Chapter 2

Review of Literature

2.1 Empirical Studies on Mindfulness

Mindfulness is described as non-evaluative and present-centred awareness that emerges from the intentional focus and refocus of attention on sensations, thoughts and feelings as they arise on a moment-by-moment basis Williams, Teasdale, Segal, & Kabat-Zinn, (2007); Ortner, Kilner & Zelazo; (2007); Semple, Reid & Miller, (2005); Zylowska et.al., (2008). Mindfulness is an intervention which is based on eastern meditation techniques, that helps increasing awareness of the present moment, enhances non-judgmental observation, and reduces automatic responding Kabat—Zinn (2003).

Mindfulness meditation was introduced and developed as a way to reduce the stress and pain associated with chronic illness of patients who had exhausted all other modes of medical intervention as reported by Kabat-Zinn (2005, 2003) and colleagues (1985). It was found that a focused 8-week group programme of mindfulness meditation facilitate an improvement in the overall sense of well-being and sense of control and management of health of patients. The concept and/or construct of mindfulness have been explored by different researchers in their studies Dunn, Hartigan & Williams, (1999); Valentine & Sweet, (1999), educational Hassed, (2002 & 2004); Rosenthal & Okie,(2005); Shapiro, Schwartz & Bonner,(1998), clinical and personal practices Segal, Williams & Teasdale, (2000).

Kostanski and Hassad (2007) denote that mindfulness is a cognitive style that fosters an increased sense of awareness of thought processes and emotions. This awareness in turn leads to cultivate the ability to engage actively in being, rather than reacting or doing. Living mindfully indicate of being fully connected with all the bodily senses and not to get engaged in with mental chatter (anxiety or ruminating thoughts), which further inculcate the skill of openness, acceptance and to act appropriately in response to life situations. In addition mindfulness is also considered to be an inherent dispositional trait within the individual however research study has shown that this skill can be developed and enhanced through specific meditation training and reinforcement Kabat-Zinn, Lipworth, & Burney, (1985); Segal, Williams & Teasdale,(2002).
In the literature on positive psychology, mindfulness has been identified as beneficial dimension to well being and it has received attention across numerous academic and clinical disciplines. Kabat-Zinn (2003); Singh et al.(2003); Siegel (2007); Zylowska et al.(2008).

Scientific researches has demonstrated that mindfulness meditation assist individual to become less reactive Cahn & Polich, (2009); Goldin & Gross,(2010); Ortner, Kiner, & Zelazo, (2007); Siegel, (2007a, 2007b) and develops greater cognitive flexibility (Moore & Malinowski,(2009); Siegel,(2007a,2007b).Studies indicates that mindfulness meditators develop the ability of self-observation that neurologically disengages automatic pathways and further create and integrate the present moment input in a new way Siegel, (2007a).

2.2 Mindfulness with clinical sample of children and adolescent

Semple and Lee, (2008) found that with mindfulness training children with anxiety disorders develops a better and changed way of thinking which enables them to focus on the present moment, permits them to be more aware & able to meet challenges effectively of day to day routine and prevents them from getting stuck in rumination of thoughts.

Biegel et al. (2009) conducted a modified 8 week MBSR course on one hundred and two children age ranging between 4 to 18 year olds with a wide range of diagnoses. The participants who received MBSR self reported significantly reduced symptoms of anxiety, depression, and somatic distress, global assessment of functioning and increased self-esteem and sleep quality as compared with the control group. Further follow up at 3 month those who practiced mindfulness more showed improved clinicians’ ratings of anxiety and depression as compared with those who did not.

Bootzin and Stevens (2005) employed mindfulness intervention on 55 adolescents age ranged between 13 to 19 years with the sleep problem and substance abuse. The intervention programme has 6 sessions which included components of Mindfulness Based Stress Reduction (MBSR) and insomnia treatment. It was concluded from the research that there was considerable reductions in mental health distress and improvement in sleep. After the follow up of 12 months the participants who continued with regular practice showed decreased substance use as compared to participants who did not continued.
Sibinga et al. (2011) conducted an 8-week MBSR program with 33 youth aged 13-21 years from pediatric and adolescent clinics in an urban academic hospital, and the result of the study reported significant reduction in self-reported levels of emotional discomfort and hostility, and perceived improvements in school achievement, health, relationships, levels of conflict, and stress.

According to Eisenberg, Sadovsky, and Spinrad (2005), the emotional regulation has a key influence on children’s focus, motivation, and academic competence and success in school.

It has been documented by Hofmann et al. (2010) that mindfulness therapy has shown promising results with adults suffering from depression, anxiety, and eating disorders, where it reduces aggression. In the light of a review of literature, the only few non-controlled case studies of ADHD samples of age range were between 10-14 years old, using a non-controlled pre-post design, demonstrated reduced attention and overall problems associated with ADHD after transcendental meditation. Grosswald et al. (2008); Singh et al. (2010); Zylowska et al. (2007)

2.3 Mindfulness with non-clinical sample of children and adolescent

The bulk of studies carried out with adolescent age groups have been focused on challenging behavior or psychiatric conditions and special educational needs. It has been proposed by Davis (2012) that mindfulness should be considered for inclusion in educational psychology practice generally. Further, it was added by van de Weijer-Bergsma et al., (2012); Singh et al., (2010), mindfulness has specified significant positive improvement with adolescents having ADHD. Dumas, (2005); Eyberg and Graham-Pole, (2005) also documented that benefits have been found with disruptive children and their parents. Singh et al., (2011) concluded from the research that mindfulness has been effective in the controlling aggression in Aspergers adolescents and with children in need (including those on the child protection register) Coholic, (2011). Disturbed adolescents with HIV/AIDS Sinha and Kumar, (2010) and psychiatric populations Brown et al., (2011); Biegel et al., (2009).

Lantieri (2008) remarks that mindfulness quiets the chatter in our brains, slows down so that daily life challenges could be met easily and are able to focus on one thing at a time which also enhances children’s learning potential. In addition to this Kinder
(2008) demonstrated that 10-15 minutes mindful session revealed considerable improvement in mental, emotional, physical and social competencies.

Mendelson et al. (2010) conducted mindfulness based intervention programme on nine and ten year olds children from disadvantaged backgrounds, which included yoga-based physical activity, breathing techniques and guided mindfulness practice to improve the ability to self regulate. The significant difference was noticed on pre and post measures of involuntary response to stress (meaning automatic and physiologically-mediated responses such as rumination and intrusive thoughts) and greater trust in friends.

Little researches have been conducted involving the specific application of mindfulness to the treatment of ADHD symptoms Smalley et al., (2009). In support to this, Black et al. (2009); Burke (2010) stated that there are emerging researches on the efficacy of mindfulness for children and adolescents with psychopathology. However, limited studies have been documented and conducted in the field of children sample as compared to adults.

2.4 Mindfulness and ADHD

Zylowska (2008) reported an individual with ADHD develops meta-awareness, the ability to be aware of their attention and to monitor and remember where attention goes. In addition to this she further observed that individuals with ADHD usually have self critical thoughts about themselves and their abilities however through mindfulness therapy assist ADHD people to accept themselves and channelize their strengths in managing challenges. Furthermore added by Zylowska (2008) that at the core of mindfulness is acceptance and mindful self –coaching voice has an ingredient of supportive, compassionate void of self-criticism and harsh personal judgments.

Zylowska (2008) revealed through mindfulness training ADHD adults have become mindful about their actions and are less driven by outside distractions or inner reactions. Mindfulness inculcates the skill to better self-regulate and better able to observe an impulse arising without acting on it. People with ADHD reported to manage strong emotions in a better way which in turn creates the sense of empowerment rather than feeling of frustration. It was also documented by Zylowska that ADHD individual when get lost in inner stream of thoughts or outside environment but through practice of mindfulness therapy they usually won’t stay lost for too long.
Nirbhay Singh (2010) conducted a pilot study in which two mothers having ADHD children were given mindfulness intervention to study the effect of parental mindfulness on the child’s behaviour. It was reported by mothers that after mindfulness therapy they have found increased compliance in children’s behaviour even though no specific parenting instructions were given to the mothers. Many studies have revealed that with the similar kind of mindfulness training with children has also shown greater impact.

A study was conducted by Saskia van der Oord and her colleagues at the University of Amsterdam, (2011) with twenty-two ADHD children aged eight to twelve have undergone eight-week mindfulness training simultaneously parents of these children received mindful parenting program. The findings suggested improvements in children with ADHD symptoms (but not ODD symptoms) and at the same time reported to have decreased in overactive parenting, and parental stress.

In discussing the application of mindfulness to ADHD, we focus on “mindful awareness” as meta awareness, Teasdale et al., (2000) a quality of consciousness that has a regulatory function on the rest of the one’s experience and leads to improved cognitive-emotional and behavioral self-regulation Brown & Ryan, (2003); & Creswell, (2007). Mindful awareness could be seen as a specific quality of attention and intention Bishop et al., (2004); Brown & Ryan, (2003); Shapiro, (1982) that leads to monitoring and modulation of cognition, emotion and behavior resulting in improved awareness and flexibility in responding. The processes involved in this regulatory function have been diversely described including de-centering, de-automatization Teasdale, Segal, & Williams, (2003), exposure Baer, (2003), attention regulation to the present moment and adoption of open and accepting attitude Bishop et al., (2004); Hayes, Follette, & Linehan, (2004); Kabat-Zinn, (1990)

Kinder, (2008) has emphasized on the association of mind and body through mindful movement. Although the implication of mindfulness with ADHD is still very new, results have been promising so far. Benson, (1997); Kabat- Zinn, (1990) reported that ADHD individuals can be benefitted by mindfulness training and other mind-body approaches via induction of the relaxation response. It may be valuable for children with concentration problems and those with ADHD to practice mindfulness as to improve their attention and focus.
Langer and Kaplan (1998) suggest that mindfulness training will reduce distraction and increase focus or concentration. Zylowska et al. (2008) found that the mindfulness meditation conducted with both twenty-four adult and eight adolescents with ADHD which revealed that the people with ADHD develops the ability to control attention and emotion by re-orienting and focussing attention on the events of present moment, being open, accepting and interested in whatever is presented. Furthermore it was also reported that the adolescents with ADHD reflected significant improvement in tasks measuring memory, attention and cognitive inhibition, anxiety and depressive symptoms.

Bogels et al (2008), implemented mindfulness intervention programme on a 14 adolescents age ranging 11 to 18 years diagnosed with attention and behaviour-control deficits. The significant improvement was observed by parent on dimensions of personal goals, sustained attention, happiness and mindful awareness.

The article published in magazine by Goleman (2014) gave the quoted from James M. Swanson, a psychologist at the University of California, that the mindfulness assist in training those particular areas of the brain which are involved in reducing the activity level of ADHD along with this he also reported that ADHD medication does not have long lasting benefits. Thus mindfulness is an effective and an important treatment of ADHD. Furthermore a study in clinical neurophysiology also reported that adults with ADD reflected significant and long term improvement in mental performance as compare to subjects under medical treatment.

According to research by Hasenkamp and Barsalou (2012) at Emory University, mindfulness approach to ADHD can appears to facilitate the brain circuitry functions related to sustain attention which is an sign of cognitive control. Furthermore this training helps in reducing the impulsive reactions. In an article of Goleman (2014) a study published in frontiers in Human Neurosciences that the brain images of meditators were taken when involved in the basic mental movements i.e. focus on a selected target, notice when minds gets distracted then again sustaining focus and bringing back mind to the selected target. Thus it can be concluded that the neural circuit get strengthen with such mental movements.
2.5 Mindfulness and Attention

Increasing numbers of studies on mindfulness are looking forward to study its effects on attention. Roeser and Peck (2009) concluded from the studies that mindfulness training has been acknowledged as one way to foster self-regulatory control during adolescence. Mindfulness is a form of mental training which leads to the development of skill in which the individual can direct and redirect attention/awareness to particular kinds of events (e.g., breathing). As posited by Broderick and Metz (2009), the mindfulness therapy promotes the attention, emotional regulation whereas reduces stress and develop the feeling of self assurance in the phase of uncomfortable feelings which otherwise might provoke unhealthy responses such as intake of drugs, violent behaviour or become depressed.

Preliminary studies suggest that mindfulness has potential to improve attention-related processes in adults such as alerting and orienting Jha et al. (2007), sustained attention to internal events Chambers et al. (2008); Valentine and Sweet (1999) and conflict monitoring Jha et al. (2007); Zylowska et al. (2008). In another controlled research study using the Attention Network Test (ANT) it was observed that the mindfulness training builds on both concentrative and receptive attention Rueda, Fan, Mc Candliss, Halparin, Gruber, Lercari, & Posner, (2004), Jha, Krompinger, & Baime (2007).

Siegel (2007) also depicted that mindfulness awareness practices (MAP) is associated with improved neural pathways and brain activation in the prefrontal cortex, further improving self regulation and awareness. Moore and Malinowski (2009) reported that the experienced mindfulness had significantly showed better performance on all measures of attention as compared to controlled group.

Mindfulness meditation was imparted to both twenty-four adult and eight adolescents with ADHD, to improve their ability to control attention and emotion by focussing attention on the events of present moment, being open and interested in whatever is presented Zyklowska, Ackerman, Yang, Futrell, Horton, Hale, Pataki, & Smalley, (2008) improvements were observed by participants in attention span and cognitive inhibition as well as a reduction in anxiety and depression.

Emerging scientific studies in the area of meditation training in different non-clinical or clinical population reflects potential modification in attention and their network. An empirical study conducted by Jha (2007) demonstrated that long term meditator's
shows significant improvement in alerting attention however with novices (less-intensive) training impacted orienting attention. Furthermore it was conclude that long-term meditator's appeared to have better conflict attention abilities as compared to novices at the beginning of the study.

A research conducted by Jha (2007), at the University of Pennsylvania demonstrated that participants in an eight-week mindfulness program or one-month meditation retreat showed improvements in different facet of attention as compared to control group.

A collaborated study carried out by Maclean (2010), at Johns Hopkins University, researchers at University of California – Davis, and the meditation teacher and scholar Alan Wallace on a group of adults for intensive three-month meditation training. This training involved five hours a day of meditation, it focuses on sustained attention on the breath. After three months of practice participants found to have enhanced sharpened visual perception and were more alert when paying attention to any stimuli. Further it may foster the ability of sustained attention.

It has been concluded from twenty three controlled mindfulness researches which targeted attention as a measure attention indicated that initial phase of mindfulness training is associated with significant improvement in selective and executive attention whereas later phases bring improvement in alert, sustained attention as reported by Chiesa, (2011). The review of study calls for larger studies, but however mindfulness training confirms to improve attention.

Literature on meditation studies reveals that brain structure for the development of conflict attention, self-control and the modulation of cognition and emotion in adults involve activation of the anterior cingulated (ACC) and the prefrontal cortex, Cahn & Polich, (2006). It was found in studies that are carried out by different scientist on long-term meditators did not show typical age-related declines in attentional performance and had less age-related gray matter volume reduction in several brain regions, particularly the putamen as compared to healthy control group individuals Creswell, Way, Eisenberger, & Lieberman, (2007); Lieberman et al., (2007). Pagnoni and Cekic (2007). Additionally, Slagter et al., (2007) reported that experienced meditators after an intensive 3-month training showed significant improvement were noted on an attentional blink test, or more effective allocation of attentional resources.
Bishop et al., (2004); Brown & Ryan, (2003); Shapiro, (1982) reported mindful awareness could be considered as a quality of attention and intention which further leads to monitoring and modulation of cognition, emotion and behaviour ensuing improvement in awareness and flexibility in responding.

2.6 Mindfulness & Emotions

Research demonstrates that meditation may evoke positive emotions whereas minimize negative emotions and rumination further enabling individual with an effective emotional regulation. Williams, (2010) reported that eight weeks of mindfulness practice may alter the ways in which emotions are being regulated and processed in the brain. Emotional regulation is balancing emotions that in turn lead to psychological resilience and being able to control strong impulses. It is an ability to balance out or modulate one’s emotions and not blowing up when feeling angry, but it also doesn’t mean to suppress anger when something is wrong. It has been revealed by research work of barkley (2010) that the ADHD individuals have difficulty in regulating their emotions. Research has also documented that ADHD adults have difficulty in controlling impulsive reactions as compared to their peer group which in turn leads to work and relationship problem. As it has been reflected in different studies on ADHD that these individuals are more prone to depression, anxiety, and substance abuse for all such conditions are often fuelled by underlying problems with emotion regulation.

Emotion regulation has such strong empirical evidence as a benefit of mindfulness practice that the term “mindful emotion regulation” was coined to refer to “the capacity to remain mindfully aware at all times, irrespective of the apparent valence or magnitude of any emotion that is experienced” Chambers, Gullone, & Allen, (2009).

Brown and Ryan, (2003) reported that individuals with high dispositional mindfulness had showed decreased levels of anxiety and depression, and were less vulnerable to neuroticism, rumination, and low self—esteem. It was also found that high dispositional mindfulness is associated with higher emotional intelligence and positive emotions.

A pilot study conducted by Singh, (2007) on three psychiatric patients who had frequently been hospitalized as a result of their anger management problems however when used mindfulness therapy with these patients it was found to have decreased verbal and physical aggression. Further in support to previous research it was also documented by Greeson, (2009) that the mindfulness — based therapies has shown
promising results in case of impulsive emotions such as anger, addictions, binge eating and effectively ameliorated the symptoms. Further scientific controlled experimental mindfulness therapy has shown improvements in emotional control and self regulation Brown, Roderick, Lantieri, & Aber, (2004), confirming the importance of using mindfulness with children with special needs.

Goleman (2008) displayed the results of a meta-analysis of over 100 studies of social emotional intelligence collated by the Collaborative for Academic, Social and Emotional Learning (CASEL) which indicated positive gains for students when engaged in a social/emotional learning programme such as mindfulness. It was concluded from the programme that students learn to calm down and improved their interpersonal relationships, in addition to this academic growth was evident with 14 percentile points higher on achievement tests than those who haven’t participated in social/emotional learning programmes. Keng et al. (2011) reported that mindfulness-based interventions increase positive effect, emotion regulation, empathy, social functioning, satisfaction and quality of life.

Mindfulness training inculcate the skill to regulate emotions in a way that is neither avoidant, flooding, nor dissociative, but rather “mindfully observing and staying present with the emotion.” In addition to this Teasdale et al., (2003) reported that in turn add on curiosity, openness and acceptance/willingness toward emotional experiences as well as a degree of distancing or dis-identifying from the emotion which can be helpful in instance of emotional over-engagement (depression or anger problems) as well emotional avoidance (e.g., anxiety disorders).

Mindfulness training has been revealed to prevent relapse in chronic depression Teasdale et al.,(2001), improve impulsive behavior in clients with borderline personality disorder Bohus et al., (2004), reduce aggressiveness in adolescents with conduct disorder Singh et al., (2007), and improve outcomes in substance abuse Marlatt et al., (2004), and generalized anxiety disorder Roemer & Orsillo, (2007).

Arch & Craske, (2006) documented that mindful awareness state has shown significant reduction in negative affect in response to aversive pictures and emotionally provocative events Broderick, (2005). It was found in studies by different scientist that higher levels of a dispositional mindfulness correlated with buffering of amygdale in
response to negative affect via the prefrontal cortex in an affect labelling task, Creswell et al., (2007).

Mindfulness training may also be valuable for children who are aggressive, as it fosters self-control and self-management. Furthermore, Fontana & Slack, (1997) described mindfulness skill that children become more self aware and focus on themselves, which makes them learn how their mind works, about their thinking process and promotes greater self-understanding of their own experiences of the world, which they do not typically experience.

Bogels, Hoogstad, van Dun, de Schutter, & Restifo (2008) stated that an eight-week MBCT program significantly increases the baseline level of mindfulness through formal training in adolescents ages 11-17, and suggested that adolescents have the cognitive potential to grab the main tenets of mindfulness meditation.

Mindfulness meditation has emerged as a new approach for stress reduction and an important innovation in treating psychiatric disorders Baer, (2003). Arch & Craske, (2006) reported that individuals with mindfulness state have shown tremendous reduction in their reaction to negative emotions and volatility in response to aversive visual stimuli or emotionally provocative events Broderick, (2005). Furthermore, Singh et al., (2007) indicated that a mindfulness-based intervention reduce aggressive behaviour in adolescents with history of conduct disorder.

Kabat-Zinn (1990); Segal et al. (2002) explained that being mindful signify awareness and focus on going current experience versus “automatic pilot,” which engross the behaviour which is out of awareness, attention, and is compulsive or automatic.

In samples of clinic-referred adolescents with ADHD showed significant improvements on objective tests of executive functions, including sustained attention Bogels et. al., (2008), conflict orienting, and set-shifting Zylowska et.al, (2008) in eight weeks of mindfulness training. Mindfulness-based programs also lessen challenging behaviour associated with ADHD.

2.7 The Science of Neuroplasticity and its implications with Mindfulness and ADHD

Neuroscience research has revealed that the brain has “neuroplasticity”, that is, the ability to grow and change, throughout the lifespan. A growing number of studies has
confirmed that brain activity can be altered by repeated behaviour or experience Draganski et al., (2004); Schwartz, Stapp, & Beauregard, (2005b) including mental training such as meditation Lazar et al., (2005); Pagnoni & Cekic, (2007). The effect of neuroplasticity has been demonstrated in animal Nudo et al., (1996) and human (Draganski et al., 2006); Maguire et al., (2000); Mechelli et al., (2004) enduring functional and structural changes in the corresponding neural circuitry after a repeated behaviour. Olesen, Westerberg, & Klingberg, (2004) confirms the results of “neuroplasticity” by conducting a study of cognitive training in ADHD.

A study at Harvard University by Sarah, (2005) demonstrated that long-term meditators had developed thicker brain regions linked to attention, self-monitoring, and emotional processing as when compared to non meditators. Further it was also concluded that the prefrontal cortex of meditators seemed to resist the typical age-related thinning.

### 2.8 Mindfulness and Executive Function

Research conducted on the sample of children and adolescents reflected that the mindfulness training appears to improve attention, executive control, psychological wellbeing and psycho-physiological processes such as blood pressure and heart rate. Barnes et al. (2004); Black et al. (2009); Flook et al. (2010). Furthermore, van der Oord et al. (2011) concluded from clinically referred sample of children and adolescents with ADHD and externalizing disorders, that the mindfulness training is allied with reductions in parent-rated inattention, hyperactivity and impulsivity as well as significant improvements in objective measures of EF including sustained attention Bogels et al. (2008), conflict orienting and set shifting, Zylowska et al. (2008).

Scientific studies has also suggested association between mindfulness and enhanced executive attention, as reflected in studies Creswell et al., 2006 also demonstrated increased behavioural regulation associated with mindfulness and found to have enhanced prefrontal cortical inhibition of amygdala responses during affect labeling. Furthermore, Zylowska et al., (2006) used a modified version of MBSR with adolescents and adults with ADHD found improvements in executive attention. Tang et al., (2007) also supported that five days of integrative meditation including mindfulness showed improved efficiency of executive attention as compared to compared group with relaxation training.
Research conducted by different scientists conclude that the mindfulness-based programs reduces internalizing and externalizing problems including anxiety Bogels et al. (2008); Semple et al. (2005), aggression Singh et al. (2007) and noncompliance Singh et al. (2010). In addition to this Napoli et al. (2005) revealed that students of elementary school i.e. grade 1-3 were enrolled in the Attention Academy Program a school-based mindfulness intervention, showed greater enhancement in overall attention, selective attention, social skills and test anxiety after 12 sessions as compared to the control group.

Evidence is mounting that the school-based mindfulness awareness practices (MAPs) with elementary school students in Grades 2–3 found improvements in behavioural regulation, meta-cognition and global executive control, relative to the silent reading control condition Flook et al. (2010). In addition, research has also demonstrated that a modified MBCT program for 9- to 13- year-olds referred to a clinic based remedial reading program reported significantly reduction in the attention problems as reported by parents after 12 weeks of , relative to wait list controls (WL). Semple et al. (2010) found that after 12 weeks of intervention training there was a 50% decline in elevated anxiety present at the time of pretest in the study that among the small subset of children.

The well established body of research in the area of mindfulness with adults also reflecting promising results emerging from pilot studies and control trail studies conducted with children and adolescents. Furthermore, Baer (2003); Keng et al. (2011) advocated that mindfulness-based therapies have the significant impact on Executive Functioning and psychological well-being in clinical populations of all ages.

Randomized control studies of mindfulness awareness practices (MAPs) of 8 weeks of training with pre-kindergarten and early elementary school students of age ranging between 4 to 9 years demonstrated improved executive functioning as rated by parents and teachers. Furthermore it was confirmed by Flook, Smalley, Galla, Kitil, Kaiser-Greenland et al. (2010) that children with four to five year old demonstrated improvement in working memory, planning and organization whereas it was also revealed that seven to nine year olds shows improvement in behavioural regulation and meta-cognition, with greater effects among those who displayed executive dysfunction prior to the study. The same has been also discussed by Zylowska (2008). So, it can be
concluded that mindfulness training improves attention, executive control and psychological well-being in children and adolescents.

Review of literature revealed that the meditation is also documented as a mental training that could regulate attention and brain function Bishop et al., (2004); Brown & Ryan, (2003); Davidson et al., (2003); Lazar et al., (2005); Schwartz & Begley, (2002); Segal et al., (2002). As posited by Jha, Krompinger, & Baime, (2007) that mindfulness meditation training can modify attentional networks and in nonclinical samples it shows improvement on an attentional blink test Slagter et al., (2007).


Overall, it can be concluded from the review of literature that the mindfulness therapy can be helpful for children and adolescents manifesting symptoms related to psychopathology. The limited researches has been conducted on ADHD adolescents however all reflected positive results. The documentation of researches on mindfulness with ADHD revealed that mindfulness has the potential to reduce hyperactivity/impulsivity, enhances the attentional skills, social skills and balance out emotional turmoil. On the basis of review of literature available the present research has framed the following hypotheses:
2.9 Hypotheses:

1. There shall be positive effect of mindfulness on the attention of adolescents manifesting symptoms of ADHD.

2. There shall be positive effect of mindfulness on the executive functions of adolescents manifesting symptoms of ADHD.

3. Mindfulness therapy shall be helpful in reducing learning problems of adolescents manifesting symptoms of ADHD.

4. Mindfulness therapy shall be helpful in enhancing memory of adolescents manifesting symptoms of ADHD.

5. Mindfulness therapy shall be helpful in reducing the hyperactivity of adolescents manifesting symptoms of ADHD.

6. Mindfulness therapy shall be helpful in reducing the impulsivity of adolescents manifesting symptoms of ADHD.

7. Mindfulness therapy shall be helpful in reducing the conduct problems of adolescents manifesting symptoms of ADHD.

8. Mindfulness therapy shall be helpful in reducing the anger of adolescents manifesting symptoms of ADHD.

9. Mindfulness therapy shall be helpful in enhancing peer relations of adolescents manifesting symptoms of ADHD.

10. Mindfulness therapy shall be helpful in reducing the emotional problems of adolescents manifesting symptoms of ADHD.

11. There shall be positive effect of mindfulness in enhancing the level self esteem of adolescents manifesting symptoms of ADHD.

12. There shall be positive effect of mindfulness therapy on the attention awareness of adolescent manifesting symptoms of ADHD.