Chapter – II

Review of Literature
Review of earlier researches conducted in the same field is an inseparable part of any study because every research/investigation contributes to the understanding of the field. No research can be seen as an isolated effort, but as part of a collective venture in search of the truth. It is quite essential that previous viewpoints and findings regarding the phenomena be taken into consideration.

The present research was conducted with the purpose of finding attributional styles and anxiety sensitivity among asthmatic. It is imperative that the investigator should explore the researches relating asthma to various psychological factors/variables. The second chapter is divided into three parts. In the first part studies relating psychological variables and asthma are reviewed. The second part concerns attributional style and health-related functioning. Third part deals with the studies relating to anxiety sensitivity in various samples. The study of the etiology of asthma dates back to at least to Hippocrates who is credited as being the first to describe asthma. He believed that asthma was caused by a disturbance of humors that had not been cleansed from the brain before birth. Further, in his ‘treatise on Asthma’, the renowned 12th century physician Moses Maimonides initially hypothesized that emotions are associated with asthma (Jones et al., 1999; Munster, 1968). The psychological factors that have been studied so far in relation to asthmatic symptoms are stress, pathogenic family relations, personality pattern, and affective comorbidity like depression, negative affectivity, anxiety and other anxiety related disorders.
The role of stressful life events in the etiology of various diseases has been a fertile field of research. Prior research endeavor established this point beyond doubt that there exists a positive relationship between stressful life events and the precipitation of the psycho-physiological diseases. The stress theory developed by a distinguished Canadian endocrinologist and biomedical researcher, Selye (1956, 1969) and his followers over the last generation (Dohrenwend and Dohrenwend, 1974; Rahe, 1974), that biochemical changes brought on by stress are eventually self damaging, has received wide acceptance. During the last two decades, investigators have shown that the recent life histories of hospitalized persons contain significantly more frequent and stressful life events than do histories of matched controls from the general population (for example, Paykel, 1974). Selye (1976) opined the notion that negative stress (distress) increases the vulnerability of the individual’s psychological and physical health and thus do more damage. There are plenty of evidences to show that the reactions to stress can lead to the development of asthma. A study conducted by Bengtsson (1984) revealed that stressful life events can even trigger an asthmatic attack in an individual already predisposed to develop this disease.

It is thought that emotional, environmental, and other personal stressors cumulatively leave biochemical scars that eventually result in ulcers, hypertension, asthma and other psychophysiological diseases (Gottschalk, 1975). Likewise, Aitken, Zeally and Rosenthal (1969) and, Plutchik et al. (1978) have suggested that emotions and life stress can affect the severity of
asthma symptoms, it can cause certain biochemical changes which in turn result in the development of asthma.

In a study conducted on stressful life events, personality and asthma, Pawar (2003) concluded that negative life events experienced by asthmatics have significant impact on the health of asthma patients. Other studies conducted on stress and asthma suggested that stress can produce bronchoconstriction and between 20 per cent and 40 per cent of subjects with asthma experience exacerbations of symptoms during periods of stress (Isenberg, Lahrer and Hochron, 1992).

Carr, Lehrer, Hochron and Jackson (1996) assessed airway impedance (that is, difficulty/hindrance in breathing) responses to psychological stressors among 113 individuals: 61 with asthma only (AS), 10 with asthma and panic disorder (ASPD), 24 with panic disorder only (PD), and 18 controls with neither condition (CON). They excavated that individuals with either AS or PD were affected by psychological stressors.

In a study conducted by Ritz, Steptoe, DeWilde and Costa (2000), 24 patients with mild to moderate asthma were compared to an equal number of age-matched controls. Both groups were exposed to stress in two ways: they were asked to complete subtraction problems while someone pressure them and they viewed emotionally charged films and slides. The asthma patients responded to stress with greater increase in respiratory resistance (the resistance offered to the passage of air through respiratory tract), blood
pressure etc. than control group experienced; they also reported high levels of depression, arousal, and shortness of breath.

On the basis of their observations, Rietveld, Beest and Everaerd (1999) argued that stress can be sufficient to induce breathlessness in asthmatic patients. Stress was induced by frustrating computer task in 30 adolescents with asthma and 20 normal controls, aged 14 to 19 years, stress measures were self-reported emotions, heart rate and blood pressure. High levels of negative emotions and stress were noticed and confirmed in asthmatic patients.

In a study, Liu and colleagues (2002) posited that the stress of school examination on otherwise apparently healthy young college student with no asthma had severe effect. The data strongly support the contention that stress promoted at least some hallmark of inflammation associated with asthma.

Among children with asthma, but without high level of chronic stress, acute psychological stress or stressful life events significantly had both an early and a late effect, in increasing the risk of new asthma attack on exacerbations. The early/immediate effect occurred in the first day or two after the stress and the late effect at weeks 5 to 7 (Archivist, 2005). Sandberg and colleague (2004) attempted to track the frequency and severity of asthma attacks in school aged children, none of the children in the study were felt to have chronic high stress at the start of the study. For 18 months, separate teams of researchers, who did not have access to the other team’s findings,
independently evaluated the children’s asthma and stressful life events. Children in the study averaged 2 major stressful life events during the study - events such as the death of a pet, a close friend’s family moving away, parent’s divorce or separation, the death of a grand parent, or becoming the victim of a serious bullying incident. The findings showed that these stressors had both immediate and delayed effects on the children’s asthma. Within two days of each stressful event, the risk of having an asthma attack skyrocked up nearly five-fold. After the first 48 hours, there was no increased risk - until 5 to 7 weeks later, when the risk of another attack nearly doubled.

Moreover, psychological distress in children has been associated with asthma that is more difficult to manage (Fritz and Overholser, 1989) with more frequent and lengthier admission to the hospital (Kaptein, 1982); and greater functional disability (Gutstadt et al., 1989). Some patients with asthma experience increased broncho-constriction in response to acutely distressful situations (Lehrer, 1998) (see Forsythe et al., 2004).

Archea et al. (2006) conducted a study on 189 adults with asthma. They analyzed responses to a self-completed questionnaire assessing negative life events and asthma related quality of life. They concluded that negative life events are associated with quality of life among adults with asthma.

Kleeman (1967) interviewed twenty-six patients over an eighteen month period. According to the reports of these patients, 69 per cent of their attacks began with an emotional disturbance.
Several studies that focused on the role of pathogenic family patterns have considered parent-child interactions important in the etiology of asthma. Mother’s of asthmatic patients generally have an ambivalent feeling towards these children. They tend to reject them, while at the same time being overprotective and unduly restrictive of children’s activities (Lipton, Steinschneider and Richmond, 1966; Olds, 1970). In one investigation Mrazek et al. (1991) began with 150 pregnant women who had asthma. Because asthma has a genetic component the investigators intended to study at risk offspring and assess parental characteristics as well. The parents were interviewed three weeks after the birth to determine their attitude towards the infant, their strategy for sharing parenting duties, and the presence of any emotional disturbance. The children were closely monitored over the next two years, and the frequency of asthma were than related to the parental characteristics noted earlier. Among the families who were rated as having problems, 25 per cent of the children developed asthma as compared with only 8 per cent of the children from the other families.

The mothers of asthmatic children have been seen as excessively controlling, and creating an emotionally tense home environment and thus attempting to prevent their children’s growth and independence. This observation has had a very limited kind of verification from the frequent observation that when asthmatic children are removed from their homes, their symptoms almost always improve because this improvement might also be traced to being removed from hidden allergens or other extrinsic triggers.
To evaluate the role of mother, family and the home, Purcell *et al.* (1969) designed a complex experiment in which asthmatic children would stay in their own home, without their parents. Thirteen families in which emotional factors seemed to play a leading role in attack were selected. Another group of families in which children’s attacks did not seem related to emotional circumstances was also chosen. Every family member but the asthmatic children moved out of the home for two weeks and a house-keeper was employed to care for the child. During the separation the asthmatic children for whom emotional factors were low showed no important change in their disease. The children for whom emotional factors were rated high demonstrated remarkable improvement. But when the two week experimental separation was over and the parents returned, the improved children returned to their old pattern.

The parents of the asthmatic child also frequently become anxious and tend to be overprotective towards the child. Occasionally, family disputes or marital problems may be found to be major factors in the etiology of intractable asthma. Because individuals coming out of such family backgrounds tend to be overdependent and insecure, it would hardly be surprising if they should react with chronic emotional mobilization to problems that do not seem threatening to most people. It is likely that such psycho-social factors in a family will make their contribution to the severity of asthma.
Although, these researches suggest that the home life of some asthmatic children may play a role in their disease. Some researchers do not find any difference in the adjustment level and disciplinary practices of the mother's of asthmatic and normal children (Gauthier et al., 1977, 1978; Eiser, Eiser, Town and Tripp, 1991). In such cases asthma which has allergic or infectious causes may just be perpetuated by family attitudes. Parents of these children may unwittingly reward various symptoms of the syndrome by catering to asthmatic children and treating them especially because of the asthma. Their mothers tend to become ambivalent, protective, and restrictive after the asthma appears.

A large body of literature suggests a common personality profile descriptive of asthmatic patients or of a specific type of nuclear conflict, for example, unresolved dependency on the mother, or unconscious fear of the loss of their mother and mothering image. The suggestion that unresolved dependency conflicts are central in the development of asthma is contained in the influential writings of Alexander, Fench and Pollock (1968), they explained how personality traits give rise to particular psychosomatic symptoms by using the concept of regression. According to Alexander et al. (1968), adult emotions stir up childhood organ fixations. A child deprived of sufficient mothering (nursing) during the oral stage fixates his or her need. French and Alexander (1941) hypothesized that asthma may often be viewed as a “suppressed cry”, with the stated implications that asthmatic children cry less than non-asthmatics, particularly around critical periods of separation
conflict. Dynamic theorists have attributed asthma to the relationship between an overly fond mother and clinging child. Most of them can trace their explanations of psychosomatic disorder to Freud (1931), who believed that psychophysiological symptoms were "organ neuroses". The symptoms symbolically expressed the patient's hidden emotional needs. The wheezing or coughing, for example, were seen as a 'repressed cry for help'. The patients wanted to be an infant again and was metamorphically looking for mother.

Many authors have implied that certain personality characteristics bear a causal relationship or the development of the asthmatic symptom; others have noted that they appear secondary, resulting from symptom and its effects on the patient and family. Asthmatics, particularly children are anxious, dependent, conforming, insecure, lacking in self-confidence and hypersensitive. According to Alexander, French and Pollock (1968) and Gottschalk (1975) asthmatics are overdependent, infantile, want to be cared for, have ambivalent feeling towards self and others. Several investigators have found that asthmatic individuals have many neurotic symptoms such as dependency (Herbert, 1965), meekness, sensitivity, anxiety, meticulousness, perfectionism and obsessions (Rees, 1964).

First, Neuhaus (1958) compared the personality test scores of asthmatic children with those of a group of normal children and a group of children with cardiac conditions, and found that both asthmatic and cardiac patients (children) were significantly more maladjusted (anxious, insecure,
and dependent) than a normal control group. While the asthmatics were found to be more neurotic than the other two groups.

In a recent study, Pawar (2003) studied specific personality patterns of asthmatics and observed that the asthmatic patients scored high on such personality variables viz. as irrationality, locus of control, repression-sensitization and anxiety. Asthmatics possessed more field-dependent style of personality as compared to the normals.

To conclude, attempts to study particular constellation of personality traits linked to asthma as yet gave results that are inconclusive.

Asthmatics are also at an increased risk for affective commorbiditity specifically anxiety, depression and panic disorder. Considerable evidence exists that asthma symptoms continue well into adolescence and early adulthood for 90 per cent of patients (Kelly, Hudson, Phelan, Pain and Olinsky, 1987). Therefore, asthmatic patients usually experience psychological sequela (Beuder and Klinnert, 1998; Creer, Harm and Marion, 1988; Lehrer, Isenberg and Hochron, 1993; Silverglade, Tosi, Wise, and D’Costa, 1994), including anxiety, mood and behavioural disorders, and poor self-esteem and social competence (Vila, Nollet-Clemencon, Vera, et al., 1999). Several researches evidence that asthma and these psychological states and traits may mutually potentiate each other through asthma triggers and inaccuracy of asthma symptom perception etc.
Jones, Wagener, Lando and Feldman (1999) conducted a study to examine the association of symptoms of anxiety and depression with increased risk of developing asthma. The association between asthma incidence and anxiety and depression were tested among 5,231 baseline nonasthmatics (aged 25-74 years) using C. Cox proportional hazards regression. A clear risk gradient was observed for both anxiety and depression symptomatology. The effects of anxiety and depression were particularly strong among nonsmokers without respiratory symptoms.

Bussing, Burket and Kelleher (1996) compared 37 asthmatic children with 31 matched healthy controls for DSM-III-R anxiety disorders and observed that the asthma group had significantly more total anxiety disorders, past school problems, past psychiatric illness, and intrafamilial stress, and there was also more family history of emotional problems.

Nascimento et al. (2002) evaluated the frequency of anxiety disorders in 86 asthmatic outpatients (aged 13-80 years). Psychiatric diagnosis were assessed with the Mini-International Neuropsychiatric Interview 4.4 version. 45 asthmatic patients reported at least one current anxiety disorder. The frequency of panic disorder with or without agoraphobia was 13.9% and that of agoraphobia without panic disorder was 26.8%. Social anxiety and generalized anxiety disorders occurred in 9.3% and 24.4% of the sample, respectively. 29 patients reported a major depressive episode. The psychiatric morbidity of the sample was 61.6%. The results supported the high morbidity
of anxiety disorders, particularly panic/agoraphobic spectrum disorders, in asthmatic outpatients.

Carr (1998, 1999) opined that the presence of asthma is a risk factor for the development of panic disorder. The occurrence of panic disorder in asthma was greater than would be expected based on their individual prevalence rates. This may be due in part to the important role of respiratory factors in panic disorder. Panic and anxiety can directly exacerbate asthma symptoms through hyperventilation.

Gillaspy et al. (2002) revealed that adolescents with asthma experienced higher levels of anxiety, depression and global psychological distress than normals. Asthmatic adolescents, already at risk for adjustment problems, with secondary to lower economic strata and educational or vocational failure, may be more likely to experience psychological distress than normals.

Silverglade, Tosi, Wise and D’Costa (1994) studied 129 asthmatic adolescents (aged 12-18 years) and a group of 74 healthy, non-asthmatic adolescents. Differences in selective (irrational beliefs) and emotional (anxiety, depression and hostility) characteristics were examined. Multivariate analysis indicated that irrational beliefs in the importance of approval and the lack of control of emotions, along with self-reported anxiety, depression, or hostility, were strongly associated with asthma severity.
Wamboldt *et al.* (1998) carried out a study in which subjects were 337 children (aged 7-19 years). Children's asthma severity was rated by experienced paediatric asthma specialists. Children filled out the Children's Manifest Anxiety scale and the Weinberger Adjustment Inventory. Child rated anxiety symptoms were unrelated to asthma severity or to markers of asthma functional morbidity. Results revealed that children with severe asthma did not rate themselves as having higher level of anxiety than those with mild or moderate asthma or than standardized norms.

Hommel *et al.* (2003) tested the differential condition of illness uncertainty of self-reported anxiety and depression in the sample of 56 adolescents (aged 18-21 years) with childhood-onset asthma. Measures of illness uncertainty, anxiety and depression were completed by the subjects and objective assessments of illness severity were obtained with the help of semi-structured interview and pulmonary function test. Results revealed that illness uncertainty contributed significant variance to anxiety after statistically controlling the effects of demographic and disease parameters and depressive symptomatology; illness uncertainty did not contribute significant variance to depression. Earlier, results obtained by Hommel *et al.* (2002) indicated that the combination of anxiety and depression severity contributed significant variance to asthma quality of life after statistically controlling demographic and disease covariates. Moreover, anxiety demonstrated a significant main effect on asthma quality of life.
Ten Thoren and Petermann (2000) argued that the main characteristic of asthma is sudden and unexpected attacks of impaired breathing. Both the attacks themselves and the prospect of attacks generate much anxiety amongst patients. Several different forms of anxiety can be identified which vary in intensity and the situations in which they appear. Anxiety disorders are more common in asthmatics and have a considerable influence on asthma management because they influence symptom perception. Excessive anxiety about asthma symptoms can affect the patient’s response to an attack; anxiety related to asthma triggers can reduce the patient’s quality of life and anxiety related to medical treatment can influence compliance.

Deshmukh, Toelle, Usherwood, O’Grady and Jankins (2007) reviewed researches concerning asthma and anxiety disorders. They suggested the increased probability of the prevalence of anxiety disorders, and particularly panic disorder and panic attacks in patients with asthma, as compared to a normal population. Research also indicates significant levels of co-morbidity between asthma and anxiety as measured on dimensional scales of anxiety and panic. Clinical anxiety and panic manifestations affect symptom perception and asthma management through the effects of anxiety symptoms such as hyperventilation, and indirectly through self-management behaviour and physician response.

Krommydas and others (2004) examined the relation between depression, anxiety and pulmonary function in asthmatics. Thirty eight adult asthmatic patients underwent psychometric evaluation with DSSI/sAD
questionnaire, filled in asthma questionnaire and underwent spirometry. The majority of patients suffered from mild-persistent asthma. Twenty-six reported symptoms of anxiety and 25 reported symptoms of depression. These findings indicate a high frequency of depression and anxiety in adult asthma patients.

Phillipp and his associates (1972) demonstrated that the expectancy of asthmatic attack is an important factor in this respiratory disorder. He compared the reactions to bronchospasmatic and neutral substances of a group of allergic asthmatics (based on skin test reactivity) to a group of non-allergic asthmatics. The findings, based on measures of breathing capacity were that the non-allergic group had more asthmatic attacks than the allergic group in response to both the bronchospasm-inducing and the neutral inhalants. The investigators interpreted these results as indicating that the psychogenic group's greater fear or expectancy of asthmatic attacks were responsible for the differences. They also learned that the non-allergic or psychogenic group also benefited more from relaxation training than the allergic group, suggesting again that fear of attack may be important in triggering the asthma attack itself.

Specific emotional states particularly negative affectivity in relation to asthma has also been extensively studied by many investigator. Miller and Wood (1997) studied twenty four children aged 8-17 years with moderate to severe asthma. The subjects viewed the movie E.T., the Extra-Terrestrial while having their heart and respiration rate and oxygen saturation
continuously recorded. Specific scenes were identified and preselected to evoke sadness, happiness, and a mixture of happiness and sadness. Self-report of emotion and indices of physiological response were analyzed for these targeted scenes. Results indicated that sadness was associated with greater heart rate variability and instability of oxygen saturation compared with happiness, with mixed result for happiness and sadness. They concluded that results support sadness as evoking patterns of autonomic influence consistent with cholinergically mediated airway constriction. Happiness appears to effect autonomic patterns that would tend to relieve airway constriction.

Opolski and Wilson (2005) carried out a review of the researches conducted on depression and asthma. The main findings from this review included that sadness and depression can produce respiratory effects consistent with asthma exacerbations.

Put and others (2004) investigated the effect of suggestion on subjective and objective asthma symptoms as a function of negative affectivity. Findings showed that asthmatics (N=32) with high negative affectivity and overall more intense asthma symptoms. They also reported more airway obstruction after suggested bronchoconstriction and less after suggested bronchodilation, whereas person with low negative affectivity did not show such variation. These effects were unrelated to social desirability. They concluded that self-reported symptoms of asthmatics with high negative affectivity are more influenced by suggestion than those of patients with low negative affectivity.
Smith and Nicholson (2001) conducted a longitudinal study of 92 asthmatic adults to investigate the role of psychosocial factors in exacerbations of asthma in adults induced by upper respiratory tract infections (URTIs). The results showed that those who experienced at least one episode reported more negative life events, high negative affectivity and low social support.

Put, Demedts, Van Den Berge, Demyttenaere and Verleden (1999) carried out an empirical study on 116 asthmatic patients and hypothesized that the symptom reporting in asthmatics does not necessarily correspond to clinical status, but may be directly or indirectly mediated by personality, such as negative affectivity.

Priel, Heimer, Robinowitz and Hendler (1994) studied the role of negative affectivity on patients’ perceptions of behaviour during asthma attacks among 47 asthma subjects. Patients completed 17 to 30 daily questionnaires assessing negative affect, asthma perception, additional drug intake, search for medical assistance, and peak-flow measures of respiratory distress. Asthma perceptions were correlated with negative affect and educational level; the perception of the asthma severity, but not negative affect, did predict behaviour during an attack.

Attributional theories have been used as a framework for understanding diverse issues and topics, most intriguing of which are the problems of health—physical as well as psychological. An emerging body of
literature has addressed the relationship between attributional style and various health-related functioning supporting the contention that the way people attribute the causes of negative and positive events/situations has an important link with the physical and psychological well-being of the individuals.

Since the attributional theory emerged out of the learned helplessness model of depression its role in depression is well documented.

Sweeney, Anderson and Bailey (1986) reported that for negative events, attributions to internal, stable, and global causes had reliable and significant association with depression. The relation between attribution factors of ability and luck was also significant but it was stronger for negative events.

Greenberg, Pyszczynski, Burling and Tibbs (1992) examined whether depressive self focusing style account for the lack of self serving attributional bias in depressed person. They found that conditions analogous to non depressed patterns of attributional focus led to self serving attributional bias for all subjects.

Dixon and Ahrens (1992) carried out a longitudinal study to assess the ability to interaction of attributional style and daily negative events to predict self reported depression in 84 children. The self reported depression symptoms were assessed before and after exposure to stressful event. It was found that attributional style did not predict change in self reported depression
symptoms following stressful events, the interaction of attributional style with stress did predict them. Stress predicted depression symptoms as well.

Hanger and Lund (2002) investigated how self-concept and attributational style are related to depression. On the basis of an inventory, 166 teacher students (mean age 25.3 years) were scored on general and academic self-esteem, attribution for positive and negative events and depression. The two self-esteem variables were found to constitute important predictors of depression, while the contributions of the attributational variables were of minor importance. In addition, pessimistic attributions to both positive and negative events resulted in higher depression than pessimistic attributions to either kind of events, and to neither kind of events. Finally, factor analysis resulted in interpretable solutions.

Studies focusing efforts to explore relationship between attributational style and anxiety yield conflicting results.

Kenardy, Evans and Oei (1990) investigated the relationship between the development of panic disorder and attributational style by administering the Attributional Style Questionnaire (ASQ) to 28 subjects with panic disorder with agoraphobia and 21 subjects with other anxiety disorders who had experienced a panic attack at some time. No significant differences were found between the groups suggesting that cognitive style as assessed by the ASQ may not predispose to the development of panic disorder. However, evidences from a variety of sources suggest that early experience with
diminished control may foster a cognitive style characterized by an increased probability of interpreting or processing subsequent events as out of one’s control, which may represent a psychological vulnerability for anxiety (Chorpita and Barlow, 1998).

Ahrens and Haaga (1993) conducted a study in which 94 undergraduate students completed measures of trait positive and negative affectivity, anxiety, depression, optimism, hopelessness, and attributional style (ATS). After writing about negative events or hearing a tape describing a positive academic experience, subjects completed measures of state positive and negative affect and self-efficacy expectancies. Positive affectivity was associated with ATS for positive, but not negative, events. Negative affectivity was associated with ATS for negative, but not for positive, events. Negative event ATS was specifically associated with anxiety expectancies and positive event ATS was associated with depression. ATS predicted state positive affect following the positive tape. Effects of ATS on affect were partially independent of expectations.

Bell-Dolan and Wessler (1994) postulated that, although the role of causal attributions in children’s anxiety is important from theoretical and practical standpoints, knowledge of anxious children’s attributions and incorporation of knowledge into specific treatments is quite limited. Attributional style is included in several theories of anxiety, with particular reference to external locus of control and stable attributions for negative situations. Adult literature support a relationship between anxiety and
negative attributional style, with negative attributions most strongly related to social anxiety. Additionally, the stability dimension seems most consistently related to anxiety. Although the child literature is less developed, it suggests that similar relationships may hold for child anxiety and attributional style.

Lynd-Stevenson and Rigano (1996) proposed that research by Ahrens and Haaga failed to support the prediction the expectancy mediates the relationship between attributional style for negative outcomes and anxiety because the measure of expectancy failed to evaluate the type of expectations directly involved in the etiology of anxiety (i.e., threat expectancy). 104 college students (aged 18-48 years) were interviewed, and their scores on measures of attributional style for positive and negative outcomes, threat expectancy regarding the prospect of future unemployments, and anxiety about future unemployment (unemployment anxiety) were obtained. Findings support the prediction that threat expectancy mediates the relationship between attributional style for negative outcomes and unemployment anxiety. There was also evidence consistent with the tripartite model of anxiety and depression that attributional style for positive outcome is unrelated to the cognitive processes that generate anxiety.

Luten, Ralph and Mineka (1997) carried out two studies with college students and explored the relationship of a pessimistic attributional style to positive and negative affect, as well as to depressed and anxious mood. Both studies revealed that a pessimistic attributional style was correlated with negative affect and depressed mood, but was unrelated to low levels of
positive affect. The second study also showed a correlation with anxiety, and that the association of pessimistic attributional style with emotional distress occurs for both depression-relevant (that is, loss/failure) as well as anxiety-relevant (that is, threatening) events. Results supported the hypothesis that pessimistic attributional style is a nonspecific diathesis for symptoms of both anxiety and depression.

Swendson (1997) applied the experience sampling method to test the helplessness-hopelessness theory of relationship between patterns of anxiety and depression (L.B. Alloy et al., 1990) in 44 undergraduates (mean age 19 years). 22 subjects categorized as having low depression and anxiety and "low risk" attributional style provided 5 daily self-reports of negative events, attributions, and anxious and depressed mood immediately after negative events. Attributional style predicted these causal attributions, but did not directly explain changes in post event depressed mood. Despite support for more established components of the theory, no support was found for newer aspects concerning the relationships of control attributions to anxious mood.

Rodrignez and Pehi (1998) examined the pattern of relationships among attributional style, depression, and anxiety in a sample of 69 New Zealand Children (aged 8-14 years), and evaluated the specificity of maladaptive attributional cognition to depression. Subjects responded to 3 self-report measures: the Children Depression Inventory, the Children's Manifest Anxiety Scale-Revised and Children's Attributional Style Questionnaire. Both depression and anxiety scores were significantly
correlated with attributional style. However, multiple regression analysis revealed that depression but not anxiety significantly predicted overall attributional style. Thus anxiety was no longer significantly correlated with maladaptive explanatory style upon controlling for depression.

Waschbusch, Sellers, LeBlanc and Kelley (2003) evaluated whether anxiety influences the relationship between helpless attributions and depression. Results showed that male adolescents with anxiety only had helpless attributions style that were similar to male adolescents with depression, but the same was not true for female adolescents. Results also suggest that helpless attributions may be related to both anxiety and depression in males.

An extensive body of literature has addressed the relationship between attributional style and physical or psychological health.

In Virginia Polytechnic study, Peterson (1988) found that individuals who believed that stable plus global factors caused bad events, experienced more days of illness in a month and visited physicians more frequently in a year. They also reported more unhealthy habits, lower efficacy to change the habits, and more stressful occurrences than subjects who experienced bad events with unstable plus specific causes. Optimistic individuals who explain bad events with external, unstable and, specific causes experience better health than the pessimists, who explain bad events with internal, stable and global causes (Peterson, 1995).
Dua (1994) determined the comparative predictive value of attributional style in predicting self-reported physical and psychological health. He observed that global attributions for bad events were better predictor of health than those for good events.

Pessimistic explanatory style is a risk factor for illness, but the factor linking explanatory style and illness are unknown. One's characteristic response to poor health may mediate this relationship. Perhaps pessimistic individuals act helplessly in the face of their symptoms, thereby exacerbating disease. In a study, Lin and Peterson (1990) investigated this possibility and observed that subjects who explained bad events pessimistically (with internal, stable, and global causes) reported more frequent illness during the past year and rated their overall health more poorly than those who habitually favour external, unstable and specific explanations. When ill, pessimistic subjects were less likely than their optimistic counterparts to take active steps to combat their illness. Results suggested that one pathway leading from pessimistic explanatory style to poor health is mundane: passivity in the face of disease.

A study of Harvard University graduate assessing pessimistic explanatory style at age 25 found that these men had significantly poorer health or were more likely to have died when they were assessed 20 to 35 years later. Explanatory style was extracted from open-ended questionnaires filled out by 99 graduates of the Harvard University classes of 1942-1944 at age 25. Physical health from ages 30 to 60 as measured by physician
examination was related to earlier explanatory style. Pessimistic explanatory style predicted poor health at ages 45 through 60, even when physical and mental health at age 25 was controlled. Pessimism in early adulthood appears to be a risk factor from poor health in middle and late adulthood (Peterson, Seligman and Vaillant, 1988).

Metalsky et al. (1997) examined whether the negative attributional style featured in helplessness/hopelessness theory would moderate the exhibition of depressive symptoms in 22 bulimic females as compared with 14 depressed patients. Results indicated that clinically bulimic subjects with a negative attributional style exhibited depressed symptoms whereas clinical bulimics without a negative attributional style did not. Bulimic subjects with a negative attributinal style feel severe range of symptom severity as opposed to bulimic subjects with negative style who feel in normal range of severity. Additionally, attributional style moderate severity of depressed symptoms as much in bulimic as in depressed subjects.

Goebel, Spalthoff, Schulze and Florin (1989) studied a group of 44 bulimic women as well as 38 women with no indication of eating disorder, compared with respect to age, weight and height, and observed that bulimics showed significantly higher ASQ (bad negative events) scores. The findings provide first evidence that dysfunctional attributes and depressive attributional style are predominant in bulimic women but at the same time are not necessarily predictive of the severity of the disease.
Tamara, Waller and Rachel (2006) examined attributional style in the eating disorders for positive and negative events, independent of covariant effects of depression. Twenty-five eating-disordered women and 26 nonclinical women each completed measures of attributonal style, depressed mood, and eating pathology. They also completed a measure of verbal intelligence (to ensure comparability of groups). Women with an eating disorder had a greater tendency to attribute negative situations to the self when compared with nonclinical women, even when differences in depressed mood were controlled for. There were no comparable differences in positive attributional biases. Women with an eating disorder adopted a self-blaming style when evaluating negative events, and such self-blame was contributed to the maintenance of an eating disorder.

The attributional reformulation of helplessness theory predicts that stress coupled with a pessimistic explanatory style leads to negative outcomes, including physical illness, among at risk individuals. The longitudinal study of 198 college students examined whether pessimistic explanatory style interacts with perceived stress to predict subsequent illness, even when controlling for baseline illness. Results confirmed this hypothesis (Jackson, Sellers, and Peterson, 2002).

Uomoto and Fann (2004) have examined the perception of injury and explanatory style in symptomatic mild traumatic brain injury (MTBI). Participants were 22 adults with MTBI and 11 with moderate/severe traumatic brain injury (TBI). Results revealed that MTBI patients reported greater
injury severity and poorer cognitive recovery and rated their brain injury as affecting more areas of life than the moderate/severe TBI group. Pessimistic explanatory style was associated with poorer perceived recovery.

In Recurrent Coronary Prevention Pessimism study, Buchanan (1995) found that pessimism predicted death from coronary events over a period of $8\frac{1}{2}$ years.

Hommel, Wagner, Chaney & Mullins (2001) examined the prospective contribution of attributional style in rheumatoid arthritis. 42 patients were followed over the course of 1 year and completed various measures at time 1 and time 2. Results revealed that a pessimistic attributional style at Time 1 significantly predicted lower self-rated disability at Time 2. Chaney et al. (2004) examined longitudinal relationships between causal attributions and depression symptoms in adults with rheumatoid arthritis. Cross-lagged penal correlations tested the temporal precedence of attributions relative to depression symptoms over 1 year. 42 participants completed self-report instruments on 21 occasions. Results showed that Time 1 attributions predicted increased levels of depression symptoms at Time 2 after perceived pain and disability were controlled; Time 1 depression symptoms were unrelated to Time 2 attributions. Cross-lagged correlation comparisons revealed statistical dominance for attribution-depression relationships relative to depression attribution relationships.

Love (1988) studied the attributional styles of depressed and non-depressed chronic low back pain patients ($N=91$) in order to test the Revised
Learned Helplessness model's prediction of differences between the two. The results partly supported the hypothesis; an internal, stable, global style for negative events distinguished the depressed group from the non-depressed, but there were no differences in attributional style for positive events.

Buckelew and his colleagues (1990) studied locus of control beliefs among 160 subjects (67 males and 93 females) referred to a comprehensive pain rehabilitation program, and found that the younger male patients reported a strong internal attributional style. Older male patients relied more heavily on both chance and powerful other factors. Among women, cluster assignment was related to the use of coping strategies. It appears that the presence of both Internal and Powerful other health attributional styles is associated with less frequent use of cognitive self-management techniques.

In a study McGuigan (1995) examined the attributional style and depression in men receiving treatment for chronic back pain. 122 subjects (aged 22-55 years) completed the Attributional Style Questionnaire and the Beck Depression Inventory. Finding showed that there was no significant correlation between depression and negative attributional style among back pain patients.

Schoenherr, Brown, Baldwin and Kaslow (1992) focused on attributional style by examining 96 youth (aged 7 years to 16 years 11 months) diagnosed with insulin-dependent diabetes mellitus (IDDM), acute lymphocytic leukemia, or sickle-cell syndromes (SCSs). Disease/disability
parameters, including duration of diseases and age of disease onset, were examined to determine their relation to attributional style. Attributional style was an efficient predictor of youth’s self-reports of depressive symptoms, when controlling for demographic and disease-reports of depressive symptoms.

Cheng and Furnhaum (2001, 2003) examined to what extent attributional style (internal, stable, and global) predicts positive affect, self-reported happiness, mental health or psychological well-being in college students. Regression analysis showed that the Attributional Style Questionnaire was the significant predictor of happiness and mental health. Results indicated that optimistic attributional style in positive situations was a stronger predictor of self-reported happiness than mental health and pessimistic attributional style in negative situations was a predictor of both happiness and mental health.

Khan and Jahan (2006) in a study found that persons experiencing high sense of well-being differed from those experiencing low sense of well-being on attributional style. Persons having high sense of well-being had more internal attributions for the positive events and, more unstable and specific attributions for the negative events. On the other hand, the attribution of the persons having low sense of well-being were found more external for positive events and, more stable and global for negative events.
Few studies have reported gender differences in the role of attributional style. Previously, Rim (1990) suggested that men and women differ in the coping styles related to attribution. The coping styles most related to attribution in men were suppression, replacement and reversal and in women, the coping styles were blame seeking, succorance, replacement and reversal.

Rim (1991) investigated the relationship between neuroticism and extraversion and three attributional styles: internality stability and globality, for good and bad events. Results showed that women scoring low on neuroticism have significantly higher scores on good events than on bad events on all three attributional styles. Men scoring low on neuroticism attributed good events to more stable factors, whereas those scoring high on neuroticism attributed good events to more global factors. With regard to extraversion, low scoring men and women scored higher on good than on bad events on internality, and whether high or low on extraversion – men and women scored higher on good than on bad events for stability.

Bunce and Peterson (1997) investigated the links between explanatory style and established personality variables as measured by the California Psychological Inventory (CPI). Correlations with a pessimistic explanatory style were heavily concentrated among the class I variables of CPI for men, where as women’s pessimistic explanatory style was linked with well-being and good impression. Two major scales (sociability and socialization) showed significant sex differences with respect to their
correlation with explanatory style for negative events. The differential pattern of correlations suggests that explanatory style may be relevant to different personality domains for males and females.

Gladstone, Kaslow, Seeley and Lewinson (1997) examined attributional style, sex and depressive symptoms and diagnosis in high school students. The results revealed that (1) for females and males, higher levels of depressive symptoms correlated with a more depressive attributional style; (2) females and males who met diagnostic criteria for a current depressive disorder evidenced more depressogenic attributions than psychiatric controls, and never and past depressed adolescents; (3) although no sex difference in terms of attribution pattern for positive events, negative events, or for positive and negative events combined emerged, sex differences were revealed on a number of dimensional scores; (4) across the Children’s Attribution Style Questionnaire (CASQ) subscale and dimensional scores, the relation between attribution and current self reported depressive symptoms was stronger for females than males; and (5) no sex X Diagnostic Group status interaction effects emerged for CASQ subscale or dimensional scores.

Poropat (2002) suggested that attributonal style is one of the cognitive-affective system and has been shown to be related to a number of different patterns for men and women. His study examined the relationship between attributional style as assessed by the Attributional Style Questionnaire, gender, and the FFM (five factor model) Mini-Markers, using a sample of students (aged 17-53 years). The patterns of correlations between
attributional Style Questionnaire and FFM dimensions appeared different for men and women, and 3 significant gender interactions were observed using multiple regression. Both internal attributional style for positive events and overall attributional style interacted with gender to predict openness and hopefulness interacted with gender to predict extraversion.

**ANXIETY SENSITIVITY**

Accumulated research evidences suggest that anxiety sensitivity is a risk factor for anxiety pathology and plays a prominent role in the maintenance and genesis of the anxiety disorder in general and panic disorder in particular (for example, Barlow, 1991; McNally, 1990; Reiss, 1991). According to this theorizing, the elevated anxiety and/or physiological arousal that all of us are prone to during stressful times become stimuli capable of triggering a vicious cycle of ever-heightening anxiety and even panic for people high in anxiety sensitivity (Zinbarg et al., 2001). Jensen’s study (as cited in Joiner et al., 2002) illustrated that children who scored significantly higher on the Childhood Anxiety Sensitivity Index are more often diagnosed as having anxiety disorders.

In a four year longitudinal investigation using high school students, Weems, Hayward, Killen and Taylor (2002) found high anxiety sensitivity group reporting the experience of panic attacks as compared to low anxiety sensitivity group. Comparable findings were obtained by Lau, Calamari and Waraczynski (1996). They observed significant correlations between the
scores of Panic Attack Questionnaire and Childhood Anxiety Sensitivity Index.

The role of anxiety sensitivity in pain disorders is also well documented. Asmundson and Norton (1995) investigated pain reports in a group of chronic back pain patients (N=70, age range = 17-58 years) that were classified as high, medium, or low in anxiety sensitivity. Although no difference were found in the intensity of experienced pain, those high in anxiety sensitivity reported greater fear of negative consequences of pain, and also greater cognitive disruption and anxiety in response to pain than low-anxious individuals. This suggests that those high in anxiety sensitivity tend to report a greater fear of pain sensations, irrespective of reported pain intensity.

Keogh and Birkby (1999) reported that anxiety sensitivity may play a role in mediating negative experience and sensations, associated with pain. Measure of pain threshold and tolerance were taken, as were self-reported measure of affective and sensory experiences. Because differences between males and females have been found with both anxiety sensitivity and pain experience, gender differences were also investigated. As expected, gender was found to mediate the association of anxiety sensitivity and sensory pain. While, high anxiety sensitive females reported greater pain than low anxiety sensitive females, no effect of anxiety sensitivity on sensory pain was found among males.
Keogh and Cochrane (2002) conducted a study to determine the mechanism by which the relationship between anxiety sensitivity and pain experience exists. Selective attentional and interpretative biases for negative material were compared as potential mediator of the anxiety sensitivity-pain relationship. With the cold pressure task, the study found that high anxiety sensitive participants exhibited a greater interpretative bias and reported more negative pain experiences than those low in anxiety sensitivity. A negative interpretative bias was also related to higher affective pain experiences. However, most important was the tendency to interpret innocuous bodily sensations related to pain that mediated the association between anxiety sensitivity and affective pain experiences. These findings not only confirm that anxiety sensitivity plays an important role in the perception of experimental pain but also identify a potential cognitive mechanism by which the relationship exists.

Keogh, Hamid, Hamid and Ellery (2004) investigated the effect of anxiety sensitivity, gender, and negative interpreting bias on the perception of chest pain and suggested that anxiety sensitivity may be an important component in the negative response to pain sensations, especially those with cardiopulmonary origin. Furthermore, they suggested that such effects may be stronger in women than men. The primary aim of this investigation was to determine the relative roles that anxiety sensitivity and gender have in the pain reports of patients referred to a hospital clinic with chest pain. A total of 78 females and 76 male adults were recruited on entry to a Rapid Access
Medical Clinic. All patients had been referred with chest pain; and were administered a range of pain and anxiety measures prior to diagnosis. This investigation confirmed that both anxiety sensitivity and gender were important factors in the experience of pain. This study not only provides an explanation of how anxiety sensitivity is related to pain, but also for whom. Negative interpretative biases were found to mediate the association between anxiety sensitivity and pain in women, but not men, indicated the existence of a gender-specific cognitive mechanism, which may be an important determinant of pain experience. These results not only confirm that anxiety sensitivity is related to greater negative pain responses in women, but that this may be due to increased tendency to negatively interpret sensations.

Interestingly, anxiety sensitivity is not only related with pain experience but also associated with pain-related coping behaviours. Asmundson and Taylor (1996) investigated the role of anxiety sensitivity in pain fear and avoidance in a group of 259 patients with chronic back pain. Through structural equation modeling, they not only found that anxiety sensitivity significantly contributed to the fear of pain, but that it might in turn lead to increased pain avoidance behaviours. In other words, anxiety sensitivity exacerbated the fear of pain, which in turn was found to lead to avoidance behaviours, that is, negative coping strategy. This suggests that anxiety sensitivity may mediate both the perception of pain and the way in which pain is dealt with.
Norman and Lang (2005) explored the role of anxiety sensitivity on functioning in the chronically physically ill. Participants were 267 primary care patients. Logistic regression showed that physical anxiety sensitivity (but not social or psychological), controlling for age, gender, and negative affect, was associated with hypertension, been disease, and high cholesterol (p < .01). Higher anxiety sensitivity was associated with poor vitality, mental functioning, and social functioning (p < .05). They also predicted that anxiety sensitivity may be correlate of poorer adjustment to chronic illness.

Cognitive variables as assessed by Anxiety Sensitivity Index (ASI) and Agoraphobic Cognition Questionnaire (ACQ) were significantly related to illness-specific panic fear (that is, panic fear in response to symptoms of asthma) among asthmatics. In a study conducted in 1995 on 86 asthmatics Carr, Lehrer and Hochron concluded that cognitive variables predicted significant variances in both panic-fear scales (illness-specific and generalized panic fear) after controlling for the effects of demographic and asthma variables. By contrast, the asthma variables were not associated with generalized panic-fear when the cognitive measures were controlled.

In an earlier study, Carr, Lehrer, Rausch and Hochron (1994) proved the relationship among anxiety sensitivity, frequent spontaneous panic attacks and pulmonary function is 93 asthmatic adults. 22.6% of the asthmatics reported a history of spontaneous panic attacks with 9.7% reporting attacks that were severe and frequent enough to meet the DSM-III-R criteria for panic disorder. Anxiety sensitivity but not pulmonary function was significantly
related to panic disorder. In this study, asthmatics (with or without panic disorder) were compared with 10 panic disorder patients without asthma and with 32 nonanxious, nonasthmatic controls on the Anxiety Sensitivity Index (ASI), the Bodily Sensation Questionnaire, and Agoraphobic Cognitions Questionnaire. Whereas subjects with panic disorder (asthmatic and nonasthmatic) displayed significant elevations on these measures, the presence of asthma alone had no effect.

In a study Delvaux, Fontaine and Bartsch (1999), with 66 subjects, showed that anxiety sensitivity correctly discriminates the subjects with panic disorder, who hyperventilate after a stress (mental imagery), subjects who hyperventilate but have no panic disorder, and healthy control subjects. The results were compared with those of a study including asthmatics who experienced hyperventilation before or during their bronchoconstriction. The results showed that asthma didn't arise anxiety sensitivity compared to subjects with hyperventilation only. Subjects prone to hyperventilation who present a panic disorder showed the highest level of anxiety sensitivity.

Perhaps more remarkable, however, is that females report high levels of anxiety sensitivity than males (for example, Peterson and Phehm, 1999; Peterson and Reiss, 1992, Stewart, Taylor and Baker, 1997). Nevertheless, sex differences on the levels of anxiety sensitivity have also been observed with respect to the reporting of the experience of pain. Anxiety sensitivity was related to pain in women but not men (for example, Keogh and Birkby, 1999; Keogh, Hamid, Hamid and Ellergy, 2004).
The above review reveals that though attributional style and anxiety sensitivity have been explored in relation to various disorders, no effort yet has been made to find the role of these variables among asthmatics. Asthma is an intermittent, unpredictable and uncontrollable disease. There are numerous body sensations (for example, wheezing, shortness of breath etc.) that asthmatics must negotiate, including the variable functional limitations and decreased ability to engage in normal daily activities. The feelings of helplessness and lack of control over the situations, which may ultimately alter the availability of certain cognitive and physiological resources, predict increased levels of anxiety and depression in this population. Furthermore, due to increased unpredictability of disease exacerbations, individuals with asthma must attend vigilantly to internal cues (for example, tightness in one’s chest), which may lead to increased anxious behaviour related to their illness (Carr, 1999; Celano and Geller, 1993). Though biological susceptibility is at the root cause of asthma, but precipitation and exacerbation of asthmatic symptoms have links to psychological factors. On the one hand, asthma has been found to be linked to stress, personality factors and pathogenic family interactions, and on the other hand, it has comorbidity with depression, negative affectivity, anxiety and other anxiety disorders particularly agoraphobia and panic attacks. Also not all biologically susceptible individuals develop asthma. It is therefore pertinent to explore the psychological factors related to asthma.