aggressive, oppositional, or impulsive. The children with ADD tend to doubt their confidence despite the fact that they are capable of being doing that task. And its repercussion leads to a high degree of avoidance and procrastination. ADD children and adolescents not only get easily distracted with the external environment but by the stream of thoughts in their mind. ADD without hyperactivity is called as slow cognitive speed or slow thinking speed — as if the information is slowly moving through the brain like sludge.

Children with inattention symptomatic of ADHD are usually described as disorganized, distracted and forgetful when compared to other children of the same age. Parents and teachers often report the child’s inability to follow instructions, distractible and daydreamer, and switch from one activity to another without completing the previous one. Research using measures of attention corroborate these reports, (Barkley, 1997a).

1.3 Hyperactive-Impulsive behavior

ADHD involves the key feature of impulsivity and over activity. Children and adolescent diagnosed with ADHD manifest hyperactive behavior, motor excessiveness, social inappropriateness, interruptive behaviors, aggressiveness, oppositional behavior, failure to conform to rules, lack of an internal value system, and the need for external motivation and structure. Research shows that the ADHD children doesn’t use private speech or an internal language to talk themselves through tasks due to which they had difficulty in expressing appropriate reaction. It has been observed and found by
researchers that ADHD children has constant need for stimulation and the novel situation as their motivational center is also impacted. Mastropieri & Scruggs, (2007) described the characteristics of students with ADHD as follow: “frequently ignores directions, talks continuously, impatient, gives up easily, often interrupts, touches everything, rarely finishes work, frequently fidgeting”.

Parents and teachers describe hyperactive children and adolescents acting as if driven by a motor, always on the go, fidgety and difficulty in waiting and too quick at responding when expected to wait and watch for events to occur, on CPT often seen impulsive errors has been found by Losier, McGrath, & Klein, (1996); Newcorn et al., (2001), interrupting behavior while others are conversing Malone & Swanson, (1993), difficulty in delaying gratification, Anderson, Hinshaw, & Simmel, (1994); Barkley, Edwards, Laneiri, & Metevia,(2001); Olson et al., (1999); Rapport, Tucker, DuPaul, Merlo, & Stoner, (1986); Solanto et al., (2001). In research findings it has been documented that ADHD children are found to be relatively more active than other children Barkley & Cunningham, (1979a); Dane, Schachar, & Tannock, (2000); Luk, (1985); Porrino et al., (1983); Shelton et al., (1998), it is difficult for them to control an ongoing behavior Schachar, Tannock, & Logan,(1993); Milich, Hartung, & Haigler, (1994); Nigg,( 1999, 2001); Oosterlaan, Logan, & Sergeant,(1998), over talkative than others Barkley, Cunningham, & Karlsson, (1983).

Hyperactivity in children with ADHD manifests symptoms of an increased tendency to move around, run, climb, etc. than children of the same age without ADHD Barkley,(1997a); Biederman, (2005). In many research findings it has been suggested that the parents and teachers dealing with ADHD children found them more active than their peers. The symptom of hyperactivity and disinhibited behavior becomes more apparent in early childhood i.e. 3-4 years of age as compared to the feature of inattention, which usually arise around 5-7 years of age or later. Barkley,(1997a) reported that these symptoms subsidies in reverse pattern, hyperactivity declines as the child gets older while inattention persists at least up and until adolescence.

1.4 ADHD - DSM IV vs DSM V

In May (2013), the American Psychiatric Association replaced the DSM-IV TR with the revised fifth edition DSM-V. The changes made in DSM V are as follow:
Examples have been included to the criteria to assist application across the life span.

The onset criterion has been replaced to age 12 years instead of 7 years.

Subtypes have been modified with presentation specifiers.

A co-morbid diagnosis with autism spectrum disorder (ASD) is now permitted.

To meet the ADHD criteria five symptoms for adults whereas it is six for younger people in either of the two significant domains: inattention and hyperactivity/impulsivity.

1.5 DSM V Criteria for ADHD (APA, 2013)

People with ADHD show a persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development:

1. **Inattention:** Six or more symptoms of inattention for children up to age 16, or five or more for adolescents 17 and older and adults; symptoms of inattention have been present for at least 6 months, and they are inappropriate for developmental level:

- Often fails to give close attention to details or makes careless mistakes in schoolwork, at work, or with other activities.
- Often has trouble holding attention on tasks or play activities.
- Often does not seem to listen when spoken to directly.
- Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (e.g., loses focus, side-tracked).
- Often have trouble organizing tasks and activities.
- Often avoids, dislikes, or is reluctant to do tasks that require mental effort over a long period of time (such as schoolwork or homework).
- Often loses things necessary for tasks and activities (e.g. school materials, pencils, books, tools, wallets, keys, paperwork, eyeglasses, mobile telephones).
- Is often easily distracted.
- Is often forgetful in daily activities.

2. **Hyperactivity and Impulsivity:** Six or more symptoms of hyperactivity-impulsivity for children up to age 16, or five or more for adolescents 17 and older
and adults; symptoms of hyperactivity-impulsivity have been present for at least 6 months to an extent that is disruptive and inappropriate for the person’s developmental level:

- Often fidgets with or taps hands or feet, or squirms in seat.
- Often leaves seat in situations when remaining seated is expected.
- Often runs about or climbs in situations where it is not appropriate (adolescents or adults may be limited to feeling restless).
- Often unable to play or take part in leisure activities quietly.
- Is often "on the go" acting as if "driven by a motor".
- Often talks excessively.
- Often blurts out an answer before a question has been completed.
- Often has trouble waiting his/her turn.
- Often interrupts or intrudes on others (e.g., butts into conversations or games)

In addition, the following conditions must be met:

- Several inattentive or hyperactive-impulsive symptoms were present before age 12 years.
- Several symptoms are present in two or more setting, (e.g., at home, school or work; with friends or relatives; in other activities).
- There is clear evidence that the symptoms interfere with, or reduce the quality of, social, school, or work functioning.
- The symptoms do not happen only during the course of schizophrenia or another psychotic disorder. The symptoms are not better explained by another mental disorder (e.g. Mood Disorder, Anxiety Disorder, Dissociative Disorder, or a Personality Disorder).

**Based on the types of symptoms, three kinds (presentations) of ADHD can occur:**

Combined Presentation: when enough symptoms of both criteria inattention and hyperactivity-impulsivity were present for the past 6 months

Predominantly Inattentive Presentation: when enough symptoms of inattention, but not hyperactivity-impulsivity, were present for the past six months
Predominantly Hyperactive-Impulsive Presentation: when enough symptoms of hyperactivity-impulsivity but not inattention were present for the past six months.

Because symptoms can change over time, the presentation may change over time as well.

1.6 Developmental challenges faced by ADHD Adolescents

The developmental period of adolescent in context of emotional and social development has been addressed in several theories. The purpose to understand adolescent age here is to acknowledge the challenges faced by ADHD adolescents. Erikson (1968) has described adolescence period as a psychological gap between the security of childhood and the autonomy of adulthood. He further added that teachers and other adults play crucial role in the development of adolescents' identities. As teachers can identify and appreciate the adolescent for the tasks done does well or for appropriate behavior however with ADHD adolescents such kind of appreciation and acknowledgement is often missing because they often lack the desired behavior and skills in a classroom. Thus this can create emotional, behavioral and social problems and it also generate the feeling that peers are experiencing autonomy through working independently whereas ADHD adolescent still requires assistance in academic tasks and this can be awkward for them because it makes them stand out of group Hamman, & Hendricks, (2008).

Strom (1980) gave the human developmental theory to understand and to examine developmental challenges and goals of adolescent age. He described three basic human goals: rootedness, proactive, and identity. "Rootedness" has been consider as as a sense of belonging, family or community The second goal, "proactive", described as the autonomy to choose and control one's life. The last third goal, "identity", means having a sense of self concept as a person. Elbaum (2002), described self-concept as the combination of beliefs and feelings about oneself at a given time. The ADHD adolescents may find difficulty in achieving these goals as described by human developmental theory. It suggests that developmental challenges faced by youth with ADHD may be greater than their peers.
1.7 Impact of ADHD – on Cognitive, Behavioral, Affective & Social domain of Adolescent

Currently, ADHD has been considered as a chronic disorder, which generally continues beyond childhood, into adolescence and adulthood Willoughby, (2003). It has been revealed from studies that the children & adolescents diagnosed with ADHD have special academic, social and emotional needs and all this makes the life of ADHD more challengeable. Le Fever, Villers, & Morrow, (2002); O’Callaghan et al., (2003) put forth that adolescents with ADHD have more challenges in an academic setting as compared to their peers. Sherman et al., (2008) reported that if there is any movement, noise or sound in the classroom then it becomes more challenging for student with ADHD to pay attention to what a teacher is teaching or instructing.

As ADHD children grows and reaches to adolescent age the expectation increases to complete the assignment and they often come to class with incomplete assignments, unprepared, lack of appropriate materials, and fail to turn homework on time. Their rooms and cupboards are often disorganized, and have difficulty in prioritizing of tasks and managing time. ADHD teens often Robin,(1998), reported that in fact “the greatest academic difficulty for the average ADHD student is completing all of his or her homework and turning it in on time”.

As already cited that youth with ADHD are more likely to experience social exclusion and isolation and often their friendship is characterized by tension and frequent conflict and quarrels Brook & Boaz, (2005). The sufficient empirical researches have revealed that the social interactions of ADHD adolescents are often frustrating and increase the symptoms of depression and anxiety, potentially propel them toward substance abuse and delinquency Semrud-Clikeman, & Schafer, (2000); Thompson, Riggs, Mikulich, & Crowley, (1996). Adolescents with ADHD are often thought of as different and even despite being part of the classroom, are often not included by their peers. Peer group of ADHD consider them as different or weird due to lack of knowledge and understanding and ADHD adolescents despite being part of the classroom, are not including by their peers thus creating the feeling of being indifferent and fuelled the behavioral, emotional and social problem.

The behavioral, social, emotional problems associated with ADHD adolescents could be because of deficit in self regulation. Matthys, Cuperus, & van Engeland, (1999)
reported that people diagnosed with ADHD have been shown to encode fewer social cues thus resulting in co-morbid relationship problems and embarrassing social interactions. Children with ADHD found to have difficulty and maintain the friendship because of many reasons:

Children and adolescents with ADHD have deficit in encoding the social cues during conversation, difficulty waiting for turn and problem solving.

- Children and adolescents with ADHD demonstrate difficulty in self regulation of behavior and emotions and may react inappropriately.
- ADHD children and adolescents may have trouble cooperating with friends.
- All such "problem" behaviors associated with ADHD are not intentional however they are integral part of the disorder.

Robin (1998) reported from research work that teenagers diagnosed with ADHD endure numerous negative outcomes linked to their ADHD symptoms such as academic failure, social isolation, depression, lower self-esteem, and lower quality of life.

Adolescents with ADHD are more at risk to indulge in deviant peer group and are more vulnerable to negative social influences of that group which further lead to illegal usage of substances Marshal, Molina, & Pelham,(2003). Furthermore Thompson, Molino, Pelham & Gnangy, (2007), added that the adolescents with ADHD are also more likely to engage in reckless driving, risky sexual behavior Flory et al.(2006) and criminal activities Fletcher & Wolfe, (2009).

1.8 ADHD & Aggression

Aggression is a form of behavior in which one expresses his/ her feelings/ emotions in negative ways which harm, hurt or injure self or others. Aggressive behavior reflects the negative connotation in behavior and is considered as unhealthy or unhelpful behavior pattern which when associated with the ADHD features can make it more difficult for adolescents and people around them. Hinshaw, (1994). Reported that ADHD-C are more likely to have associated behaviour problems marked by oppositionality, defiance, and aggression as compared to those with ADHD–I. In addition to this Little et al. (2003); Ostrov and Crick (2007); Prinstein and Cillessen (2003) has put aggressive behaviours on two specific dimensions i.e. "form" and "function". The first dimension of aggressive behaviour is “form”, which is either
expressed physically (i.e., use or threat of physical force) or relationally (i.e., via
damage or threat of damage to relationships). The second dimension of the aggressive
behaviour serves its “function” which is again either reactive or proactive the reactive
behaviour includes impulsiveness, anger oriented and response to a threat whereas
proactive behaviour involves goal oriented and often calculating in nature. Card et al.
(2008) explained aggressive behaviour with recent meta-analytic research suggests that
overt aggression is more highly associated with externalizing problems such as ADHD
or delinquency, relational aggression is more associated with internalizing problems
such as depression or anxiety. As reported by Harty et al. (2009), that the symptoms of
ADHD are associated with impulsivity, anger and which are further subsequently
linked to childhood aggression, (Deming and Lochman, 2008).

1.9 ADHD & Conduct problems

Conduct problems can be understood as the behavior patterns which are inconsistent
with the expected behavior of that particular developmental period. Blissett, (2009)
stated that childhood conduct problems include a wide range of antisocial, aggressive,
delinquent, defiant and disruptive behaviors. These behaviors may vary from none to
severe, and may have the following consequences for the young person and those
around them: distress and concern to adult care givers and authority figures; threats to
the physical safety people involved and their peers; disruption of home, school or other
environments ; and involvement of the criminal justice system.

It has been concluded from review evidence from New Zealand longitudinal studies
that early symptoms of conduct problems have positive prognosis with a wide range of
negative outcomes which includes crime, imprisonment, mental health problems,
suicidal behaviors and physical health problems. There are many deviant behaviors co-
occurring with conduct problems in adolescence such as early sexual behavior, teenage
pregnancy, early onset alcohol and substance abuse, serious school problems including
suspension, truancy and school drop-out, and other emotional problems which involves
depression, anxiety and suicidal behaviors, (Fergusson et al., 2004; Moffit et al., 2001;
Vermeiren et al., 2006).

1.10 ADHD & Emotional problems

Emotional problems involve the symptoms of anxiety and depression, such as sadness,
loneliness, worrying, feelings of worthlessness and anxiousness. If individual suffers
from emotional problems it reduces the levels of functioning in relation to family and friends, school achievements and subjective wellbeing and from psychological perspective, this causes major personal costs to one’s individuality. Researches by Barkley (2010); Braaten & Rosen, (2000); Maedgen & Carlson, (2000) clearly indicates that those with ADHD have significant problems with emotion regulation. ADHD children tend to be easily frustrated, emotionally explosive, and less attentive to social cues as documented by Henker & Whalen, (1999); Landau, Milich, & Diener, (1998). The recent study supported the previous research and was conducted by Barkley, (2006), Anastopoulos et al. (2011) revealed that ADHD children have poor emotional self-regulation, aggression, and reduced empathy and is manifested as emotional difficulties Consequently, ADHD children sometimes appears to be less emotionally mature, more reactive with their feelings, and more hot-headed, quick-tempered.

Roberto Olivardia, clinical psychologist at Harvard Medical School said “They have problems inhibiting inappropriate behavior related to strong positive or negative emotion.” Further research supported by Cadesky et al. (2000); Maedgen and Carlson, (2000); Walcott and Landau, (2004) that ADHD has been found to be associate with emotional reactivity, with reduced emotional inhibition, recognition, and empathy. Barkley, (2010) documented in his research work with ADHD that deficient emotion regulation is due to failure in inhibition of negative emotions that leads to negative affectively-driven impulsive behavior in ADHD.

As already documented in the above cited research, adolescents with ADHD are unable to modulate their emotions and control their behavior as per the demand placed by parents, teachers or with peers within social contexts Barkley, (1990) and often try to manage situation with avoidance and aggression Hampel, Manhal, Roos, & Desman, (2008). Consequently, ADHD adolescents began to believe that academic, social, and familial problems are beyond their control Erk, (2000), which in results fueled emotional and behavioral difficulties.

1.11 ADHD & Self Esteem

Rosenberg (1965) described self-esteem as a person’s positive or negative attitude toward oneself. Self-esteem is viewed as a sense of self-worth and considering the value of oneself as a person Elbaum (2002). The research carried out by Brook & Boaz,
revealed that the one third of adolescents with ADHD consider themselves to be
out of place or indifferent from others.

Adolescents diagnosed with ADHD are often emotionally less mature relatively to the
peer group Hoy et al. (1978). The teachers often feels pessimistic about teaching youth
with ADHD as these students manifest disruptiveness in behavior as reported by Kos,
Richdale, & Hay,( 2006) and moreover also explained that ADHD adolescents that they
often behave best when interacting with younger children or with adults who tolerate
their immature behaviours. It has been found in researches done by Barkley,
Anastopoulos, Guevremont, Fletcher, (1992) that adolescents and children with
ADHD often display emotional reaction both negative and positive, that in excess for
the situation.

Research findings reported by Lee, Lahey, Owens, Hinshaw, (2008) that most
adolescents with ADHD reported higher level of emotional, social and scholastic
impairment as compared to non-ADHD peers. The findings from longitudinal studies
also demonstrated that children diagnosed with ADHD reported lower self-esteem in
adolescence age as compared to controls. Edbom, Lichtenstein, Granlund (2006),

1.12 ADHD & Memory

Working memory is a system that permits individual to hold information in mind long
enough to use the information for some purpose Baddley, (2000). Working memory has
an important function for cognitive tasks, such as remembering instructions,
completing tasks, and is more applied in academic learning and reasoning, (Nigg,
2006). A recent meta-analysis done by Martinussen et al., (2005) has revealed that
verbal and visual spatial working memory has been found to be relatively impaired in
reported that ADHD individuals are more distractible, less attentive which in turns
creates difficulty in holding and retrieving the information. Barkley, (1996) stated that
the impairments in the executive functioning of working memory has been appeared to
be associated with ADHD symptoms furthermore children and adolescents with ADHD
have difficulties with complex reasoning, forgetfulness, organization, planning, and
goal setting (Rickel & Brown, 2007).
1.13 ADHD & Learning Problems

Learning difficulties are the problems associated with understanding, learning, comprehension, reading and writing. Difficulties with inhibitory control have been observed in students with ADHD and language based LD (Barkley, 2006); Berlin, Bohlin, Nyberg & Janals, (2004); Denckla, (2007); Pasini et. al., (2007). In addition to this, adolescents with LD and ADHD are more likely to experience mental health difficulties, including anxiety, depression and substance abuse (Beitchman et. al., (2001); Elia, Ambrosini & Berrettini, (2008); Jarrett & Ollendick, (2008); Treuting & Hinshaw, (2001).

1.14 ADHD & Peer Relations

Peer relationships are of key context in which children and adolescents learn cooperation, negotiation, and conflict resolution Rubin et al. 1998 stated that these skills are critical for effective social functioning throughout the life span. Children and adolescents with ADHD have difficulty in acquiring social skills through observational learning as reported by Cunningham et al (1985) and deficit in attending social cues necessary for effective social interactions, Landau, Milich (1988), hyperactive and impulsive behaviors aggravate peer relation because of unrestrained social behavior of ADHD children Whalen, Henker (1992). It has been documented by Mikami, Lerner, & Lun, (2010) that a teacher can assist in dismantling negative image held by the peer group by portraying attention towards strengths of ADHD children.

1.15 ADHD & Executive Function

Executive function as the set of cognitive processes that control and manage goal-directed behaviour and these cognitive processes involve setting of goal, organization of behaviour, response inhibition, cognitive flexibility, working memory, attention, emotional control and progress monitoring (Denckla, 2007); Fernandez- b Duque et al. (2000). In other words executive function can be considered as brain functions that activate, organize, integrate and regulate other activity. Brown, (2000) a leading ADHD researcher at Yale University, refers to executive functions as the “cognitive management system of the brain.” The executive function enables one to consider for short and long term repercussion of actions, assessment of their actions and to plan further and make necessary adjustments.
Brown (2000) compared the executive function to the conductor of an orchestra. The conductor organizes, activates focuses, integrates, and directs the musicians to play and enable the orchestra to produce complex music. In the same way the brain's executive functions organize, activate, focus, integrate and direct, allowing the brain to perform both routine and creative work. Furthermore added by Diamond (2002) that executive functions considered as the cognitive skills and processes grouped in the frontal lobe and it includes regulation of time and responses, storing details and sustaining & shifting focus.

It has been documented by Mercugliano, Power, & Blum, (1999); Nigg & Casey, 2005 that ADHD individuals have difficulty with arousal, motivation, planning, pursuing goal-directed behaviors, and adapting the behavior in response to the changing demands of different situations.

The two major ADHD researchers involved in studying executive function are Barkley and Brown. According to Brown (2000), executive function can break down different clusters and all these clusters operate in an integrated way, and individual suffering with ADHD tend to have impairments in one these cluster.

The following are six “clusters” of executive functions presented by Brown (2000):

1. Organizing, prioritizing and activating for tasks
2. Focusing, sustaining and shifting attention to task
3. Regulating alertness, sustaining effort and processing speed
4. Managing frustration and modulating emotions
5. Utilizing working memory and accessing recall
6. Monitoring and self-regulating action

Brown (2005) described that deficit at any of these clusters can cause to inattention, working memory, difficulty organizing tasks, initiating task, remained involved in the task, recall, trouble composing emotional state, self-monitoring, regulating actions.

Barkley (2006) breaks executive functions into four areas such as nonverbal working memory, verbal working memory (internalization of Speech) Self-regulation and Reconstitution.
Barkley's model has well developed explanatory notion that challenges faced by ADHD individuals lie at the root of inability to self-regulate. Further Barkley (2008) emphasized that ADHD individuals have difficulty in delaying responses and thus acting impulsively without evaluating future outcome that can be beneficial or negative. Barkley (2001 & 2005), added that executive function as a means of behavioural self-regulation, enables to modulate behaviour in a way that is desirable and adaptive to the contexts of the situation. It has been reported by Bramham et al. (2009b); Marzocchi et al. (2009) that the planning difficulties have also been found in children with ADHD. Wilcutt et al. (2005) from the meta-analysis of the executive function available in literature of ADHD revealed that response inhibition, vigilance, working memory, and planning are the strongest and most consistent deficits found across studies.

1.16 Epidemiology

It affects about 6–7% of children when diagnosed via the DSM IV criteria Willcutt (2012) and 1–2% when diagnosed via the ICD-10 criteria (Cowen et al. 2012). The prevalence in school age children is thought to be about 1.5%, compared with an estimated 5.3% for ADHD Banaschewski et al. (2009). Prevalence rates of ADHD vary from 2 to 16% however major estimates falls between 5 and 10% of children and adolescents and 4% of adults Kessler et al., (2006); Skounti, Philalithis, & Galanakis, (2007). It has been reported by Biederman et al., (2004); Clark, Feehan, Tinline, & Vostanis, (1999); Loo et al., (2007) that ADHD has often co-morbid disorders of learning disability including (dyslexia, executive function deficits), and social–emotional development (including elevated rates of autism spectrum disorders). Furthermore, it has been found by scientists Biederman, (2004); Kessler et al., 2006 that ADHD too has increased rate of co morbidity with psychiatric disorders, such as anxiety, depression, oppositional defiant disorder, and substance abuse.

The statistical data reveals that ADHD has risen on an average with three percent per year from (1997 to 2006) however it has been reported to be increased by five percent from (2003 to 2011).

Research data indicates that parents of children with a history of ADHD report almost 3 times as many peer problems as those without a history of ADHD (21.1% vs. 7.3%)
and it has documented that children with the history of ADHD are almost 10 times likely to have difficulties in friendships as reported by parents (20.6% vs. 2.0%).

According to scientific data available it can be summarize that there are many reasons for the increase in the diagnosis of ADHD over the past few decades. It might be because of more depth understanding of the disorder and awareness which has led professionals and educators to identify the symptoms. On the other hand, the living style has changed which majorly includes a sedentary lifestyle, video games an unhealthy diet pattern and decrease in physical education in school. Some other group of people also believe many medical professionals over diagnose the condition of ADHD and it could be just normal behavior and is categorized and diagnosed as ADHD.

1.17 Common conditions that coexist with ADHD include:

- **Learning disabilities.** In about 20% to 30% cases of children with ADHD, the specific learning disability has been found and reported by Bailey& Eileen, (2013) and it makes it more difficult and challenging for children with ADHD.

- **Tourette syndrome.** The syndrome is a neurological condition that causes various nervous tics and repetitive behavior and it may co-exist with ADHD NIMH, (2013)

- **Oppositional defiant disorder and Conduct disorder** usually occurs with ADHD in about 50% and 20% of cases respectively as reported by McBurnett Pfiffner (2009). The behavior of the children with ODD and CD are usually characterized by stubbornness, aggression, lying, and stealing behavior Krull (2007). In addition to this Hofvander, Ossowski, Lundström, Anckarsäter (2009) found that about half of the children with hyperactivity and ODD or CD may develop antisocial personality disorder in adulthood. Furthermore Rubia (2011) found that the brain images reveal separate conditions for conduct disorder and ADHD.

- **Anxiety and Depression.** In many cases, it has been found that children with ADHD may have symptoms of anxiety or depression as documented by Wilens, Spencer (2010)

- **Bipolar disorder.** Bipolar disorder is characterized by mood swings between periods of intense emotional highs and lows. It has been reported by many
studies that the clinical features are more associated with ADHD. The bipolar child may have elated moods and feeling of grandiosity with alternating periods of depression or chronic irritability. If ADHD doesn’t get diagnosed and treated on time then the prognosis is more that it may develop into mania in adulthood. Wilens, Spencer (2010) reported from the study that the boys diagnosed with the combined subtype of ADHD are at more risk to have a mood disorder.

- **Substance use Disorders**: As reported by Kooij et al.(2010) that adolescents and adults with ADHD are at increased risk of developing a substance use disorder.

### 1.18 Etiology of ADHD

When talking about ADHD etiological factors then it has been found by researchers in this field that this disorder has heterogeneous presentation and etiology which involve genetic, neurobehavioral, psychosocial and environmental. All these influences have been identified as influential in the development and variability of ADHD.

To understand the brain structure of ADHD children, it is said to imagine the brain as a large corporation, with many offices and departments, each with a specific job to do. In any corporation, the executive suite monitors the activity of the rest of the departments, prioritizes, disregards unimportant activities and plans for the future. However the ADHD children have difficulty in carrying out all the tasks as reported by different studies it could be because of lack of synchronization in different parts of brain.

Research indicates that the ADHD has been described as behavioural disorder and found to be associated with neurological deficits which includes structural/functional region of brain e.g., prefrontal cortex, amygdala, cerebellum, basal ganglia. Bush, Valera, & Seidman, (2005) and resulting in impairment in executive functioning which involves working memory, attention regulation and inhibition Seidman, (2006); Desman, Petermann, & Hampel, (2008); Ma et al., (2012); Wåhlstedt, Thorell, & Bohlin, (2008). Furthermore neuroimaging research supported by Cardinal, Winstanley, Robbins, & Everitt, (2004); Plessen et al., (2006) that brain regions associated with affect regulation (amygdala, ventralmedial prefrontal cortex) differ in structure and function in ADHD children. Studies in brain areas have widely noted that the difficulties in arousal, motivation, and emotional regulation in ADHD (Nigg & Casey 2005).
Faraone et al., (2005) documented that ADHD is highly heritable disorder - family, twin, and adoption studies suggest that ADHD and its component behaviors of inattention, hyperactivity, and impulsivity with estimates of 76% heritability.

Numerous studies conducted in the field of ADHD have demonstrated that the brain regions involved in the inhibitory functioning are found to be underactive in ADHD participants, which causes struggle during tasks and adds on to the core features of ADHD - inattention or impulsiveness Mulligan et al., (2011); Smith et al., (2006); Tamm, Menon, Ringel, & Reiss, (2004).

A 10-year study by National Institute of Mental Health found that brains of children and adolescents with ADHD are 3 to 4% smaller than those without ADHD and that medication treatment is not the cause.

Genes involved in brain neurotransmission (e.g., dopamine, serotonin, norepinephrine, (Faraone, Biederman, & Mick, (2006); Lu et al., (2008) are implicated. People with ADHD seem to have lower levels of dopamine in the brain. It has been found in one dopamine study that particularly variation of the DRD4 gene is associated with dopamine receptor in the brain. The study explains that the stimulant medication for ADHD such as Ritalin and Adderall are beneficial in the treatment of ADHD. As these stimulant medications increase the level of dopamine by strengthening the weak dopamine signals in the brain which in turn counters the decreased brain dopamine activity in ADHD.

It has been demonstrated by Zametkin, et al.(1993) through PET scans that ADHD individuals have less activity in the prefrontal and frontal lobes as compared to normal individuals and this region of brain is particularly the most complex and largest area of the brain and involved in executive functions, effective self control, self monitoring, verbal regulation, motor control, maintaining and changing mental set and emotional regulation and thus less regulation of the brains executive function means more impulsive, disorganized and disruptive behavior. In an empirically study Barkley, (2006) stated that children and adolescents with ADHD demonstrated that deficiencies in other abilities which generally falls within the domain of executive functioning. In line with above cited study, Brown, (2008) reveals that impairment in executive functioning includes problems with organization, procrastination, concentration, processing speed, regulating and managing emotions, and working memory.
According to a model of ADHD developed by Dr. Russell Barkley, a problem in response inhibition is the core deficit in ADHD. The model suggests that the primary deficit in ADHD is the specific executive function of behavioral inhibition. Furthermore research conducted by Friedman et al., (2003); Nigg, (2001) also documented that the inability to inhibit responses is widely coupled with an increased emotional reactivity, trouble dealing with frustration/anger, and increased difficulty self-regulating one’s emotions. Research review from meta-analysis of 83 studies investigated the executive functioning in samples with ADHD, Willcutt, Doyle, Nigg, Faraone, and Pennington (2005) and concluded that executive functioning is considered as one of the major cause of the impairments associated with ADHD.

The environmental risk factors may affect adversely affect brain development such as low birth weight, maternal smoking during pregnancy, lead exposure, and socioeconomic status are important, a biological predisposition is perhaps most salient Nigg,(2003); Zuddas, Ancillette, Muglia, & Cianchetti, (2000), .and fetal hypoxia, brain injury, exposure to toxins such as lead and deficiency of zinc, Toren et al., (1996) Brookes et al., (2006) reported that the risk factors do not act in isolation, but when interacted with another factors then increases the probability for developing disorder. For example, the vulnerability of ADHD will increase if in case maternal alcohol consumption during pregnancy was also present and get associated with a dopamine transporter (DAT) susceptibility gene.

### 1.19 Approaches for treating ADHD

The variety of treatment approaches have been implemented with ADHD individuals which includes: psychotropic medications -stimulants and non-stimulants, psychosocial treatments includes behavioural therapy, cognitive behavioural therapy, family therapy, social skills training, individual psychotherapy, and alternative approaches includes neurofeedback, dietary changes, supplements, and mind-body interventions as reported by Arnold, (2001). Further Jensen et al.,(2007) reported that the standard treatment for ADHD, involves medications, behavioural therapy or both. However Dodson, (2005) reported that the stimulant medications are considered “best practice” in the treatment of ADHD across the lifespan. However, Whalen & Henker, (1998) said that the pills do not teach skills required to cope up with symptoms of ADHD. In support to previous study Shekim, Asarnow, Hess, Zaucha, & Wheeler, 1990; Wender, (1998) revealed that
in many cases 20–30% of children and adolescents and perhaps 50% of adults are considered non-responders because of insufficient reduction or improvement in symptoms or intolerable side effects. The medication treatment has been disliked by parents or adults and more preference has been noted for psychological therapies or alternative form of treatment. Arnold, (2001) proposed that meditation has been considered as potential treatment for ADHD and different studies have validated that one of the alternative approach for treating ADHD is mindfulness. Further supported by Zylowska et al., (2007) reported that some people are not responsive of pharmalogical treatment, experience intolerable side effects and refuses to use it for health concerns. Recent reviews of literature suggest mindfulness as positive and significant approach for the ADHD.

1.20 Concept and Definition of Mindfulness

The mindfulness has its roots in Buddhist philosophy and for more than 2000 years it has been practiced. The core and overt mission of mindfulness therapy is to lighten individuals having dysfunctional ways to react to situation and to facilitate the new alternative functional ways of responding. The Professor Kabat-Zinn, has brought mindfulness therapy into mainstream medicine founder and numerous researches has established the basis for improvements in physical and psychological symptoms and well being of individuals.

Mindfulness can be defined as paying attention in a particular way: on purpose, in the present moment, and non judgmentally way. Mindfulness is the ability to direct the attention to experience as it unfolds, moment by moment, with open-minded curiosity and acceptance. Kabat-Zinn (1994&1996). Mindfulness assist individual to bring one’s complete attention to the present experience on a moment-to-moment basis and suggested that mindfulness involves observing one’s experiences “with an attitude of acceptance and loving kindness Marlatt and Kristeller (1999). The state of being attentive to and be aware of what is happening in the present is mindfulness by Brown and Ryan (2003).

In mindfulness practice, the focus of an individual’s attention is open to acknowledge whatever experience one has, while at the same time, an attitude of kindness and curiosity permits the person to explore whatever appears without even falling victim to automatic judgments or reactivity. Segal et al. (2002). Mindfulness described by
Bishop et al. (2004) is “a process of regulating attention in order to bring a quality of non-elaborative awareness to current experience and a quality of relating to one’s experience within an orientation of curiosity, experiential openness, and acceptance.” Furthermore these authors also note that mindfulness can be contrasted with behaving mechanically, without awareness of one’s actions, in a manner often called automatic pilot. Kabat-Zinn (2003) stated that “mindfulness includes an affectionate, compassionate quality within the attending, a sense of openhearted friendly presence and interest”.

Barendregt (2012) defined mindfulness as follow: ‘One of the beautiful mental factors is mindfulness. During mindfulness one observes the input from the senses in a non-reactive way. This sometimes may happen to us while window shopping... we may look in a manner that is ‘observing’, but not ‘reacting’... It is something that happens naturally every now and then, but it also can be trained to make its occurrence intentionally more frequent.’

Mindfulness can be explained as a process of developing a nonjudgmental, accepting awareness of moment-by-moment experience Bishop et al., (2004); Kabat-Zinn ,(2005). This involves intentionally attending to one’s ongoing stream of sensations, thoughts, and emotions as they arise, without evaluating these phenomena as good or bad, true or false, healthy or sick Baer, (2003).

Bishop et. al. (2004) operationally defined mindfulness as consisting of two components: self-regulation of attention and a curious and accepting attitude towards experience. In other words it can be explained as a mental state which comprises of consistent and flexible attention to the present moment in a non judgemental attitude involving curiosity, openness and acceptance. It further leads to change in perception, enhances insight, choice and thoughtful action. Miners, (2008) conceptualized mindfulness an enduring disposition and a fluctuating state. Mindfulness enhances state level through a variety of informal and formal meditative practices.

Mindfulness is about being alert and aware which involves tracking experience moment by moment without being limiting oneself by automatic responses, judgements and expectations and it’s just opposite of being distracting or daydreaming. The mindfulness practice brings awareness, reflection and choice- and is the contrary of being on autopilot.
Mindful awareness permits to perceive challenging situations in more adaptive way, experiencing them with clarity, and then responding in a skilful way (attentively and non judgmentally). Mindfulness practice enhances attention and awareness to cognitions, emotions, and sensory perceptions “in the moment.” The regular practice of mindfulness develops the capacity for non judgemental observation and attitude which in turn reduces mindless reactivity and decreases the automaticity of maladaptive thoughts, emotions, and behaviour.

Mindfulness practice is the mental orientation of mindfulness which enhances individuals mental /emotional flexibility & clarity to deepen one’s enjoyment of life furthermore assist in adapting the life situations. Davis, Fleming, Bonus, Baker, (2007).

The mindfulness practice is a way to strengthen attention skills, develop self awareness and improve emotional wellbeing. Increasingly now mindfulness is being successfully used for the treatment of physical and mental problem such as chronic pain, stress, depression, anxiety and addiction. Over the past several years many studies have been conducted on mindfulness at academic centre around the world which shows beneficial results for different group of people ranging from medical student to patients with depression to elementary school children and improvement in mental health symptom and greater sense of well being. Studies in neuroscience also point towards the ability of mental exercises such as mindfulness to enhance the brain circuit responsible for attention and emotion regulation.

Brown and Ryan, (2003) added in the literature that mindfulness intervention is connected with positive affect, greater relationship satisfaction whereas reduces relationship stress Barnes et al. (2007) mindfulness has inverse relation with less anxiety and depression as reported by Baer et al. (2006 & 2008), research with
mindfulness by Creswell et al. (2007) that greater emotion regulation during affect labelling is being connected with specific profiles of brain activity.

Baer et al. (2006) ; Camody and Baer (2008) reported that mindfulness has been pigeonholed as it encompasses five skills: 1) acting with awareness, 2) observing, 3) describing, 4) non-reactivity to inner experience, 5) non-judging of inner experience” which represent a higher order of mindfulness factor. Each of these mindfulness skills is also highly associated to other psychological processes which are further described by Baer et al. (2006) as follow:

1.21 Traits of Mindfulness

I. The **acting with awareness** means paying attention or spontaneously observing things such as sensation, thoughts, feeling and actions interact with each other. Mindfulness is just opposite of absent-mindedness.

II. **Observing** brings intentional focus of attention on stimuli paying full attention what one is doing, acknowledging it and not being absent minded or automatically.

III. **Describing** means giving words to describe or label what one is thinking, feeling or experiencing. This skill has a quality of an emotional awareness as suggested by Baer et al. (2006) and is significantly related to emotional intelligence and inversely to alexithymia. Observing and describing skills consider cognitions, affects, and somatic sensations of present experience.

IV. The **non judging** aspect in mindfulness therapy concentrates on de-centering from mental events and allows thoughts to be considered just as thoughts or affects to be regarded just as feelings rather than over identification of them. It involves being neutral and less reactive to experience and emotions. Non judging takes in consideration that one should be having acceptance for experience and thus can nurture the ability to maintain and which assist in getting touch with less comfortable thoughts and feelings (Brown et al. 2007b) and this skill is just opposite of coping strategies such as avoidance and thought suppression Baer et al. (2006).

V. **Non reactivity** component involve the behaviour of self regulation that is non automatically reacting to ones thoughts or feelings. Heppner and Kernis (2007) described that an individual who brings skill of non reactivity in daily routine
life are less likely to interpret the behaviour and found to be non revengeful and less aggressive behaviour.

Mindfulness practice enhances psychological well-being by developing de-centering, acceptance, exposure, and self-regulation Allen, (2006); Baer, (2003); Bishop et. al., (2004); Chambers, Lo & Allen, 2008; Hayes & Feldman, (2004); Hooker & Fodor, (2008); Thompson & Gauntlett-Gilbert, (2008). Mindfulness allows one to observe internal experience with detachment and monitor the content of thoughts without judgment or self-censorship. Further in addition to this detached self-observation permits one to calmly recognize and contemplate potential coping strategies without reverting to habitual patterns of response to a problematic situation. This leads to reduction in impulsivity. In the process of mindfulness individual learn that the thoughts and feelings are not labelled as “good” or “bad,” they are just viewed as passing mental events which further entails the quality of being impermanence. This attitude of non judgment, acceptance and openness to experience allows individual’s previous suppressed thoughts to enter the field of awareness. Chawla & Ostafin, (2007) stated that repeated exposure to stressful thoughts leads desensitization and reduces emotional reactivity. As a result, experiential avoidance, associated with psychopathology, may be reduced. The tendency to act on “auto-pilot” gets reduce with the constant monitoring of thoughts-feelings, and regulation of cognitive processes. This self-regulation of attention, cognition and emotion is executive control.

1.22 Elements of Mindfulness

Shapiro et al. (2006) proposed three primary elements as components in the process of mindfulness: attitude, attention and intention. The attitudinal component encompasses non-judgment, acceptance, trust, patience, non striving, curiosity and kindliness mindfulness practice is grounded in particular attitudinal foundations. Bishop et al. (2004); Kabat- Zinn (1990); Shapiro et al. (2006) furthermore, the element of attention indicates focus, broad, sustained attention, and skills in switching attention from one stimulus to another. The third element of conscious intention extends from an intention to practice, the intentionality one brings to directing, sustaining or switching attention. Bishop et al. (2004) reported that this kind of intentional attention can be regarded as the self-regulation of attention.
The process of mindfulness element’s i.e. attitudes, attention and intention all are interconnected reported by Shapiro et al. These elements of mindfulness inculete the skill of de-centring one’s perspective for one’s experiences in a non-judgmental, objective and non-elaborative stance; witnessing or observing thoughts, sensations and emotions as transient phenomena. Furthermore, Baer (2003); Segal et al. (2002); Shapiro et al. supported the same notion that this considerably leads to clearly observe recognize and disengage from habitual patterns or mind states, and begin to respond more reflectively, rather than reactively.

Bishop et al., (2004) described self regulation of attention as a key component of mindfulness which emphasizes on the skill of focusing and regulation of attention on the immediate experience by observing and attending to ongoing stream of thoughts, feelings and sensation from moment to moment. Furthermore added by Bishop et al., (2004) the inculcation of this skill in behaviour leads to a feeling of being alert to what is happening here-and now the self regulation of attention involves two specific skills: sustained attention and skills in switching. The first is skill is of sustained attention which refers to the state of watchfulness over prolonged periods of time and enables to maintain awareness of current experience (Parasuraman, (1998); Posner & Rothbart, (1992) the second skills is of switching which focuses bringing attention back to a mindful focus (e.g., the breath) once an internal experience has been acknowledged. Posner, (1980) added that skill of switching engages flexibility of attention which assist individual to shift the focus from one object to another.

Mindfulness therapy has been incorporated into several manualized treatment programs, for example the most common form of mindfulness intervention for adults found to be in ‘the eight week course’, a course, usually experienced as one weekly two to three hour session spread over eight weeks, which aims to reduce stress or to prevent depressive relapse Mindfulness Based Cognitive Therapy for depression relapse prevention (MBCT; a therapy recommended by the UK National Institute for Clinical Excellence NICE, (2009), Ma & Teasdale, (2004); Teasdale et. al., (2000). for recurrent depression.) Mindfulness Based Stress Reduction for chronic pain and stress-related disorders; MBSR; Kabat-Zinn, Massion, Kristeller, & Peterson, (1992), Dialectical Behaviour Therapy DBT; Koerner & Linehan, (2000) for bipolar personality disorder; and Acceptance and Commitment Therapy ACT; Hayes, Luoma, Bond, Masuda &
Lillis, (2005). A range of interventions for children and young people have also been started and getting introduced in schools and in clinical contexts.

### 1.23 Mindfulness programs specially designed for children & adolescents

Kaiser Greenland (nd), founder of the Inner Kids Foundation in Los Angeles, has worked with inner city school children in Los Angeles for several years and has observed that the children who practice mindfulness have a felt-sense of balance, a calm, focussed mind and are creative and compassionate. Children have a clearer idea of what they want to do, set goals more easily and desire to make a positive impact in the world.

**Wellness Works** is a mindfulness programme introduced for children and adolescents in Lancaster, Pennsylvania which emphasizes on building mental competencies such as increased awareness, concentration and problem solving skills. Kinder, (2008) added that there is a strong emphasis on the mind/body connection through mindful movement. In this programme teachers were asked to complete behaviour rubrics developed by Wellness Works after ten fifty minute mindfulness sessions, and it was found that an overall 73% improvement in mental, emotional, physical and social competencies Kinder (2008a). And further these finds were confirmed in three other settings. Wellness Works is engaged in collaborative research with Dr. Cheryl Desmond, from Millersville University in Pennsylvania, which focuses on students of secondary school with special needs such as autism and other in special classes for emotional and learning support Kinder, March/April (2009). Professional training in mindfulness practices is being provided for special education teachers as well Kinder, January/February (2009). Further teachers report added credibility to the argument in favour of this type of intervention for children in crisis.

The Hawn Foundation is another globally aspiring universal programme which combines mindfulness with social and emotional learning. Schonert-Reichl and Hymel (2007) reviewed that “MindUP” programme included mindfulness exercises with social, emotional, attentional and self-regulation strategies which assist in promoting the development of well-being. Although the study was not methodologically robust, involving teacher report and a before and after design however it has showed improvements in behaviour, attention and focus in 9 to 13 year-old children.
“Learning to BREATHE” mindfulness programme developed by Broderick and Metz (2009) and it has been derived from the curriculum of MBSR. The non randomized quasi-experimental pilot trial was carried out with one hundred and thirty seven of age range of 17 to 19 year-old female students in an American which further revealed that decreases in negative emotions, physical symptoms such as tiredness and aches and pains and increases in awareness, calmness, relaxation, self-acceptance, emotional regulation, and clarity.

Napoli, Krech and Holley (2005) reported on a project related to younger kids having high anxiety age ranging between 5 to 8 years and mindfulness programme was integrated with relaxation techniques. The research study used an RCT design with 228 participants who participated in the Attention Academy Program intervention, which focused on was twelve sessions of mindfulness of each 45-minute and further relaxation session continued over 24 weeks. And it was concluded in the post treatment measures that the participants shown significant improvement in self-rated test anxiety, attention, social skills and selective (visual) attention.

The Mindfulness-Based Wellness Education (MBWE) is a programme specially designed for teachers which focus to address the issue of stress and burn out and it being conducted at the Ontario Institute for Studies in Education of the University of Toronto (OISE/UT). The programme is based on MBSR and involves 9 weeks sessions over 36 hours. The MBWE emphasize on positive wellbeing, applies mindfulness and wellness to teaching strategies such as reflective practice, professional identity, emotional competence and mindful listening. Poulin et al.(2008; 2009), reported from a controlled 2 year study that the MBWE course improve teaching self-efficacy and physical health at immediate follow up; a longitudinal study is underway with teachers who have participated in MBWE into their first years of teaching.

The Cultivating Awareness and Resilience in Education (CARE) is being carried out at the Garrison Institute in New York, San Francisco, Denver and Philadelphia. This programme focuses on to improve teachers’ overall wellbeing, their effective in providing support for students’ emotional wellbeing, behaviour and learning, their relationships with students, to improve classroom environment and enhancing students’ pro-social behaviour. Strategies include in this intervention programme is to assist teachers recognize and manage emotions in themselves and others; and mindful
listening to increase their understanding and empathy for their students and colleagues Jennings, (2011), Jennings and Greenberg, (2009).

The **Stress Management and Relaxation Techniques (SMART)** is a programme for teachers and administrators in educational setting. It is 8 week MBSR programme and includes components which focus on concentration and attention, on awareness of emotion and empathy and on compassion. This programme is currently being implemented in Colorado and Vancouver and Jennings, (2011) as reported from this programme that the teachers interactions with students and colleagues has positively influence, increased their own level of mindfulness, decreased their level of stress and increased their work motivation.

Increasingly mindfulness is attaining hold in the health services, occupational health and in education sector. Presently plethora of research, books, training courses and projects connected with the development and evaluation of mindfulness based interventions is available.

Mindfulness practitioners are more able to respond skilful to whatever is actually happening. Whereas the state of mindlessness indicate rarely or without even noticing the present moment, ruminating on the past or worrying about the future and making unhelpful judgments coloured by ingrained preconceptions and beliefs. Williams and Penman, (2011) documented that living mindlessly is often associated with a sense of stress as one’s experiences frequently fall short of one’s expectations, joys and pleasures.

Numerous research studies suggest supportive evidence about the use of mindfulness meditation as a complementary or alternative treatment for a range of health and mental health issues. Studies strongly suggest that the mindfulness training improves attention-related processes, such as sustained attention Chambers, Lo & Allen, (2008), alerting and orienting Jha, Krompinger & Baime, (2007).

### 1.24 Application of Mindfulness Therapy with children & adolescents

Mindfulness interventions has been implemented healing pain management with adolescents by Thompson and Gauntlett-Gilbert (2008), Mindfulness Based Cognitive Therapy has been employed with adolescent patients for preventing depressive relapse by Allen (2006). Many other studies and pilot projects has been executed at different centres such as the Oxford Mindfulness Centre, Mindful Awareness Research Centre,
University of California Los Angeles, Inner Kids Foundation, and Greco and Hayes (2008) reported that the many recent publication of a practitioner’s guide focusing on treatment of children and adolescents.

Greenberg et al. (2001) reported that recent era is witnessing a myriad of social, emotional, and behavioural problems associated with school aged children, further interfere with their interpersonal relationships, school success, and their potential to become competent adults and productive individual. Epidemiological reports by Romano et al. (2001); U.S. Public Health Service (2000) on prevalence rates of disorder, point out that mental health problems are increasing with approximately one in five children and adolescents experiencing problems which warrant the need for mental health services.

Several of the studies cited above example of Flook et al, (2010); Schonert-Reichl and Hymel, (2007); Semple et al., (2005) and Beauchemin et al, (2008) revealed that mindfulness to have significant positive effects on intellectual skills, improving sustained attention, visual-spatial memory, working memory, learning, and concentration in adults and children. It has been found by different researchers that mindfulness assist children and young people learn to be more focused & attentive, approach situations with fresh perspective and improves the quality of performance in the classroom and become less anxious. Napoli, Krech & Holley (2005) stated that all these empirical evidence suggest the significance of mindfulness in school setting and furthermore its impact on cognitive skills, social and emotional learning and wellbeing is likely to appeal to all schools. All these promising results indicate that work on mindfulness could be implemented within mainstream school subjects.

Recent studies on Attention Deficit Hyperactivity Disorder (ADHD) and also for non-clinical samples investigated the effects of a mindfulness meditation approach and which revealed significant cognitive changes, particularly related to attentional processes such as alerting, orienting, conflict attention and attentional set-shifting. Zylowska, Ackerman, Yang, et al., 2008; Jha, Krompinger & Baime, (2007)

It was found from studies that different individuals respond to intervention at their own pace, but over time, individuals are more open to learning, less anxious and can concentrate for longer periods of time. Langer (1989) confirms from research that through the practice of mindfulness, one can enhance confidence, awareness, learning
and the relationship between the student and the teacher Langer, (1997). As Langer’s findings are based on many years of studies and research which have good reliability and credibility.

Increased focus, awareness and reduced anxiety/restlessness might advocate that mindfulness would be helpful for individual with Attention Deficit Hyperactivity Disorder (ADHD). Langer and Kaplan (1997, 1998) based on extensive research through several long range studies, supported the specific notion that mindfulness and mindful learning practices assisted with students having ADHD, will reduce distraction and increase focus include creating new categories, being open to new perspectives and new information.


Semple, Reid, and Miller (2005) and Reid, Semple, and Miller (in press), in a 6-week, open clinical trial with 7- and 8-year-old children, found preliminary support for the feasibility and acceptability of treating childhood anxiety with cognitively based group mindfulness technique. Further it was followed by a randomized controlled trial (RCT) of the manualized 12-week MBCT-C psychotherapy protocol with children aged 9–12 years Semple, Lee, & Miller, (2004) and found significantly reduction in attention problems, as reported on the attention subscale of the Child Behavior Checklist, Parent Report Form Achenbach, (1991).

Linden (1973) studied the effect on cognitive and affective functioning of third-grade children with the training of meditation and it was found from the study that after 18 weeks of meditation practice, children became less anxious about test taking. He also hypothesized that meditation practice may help children to concentrate and volitionally modify the feeling states by shifting their attention.

Goleman, (1996; 2006) reported that mindfulness is associated with the significance of emotional intelligence and coping skills in different contexts such as the school, the workplace, the home and the family. The studies on mindfulness has reflected positive effects on emotional and social qualities in both adults and children such as the skill of mindfulness develops the ability to feel calm and to manage one’s emotions, assists in
making meaningful relationships and to be nonjudgmental attitude, resilient, compassionate and empathic whereas observe & accept the experiences without rejecting the reality. Miners, (2008) described that the mindfulness trait can be either found as a temperament or can be develop through training so adolescents who are mindful, tend to experience greater well-being; furthermore he put emphasizes that mindfulness has been found to be associated with positive emotion and friendship however have inverse relation with negative emotion and anxiety.

1.25 Mindfulness & Neurosciences- A scientific Approach

Mindfulness approach is well acknowledged in the area of neuroscience. In the last several years there has been a lot of researches revealed that the brain can grow and change throughout life-quality called neuroplasticity. The term derived from two words: neuro related to brain and plastic means pliable or changeable. The brain has been shown to change in response to one’s experiences, especially when the experience is repeated. Further the concept of neuroplasticity has been found to be associated with the mindfulness training by Davidson and Lutz, (2008) as the study conducted by them revealed that the brain-imaging studies of adults have profoundly alter the structure and function of the brain associated with attention and emotional integration and produces, greater blood-flow and a thickening of the cerebral cortex with the practice of mindfulness meditation. Furthermore he demonstrated that the pre-post analysis in study with participants involved in 8 week training on mindfulness found to have increased grey-matter density in the areas of the brain associated with learning, memory, self-awareness, compassion, introspection, and reduced density in areas associated with anxiety and stress.

Individual with ADHD has difficulty in sustaining attention for longer period of time and once distracted from the task or activity then it become difficult for them to bring their attention back on the track. So the mindfulness therapy inculcates these skills to overcome difficulties.

1.26 Rationale

After the thorough study of the ADHD and mindfulness the rationale for using a mindfulness therapy with ADHD has been constructed on multi level i.e. cognitive, behavioural and affective domain. As mindfulness therapy implies that through art of mindfulness individual learn to control arousal levels and restrain them from automatic
responses by achieving awareness and learn to exercise better self-regulation which assists them in management of ADHD symptoms Zylowska et al, (2008). It has been demonstrated in literature that through mindfulness therapy one involves in the process of continue self awareness and regular monitoring which further allows individual to recognize such automatic ADHD-related patterns and help them in considering alternative ways. The mindfulness therapy guides one to bring attention to a neutral stimulus (e.g., breath) which helps them to disentangle from particularly increased emotional states.

The present research entitled “Effect of Mindfulness Therapy on Cognitive, Behavioural and Affective Well Being of Adolescents Manifesting Symptoms of Attention Deficit Hyperactivity Disorder” has been planned to find out the specific implications. To our knowledge, this is the first study in India to explore the impact of mindfulness therapy on ADHD symptoms. As reported by Teasdale, Segal, & Williams, (1995) that the mindfulness therapy improves self-regulation of attention and emotion and it has also been stated by Barkley, (1997) that the ADHD adolescents often lacks these skills and it could be an ideal treatment for this population.

Mindfulness therapy cultivates a great sense of self-awareness which assist individual to identify their impulses, distracters and purposeless behaviours before reacting on them, therefore regulating on the ADHD symptoms. So on the basis of available literature and cited studies in the field of ADHD and mindfulness the present study was thereby carried out.

1.27 Objectives:-

1. To study the effect of mindfulness on attention of adolescents manifesting symptoms of attention deficit hyperactivity disorder.
2. To study the effect of mindfulness on executive functions of adolescents manifesting symptoms of attention deficit hyperactivity disorder.
3. To study the effects of mindfulness on hyperactivity of adolescents manifesting symptoms of attention deficit hyperactivity disorder.
4. To study the effects of mindfulness on conduct problems of adolescents manifesting symptoms of attention deficit hyperactivity disorder.
5. To study the effects of mindfulness on peer relations of adolescents manifesting symptoms of attention deficit hyperactivity disorder.

6. To study the effects of mindfulness on learning problems of adolescents manifesting symptoms of attention deficit hyperactivity disorder.

7. To study the effects of mindfulness on memory of adolescents manifesting symptoms of attention deficit hyperactivity disorder.

8. To study the effects of mindfulness on anger of adolescents manifesting symptoms of attention deficit hyperactivity disorder.

9. To study the effect of mindfulness on impulsivity of adolescents manifesting symptoms of attention deficit hyperactivity disorder.

10. To study the effect of mindfulness on emotional problems of adolescents manifesting symptoms of attention deficit hyperactivity disorder.

11. To study the effect of mindfulness on self esteem of adolescents manifesting symptoms of attention deficit hyperactivity disorder.

12. To study the effect of mindfulness therapy on the attention awareness of adolescent manifesting symptoms of attention deficit hyperactivity disorder.