DISCUSSION

The aim of the present investigation was to study the relationship of Weight Status and Health Habits in adolescents with various Personality Dimensions; Stress and Ways of Coping; Positive Mental States (viz. Mental Health, Generalized Self Efficacy, Health Efficacy, Satisfaction with Life, Optimism, Positive Affect and Perceived Happiness Status); Negative Mental States (viz. Anger Experienced and Anger Expressed, Adolescent Depression and Negative Affect); Symptoms of Depression, Hostility and Anxiety; Family-Adolescent Conflict and Perceived Parental Bonding; Health Protective Behavior and Perceived Health Status. The relationship between Adolescents' BMI and Health Habits and Sibling's and Parental BMI and Health Habits was also studied.

To assess the **Weight Status** of adolescents, the measure of Body Mass Index (BMI), also known as the Quetelet Index, for the man who first proposed it over 100 years ago was used. The Body Mass Index is the ratio of weight divided by the height squared (in metric units):

\[
BMI = \frac{\text{Weight in kilograms}}{(\text{Height in Meters})^2}
\]

Health Habits Inventory by Atwater was used to measure different **Health Habits** viz., Eating Habits, Exercise and Fitness Habits and Avoiding of Alcohol and Drug use. Measures of **Health Protective Behavior** and **Perceived Health Status** were also used.

Different **Personality** dimensions included in the investigation were Eysenckian Personality Dimensions, State and Trait Anxiety and Health Locus of Control.

**Stress** measures included were Stress Symptoms, Life Event Stress and Daily Hassles and Uplifts. Measures also included tests of
Coping Styles.

Measures of State and Trait Anger and Anger Expression Styles were also obtained. Negative Affect, Adolescent Depression and Positive Mental States viz., Mental Health, Generalized Self Efficacy, Health Efficacy, Optimism, Satisfaction with Life, Positive Affect and Perceived Happiness Status were also assessed.

Brief symptoms of Depression, Hostility and Anxiety were also included. Measures also included Parental Bonding with their children and Family-Adolescent Conflict.

The sample comprised of 242 adolescents (121 male adolescents and 121 female adolescents) in the age range of 16 to 18 years selected from different private schools in Manipur. In addition to these subjects, their parents and siblings were also included in the sample i.e. 242 mothers, 242 fathers and 242 siblings. So the total sample including their parents and siblings were 968.

The raw scores consisted of scores on all the above mentioned variables. In all 46 variables were studied among Male Adolescents, Female adolescents and the Total Sample.

Out of the 46 variables, only 27 variables were studied among the siblings sample i.e., brothers and sisters of Male and Female Adolescents. They were compared on Weight Status; Health Habits; Eysenckian Personality Dimensions; Positive Mental States viz., Mental Health, Satisfaction with Life, Positive Affect and Perceived Happiness Status; Negative Affect measures viz., Anger Experienced and Anger Expressed and Adolescent - Depression; and Family-Adolescent Conflict.

A set of 17 variables were studied among the parents of Male and Female Adolescents i.e. mothers and fathers of Male and Female Adolescents. The parental scores on Weight Status, Health Habits, Perceived Health Status, various Personality Dimensions, Perceived
Happiness Status and Anger Experienced and Anger Expressed were related with scores of their offspring.

The raw scores were analyzed using appropriate statistical techniques viz. descriptive statistics, inferential statistics inter correlations and regression analyses. Results are shown in Tables 1-29.

DESCRIPTIVE STATISTICS

Means and Standard Deviations were calculated for the Male Adolescents (Table 1), Female Adolescents (Table 2), the Total Sample (Table 3), Brothers of Male Adolescents (Table 4), Sisters of Male Adolescents (Table 5), Brothers of Female Adolescents (Table 6), Sisters of Female Adolescents (Table 7), Mothers of Male Adolescents (Table 8), Mothers of Female Adolescents (Table 9), Fathers of Male Adolescents (Table 10), Fathers of Female Adolescents (Table 11).

t-ratios were calculated to find out the significance of difference between Male Adolescents and Female Adolescents on all the 46 variables (Table 12).

Intercorrelational analyses were done to study the relationship of Weight Status and Health Habits in relation to Personality, Stress and Coping measures; Indices of Negative Mental States, Health Protective Behaviour, Perceived Health Status; Indices of Positive Mental States, Symptoms of Depression, Hostility and Anxiety; Parental Bonding and Family - Adolescent Conflict. As the t-ratios revealed differences between Male and Female Adolescents, correlational analysis was conducted separately for Total Sample (Table 13), Male Adolescents (Table 14), and Female Adolescents (Table 15).

In addition to these, bivariate correlations were studied between Adolescents and their parents. A set of 17 variables were studied which included Weight Status, Health Habits, Perceived Health Status, various Personality Dimensions, Perceived Happiness Status and Anger Experienced and Anger Expressed.
Table 16 shows the correlations between Male Adolescents and their mothers. Table 17 shows the correlations between Male Adolescents and their Fathers. Table 18 shows the correlations between Female Adolescents and their mothers. Table 19 shows the correlations between Female Adolescents and their fathers.

Bivariate correlations were also studied between Adolescents and their brothers and sisters. A set of 27 variables were studied which includes Weight Status; Health Habits; various Personality Dimensions; Positive Mental States viz., Mental Health, Satisfaction with Life, Positive Affect and Perceived Happiness Status; Negative Mental States viz., Anger Experienced and Anger Expressed and Adolescent Depression; and Family-Adolescent Conflict.

Table 20 shows the correlations between Male Adolescents and their brothers. Table 21 shows the correlations between Male Adolescents and their sisters. Table 22 shows the correlations between Female Adolescents and their brothers. Table 23 shows the correlations between Female Adolescents and their sisters.

Regression analyses were conducted to delineate the significant predictors for BMI and Total Health Habits. Stepwise Multiple Regression Analysis using the SPSS- Version 11 was conducted. Tables 24 to 29 shows regression analyses for three groups viz. total sample, male adolescents and female adolescents, with two criterion variables viz. Body Mass Index (Tables 24,25,26) and Total Health Habits (Tables 27,28,29).

PERSONALITY, BMI AND HEALTH HABITS

It was hypothesized that BMI was expected to be positively related with Eysenckian Personality dimensions of Neuroticism and Psychoticism; Health Locus of Control-External and State -Trait Anxiety. Relationship of BMI and Extraversion was explored.

A perusal of inter-correlation tables (13,14,15) revealed that BMI was positively related with State Anxiety (r = .15) and negatively related
with Extraversion ($r = -.13$) in case of total sample. In case of male adolescents and female adolescents, no Personality variables viz. Eysenckian Personality dimensions, Health Locus of Control and State-Trait Anxiety correlated significantly with BMI.

A glance at the Regression analysis tables (24,25,26) revealed that for the criterion of BMI, State Anxiety emerged as the significant predictor in case of total sample ($\beta = .15$) and male adolescents ($\beta = .19$). No Personality variables emerged significantly in case of female adolescents.

The above results showed that the hypotheses were upheld only for the variable State Anxiety in case of total sample & male adolescents.

Previous research has shown different personality dimensions to be related to BMI.

Telch et al. (1988) reported that, as compared to obese non-bingers, obese individuals with Binge Eating Disorder tend to be heavier, report greater psychological distress and are more likely to have experienced a psychiatric illness (especially affective disorders). They also report an earlier onset of obesity and a greater percentage of their lifetime on a diet. Some studies have shown histories of greater weight fluctuation or weight cycling in obese binge eaters as compared with non-bingers, but others have not. These individuals are also more likely than non-binging obese people to drop out of behavioral weight loss programs and to regain weight more quickly (Mohan, 2000).

Morrison (1997) found that the scores for subjective well-being and locus of control were most strongly correlated with the positive pole of neuroticism (emotional stability), conscientiousness and extraversion.

An especially high score on neuroticism has been mentioned as a predisposition to experience long-term levels of negative affects such as fear, anger, shame, sadness and emotional eating (Costa and McCrae 1995).
According to Budjanovac (1996) passive form of behavior disorders indicate that neurotic adolescents do not manifest any forms of antisocial behavior (e.g., physical aggression, quarreling, keeping company with asocial persons), but do manifest some negative behavior patterns (e.g., seclusiveness, passivity, lack of interest, etc.) that can lead to eating disorders.

Possessing a stigma, a strongly undesirable physical or dispositional characteristic, typically has negative repercussions on many aspects of one's life. It has adverse effects on factors, such as interactions with non-stigmatized individuals and on many aspects of self-concept including body image. The stigma of obesity is particularly detrimental because it involves the perception of a deformation in the body as well as characterological weakness. Thus obesity evokes immediate negative response from the observers not only because of its displeasing aesthetic qualities but also because obese individuals are held personally responsible for their condition than they are to hold blind individuals responsible. Obese individuals who offer some medical reason for their weight problems (example a thyroid condition) or provide evidence that they are on diet to lose weight are less likely to be stigmatized. Hence Obesity and neurotic behavior may coexist. (Heatherton and Hebl, 1998).

In a meta-analysis of 137 personality traits as correlates of subjective well-being, DeNeve and Cooper (1998) found that Extraversion and agreeableness predicted positive affect reliably. Also they found that a low level of neuroticism was the strongest predictor of life satisfaction and happiness and of a low level of negative affect. One may infer therefore that neuroticism may be associated with anxiety eating leading to obesity.

Smith and Gallo (2001) investigated the influence of personality characteristics and reported that personality influences both physical and mental health. A good deal of research has focused on personality as a predictor of weight loss in clinically obese samples (Holt et al., 2001).
Faith et al. (2001) investigated the relationship between Eysenckian personality dimensions and BMI in a cross-sectional study. It was found that BMI was positively associated with neuroticism and negatively correlated with extraversion for females, and was positively associated with extraversion and psychoticism for males.

Niaura et al. (2003) studied the personality traits and weight in non-clinical sample and reported that MMPI (Minnesota Multiphasic Personality Inventory) ratings of repression and general maladjustment were associated with BMI. It was also found that repression was negatively associated with BMI, whereas maladjustment was positively associated with BMI.

Brummett et al. (2006) tried to investigate the NEO-PI (Neuroticism, Extraversion and Openness-Personality Inventory) scores as predictors of body mass index (BMI) over a 14 year period during midlife. It was found that average BMI levels during midlife were positively related to Neuroticism and negatively related to Openness, Agreeableness, and Conscientiousness. Relations for three domains were modified by gender. Neuroticism was significantly related to BMI in females only. Extraversion was positively related to BMI in males, whereas this relation was non-significant in females. The relation between Conscientiousness and BMI was significant in males and females, however, the magnitude of the negative association was stronger in females. Conscientiousness also predicted change in BMI during midlife such that participants who were lower in Conscientiousness tended to show larger gains in BMI with age.

According to Brummet et al. (2006) men and women also differed with respect to the effect of extraversion on BMI. Males who were higher in Extraversion tended to have higher BMI. For men, the attributes which characterize extraversion, i.e., being sociable, adventurous, and pleasure seeking may result in higher levels of BMI. It is not unreasonable to
imagine that men who tend toward pleasure-seeking and gregariousness may eat a higher caloric diet and or may consume more alcohol. For women the opposite relation was true, extraversion was associated with lower BMI.

Sullivan et al. (2006) investigated the personality characteristics in obesity and its relationship with successful weight loss. It was reported that obese subjects scored higher in novelty seeking, lower in persistence and lower in self directedness. Patients enrolled in the WUWMP (Washington University Weight Management Program) scored higher than obese persons in the general population in both reward dependence and cooperativeness. Patients who were successful in losing weight after 22 weeks of behavioural therapy scored lower in novelty seeking than those who were unsuccessful in losing weight. These results suggest that personality traits differ between lean and obese persons.

As regards Personality and Health Habits, it was hypothesized that Adolescents’ Health Habits viz. Eating Habits, Exercise Habits, Avoidance of Use of Alcohol and Drugs and Total Health Habits were expected to be negatively related with Eysenckian Personality dimensions of Neuroticism and Psychoticism; Health Locus of Control - External and State -Trait Anxiety. Relationship of Health Habits and Extraversion was to be explored.

A perusal of inter-correlation tables (13,14,15) revealed that **Eating Habits** was positively related to Health Locus of Control - Internal \( (r = .16) \) and negatively related with Neuroticism \( (r = -.20) \), State Anxiety \( (r = -.18) \) and Trait Anxiety \( (r = -.21) \) in case of total sample. Among male adolescents also, Eating Habits was positively related with Health Locus of Control-Internal \( (r = .19) \) and negatively related to Neuroticism \( (r = -.22) \) and State Anxiety \( (r = .22) \). In case of female adolescents, it was negatively related with Trait Anxiety \( (r = -.28) \) only.
Exercise Habits was positively related with Health Locus of Control-Internal ($r = .22$) and negatively related with Neuroticism ($r = -.15$) in case of total sample. In case of male adolescents, no personality variables correlated significantly with exercise habits. In case of female adolescents, Exercise Habits was positively related with Health Locus Of Control-Internal ($r = .32$) and negatively with Neuroticism ($r = -.18$), State Anxiety ($r = -.19$), and Trait Anxiety ($r = -.24$).

Avoidance of Use of Alcohol and Drugs was positively related with Neuroticism ($r = .15$) in case of total sample. (This finding was contrary to the expected hypothesis). No Personality variables correlated negatively with Avoidance of Use of Alcohol and Drugs for the total sample. In case of male adolescents and female adolescents, no significant correlations emerged between Personality Variables and Avoidance of Use of Alcohol and Drugs.

Total Health Habits was positively related with Health Locus Of Control-Internal ($r = .22$) and negatively related with Neuroticism ($r = -.15$), State Anxiety ($r = -.15$), Trait Anxiety ($r = -.19$) in case of total sample. Among male adolescents it was positively related with Health Locus Of Control-Internal ($r = .22$) only. No significant negative correlations emerged for male adolescents. In case of female adolescents, Total Health Habits was positively related with Health Locus Of Control-Internal ($r = .22$) and negatively related with State Anxiety ($r = -.21$) and Trait Anxiety ($r = -.28$).

A glance of regression analysis tables (27,28,29) revealed that for the criterion of Total Health Habits, Health Locus of Control-Internal ($\beta = .15$) emerged as a significant predictor for the total sample. Among male adolescents, Health Locus of Control-Internal ($\beta = .18$) and Health Locus Of Control External ($\beta = -.16$) emerged as significant predictors. In case of female adolescents, no Personality variables emerged as a significant predictor.
The above results showed that the hypotheses were generally upheld, except in case of Neuroticism which related positively with Avoidance of Use of Alcohol and Drugs which was contrary to the expectations.

Previous research has also shown different personality dimensions to be related to Health Habits.

Internal locus of control has been associated with knowledge about disease, ability to stop smoking (Coan, 1973), ability to lose weight (Balch and Ross, 1975), adherence to a medical regimen (Lewis et al., 1978), effective use of birth control (MacDonald, 1970), getting preventive inoculations (Dabbs and Kirscht; 1971), wearing seat belts and getting regular dental checkups (Williams, 1972).

Sonstroem and Walker (1973) studied locus of control and attitudes toward physical fitness and found that internals had more favorable attitudes towards physical activity, obtained significantly better fitness scores and engaged in greater amounts of voluntary physical exercise than did externals (Carlisle-Frank, 1991).

Like the research on health-facilitating behaviors, research on individuals who attempt to overcome health-damaging behaviors has also shown internals are often better off than externals (Pryer and Distefano, 1977).

High scores on Psychoticism and Neuroticism have been associated with alcohol abuse (Eysenck and Eysenck, 1977; Heath et al., 1997;), other substance use and abuse, or both (O’Boyle and Barratt, 1993).

Brownell and Wadden (1991) tried to study gender differences in obesity, and found that the stigma of obesity is far greater in females than males, and the vast majority of patients who seek treatment for obesity are females. They reasoned out that the increased feelings of anxiety, irritability, and depression that are the core components of Neuroticism may lead to poor health habits in women. For ego These negative feelings
may cause individuals to resort to palliative coping strategies such as eating and drinking more in the face of stress or routine demands. Depressive mood may also affect dieting habits. Negative emotions resulting from Neuroticism may result in generalized inactivity and/or failure to routinely exercise.

**Stein et al. (1996)** investigated personality or behavioural correlates of substance use in young people. It was found that girls who initiate smoking early in adolescence tend to be extraverted and have sociable personalities, whereas girls who continue to smoke in later adolescence and young adulthood tend to be depressed and have poor social relationships.

Data from 1999 Youth Risk Behaviour survey indicated that girls who perceive themselves as overweight, report wanting to lose weight and report engaging in unhealthy dieting behaviours (ego fasting, taking diet pills, vomiting, taking laxatives, drink more alcohol) than girls with healthier weight related attitudes and behaviours (Center for Disease Control and Prevention, 1999); this is despite the high caloric content of alcohol.

**Marks and Lutgendorf (1999)** tried to examine the extent to which facets of personality, perceived health competence (PHC), and health status predicted health behaviors among older adults. It was found that among older adults, higher levels of conscientiousness and lower levels of Neuroticism predicted a greater likelihood of engaging in social support! relaxation behaviors. After controlling for health status and education, higher levels of PHC (Perceived Health Competence) predicted greater exercise and dietary/health information-seeking behaviors.

Traits related to impulsivity - behavioral disinhibition are most strongly and consistently associated with substance use and abuse problems (Galen et al., 1997). The literature linking neuroticism - negative emotionality and substance abuse is somewhat less compelling (Sher et al., 1999), but still suggests a positive relationship. Extraversion -
Sociability has been less consistently related to substance use and abuse.

Extraversion, which was identified as a potentially important correlate of SUDs (Substance Use Disorders) (Sher et al., 1999), was a reliable cross-sectional predictor of AUD (Alcohol Use Disorder) and a weak but reliable predictor of the superordinate SUD—any category. Presumably, highly sociable individual might be at high risk for developing drinking problems primarily because they seek out situations where alcohol consumption is embedded in the social context (Sher et al., 2000).

Bosma et al. (1999) found that external locus of control, neuroticism and absence of active problem focussed coping explained almost fifty percent of the correlation between childhood social class and self rated poor health.

Sher et al. (2000) tried to examine the personality systems of Cloninger (as measured by Tridimensional Personality Questionnaire (TPQ) and Eysenck (as measured by Eysenck Personality Questionnaire) and its predictive utility of both systems for substance use disorder (SUD) diagnoses, both cross-sectionally and prospectively. Participants completed the EPQ and TPQ and were assessed via structured diagnostic interview at baseline and 6 years later. Both the EPQ and TPQ scales demonstrated bivariate cross-sectional and -prospective associations with SUDs. Within each system, those dimensions marking a broad impulsive sensation-seeking or behavioral disinhibition trait were the best predictors prospectively, although the two systems were differentially sensitive to specific diagnoses. These relations remained significant even with autoregressivity, other concurrent SUD diagnoses, and multiple personality dimensions statically controlled.

A behavioural risk factor for substance use, although not unique to young females, certainly plays a larger role for girls and young women than for boys. For girls, there is a strong relationship among weight concerns, dieting, and smoking (Austin and Gortmaker, 2001., The
Likewise, the relationship between weight related behaviours and alcohol use can be found across the continuum from simple dieting to full blown eating disorders (Stewart et al., 2000).

Pirkle and Ritcher (2006) conducted a study to identify personality, attitudinal and behavioural correlates of binge drinking and smoking among adolescent girls and young women. It was found that girls and young women who binge drank but did not smoke were more likely to be high self-monitors, to engage in disordered dieting, and believed that drinking provided an excuse to act with less inhibition. Those who smoked but did not binge drink were more likely to report depressive symptoms. Those who binge drank and smoked were more likely to be popular and to report depressive symptoms. Certain forms of avoidant coping and low religiosity were associated with all three types of substance use.

Tucker et al. (2006) examined the social regulation of health behavior and its associations with Conscientiousness and Neuroticism. It was found that the social regulation of health experienced by highly conscientious individuals has more to do with their own internalized notions of responsibility and obligation to others than to specific actions by others aimed at influencing their health habits. In contrast, individuals with higher neuroticism experience more attempts by others to influence their health habits but have more negative, affective and behavioural responses to these social influence attempts.

STRESS, COPING, BMI AND HEALTH HABITS

It was hypothesized that Adolescents' BMI was expected to be positively related with Life Event Stressors; Daily Hassles; Stress Symptoms; Emotion Focused Coping and Avoidance Coping. It was expected to be negatively related with Uplifts and Task Focused Coping.

A perusal of inter-correlation tables (13,14,15) revealed that in case
of total sample, no significant correlations emerged between Stress, Coping and BMI.

In case of male adolescents, BMI was positively related with Task Focused Coping \((r = .31)\). This finding was contrary to the expected hypothesis. No Stress variables correlated significantly with BMI in case of male adolescents.

In case of female adolescents, BMI was negatively related to Emotion Focused Coping \((r = -.18)\). Again this finding was contrary to the expected hypothesis. No Stress dimensions correlated significantly with BMI for female adolescents.

A glance of the regression analysis tables (24,25,26) revealed that for the criterion of BMI no Stress And Coping dimensions emerged as significant predictors in case of total sample.

In case of male adolescents, Task Focused Coping \((\beta = .31)\) emerged as significant predictor for the criterion variable BMI.

Among female adolescents, Emotion Focused Coping \((\beta = -.19)\) emerged as the significant predictor for the criterion variable BMI.

Hence, the above results showed that the hypotheses were not upheld in the expected manner. Instead it revealed that the findings were contrary to the expected hypotheses.

However contrary to the present results, Previous research has shown that dimensions of Stress and Coping were related to BMI.

Polivy and Herman (1999) reported that recent investigations of overeating have focused on the effect of stress manipulations that are inherently ego threatening. This focus is based on the proposition that threats to self-image may motivate individuals to "escape from self-awareness" (Heatherton et al., 1992). There is ample evidence to support this claim. As is supported by example, that when a stressor is ego-
threatening it triggers greater consumption of food by restrained eaters than unrestrained eaters.

Bjorntorp et al. (2000) reported that stress eating in human obesity is due to perturbation of the complex systems of energy intake regulation because stress is associated mainly with central obesity activating cortisol secretion. It is of interest to look at mechanism associated with this condition. The newly discovered eating hormone, leptin, often shows diminished efficiency in obesity, which has been reported to be caused by cortisol stress related cortisol secretion in abdominal obesity may therefore be associated diminished leptin effects ("leptin resistance"), decreasing satiety, the phenomenon of stress eating is commonly experienced by obese subjects. Such overeating often occurs when the obese patient is subjected to various stressors.

Bjorntorp et al. (2000) further reported that the stress related mechanism of obesity can be better understood by distinguishing the difference between central, abdominal, visceral obesity and peripheral gluteo femoral obesity. These two forms of obesity have completely different associations to stress factors. Central obesity is often associated with psychosocial and socioeconomic handicaps and excess use of alcohol and tobacco smoking as well as traits of depression and anxiety. In contrast peripheral obesity lacks such associations. In fact, in some instances these associations are negative, suggesting that peripherally obese subjects are subjected less to such stressors than the general population.

When examining putative stress-generated obesity, one has to look into the condition of central obesity. There seems to be several possibilities at hand. First, psychosocial stressors induce eating as a confronting 'surrogate and socioeconomic handicaps further make it difficult to consume nutritionally correct food. Alcohol over-consumption is also associated with such handicaps; in addition to containing energy itself, alcohol tends to increase appetite (Bjorntorp et al., 2000).
Dick et al. (1993) found that family support, stressful life events and emotional distress, correlated significantly with alcohol use which increases appetite and contains energy use.

Ryden et al. (2001) tried to define obesity related strategies for coping with psychological problems connected with obesity. Another purpose was to identify obesity related distress and explore the effect of coping on distress. The study was conducted on 2510 patients from the SOS (Swedish Obese Subjects) study. The SOS study was an ongoing nationwide project and its aim was to include 7000-10,000 persons in the registry study. From this pool 2000 surgical candidates and 2000 matched conventionally treated controls were recruited for the intervention study. The participants were followed for 10 years and about 1750 patients have undergone surgery. In the results, three coping factors were defined:- Social Trust, Fighting Spirit and Wishful thinking that proved to be psychometrically valid and reliable. Social Trust and fighting spirit were problem-focused, whereas wishful thinking was emotion-focused. Surgical candidates (Severely obese candidates) displayed lower levels of problem-focused and higher levels of emotion-focused coping. They also identified two distress factors: Intrusions and Helplessness. Wishful thinking was positively related to distress, and Social Trust and Fighting Spirit were inversely related, thus explaining the higher levels of distress reported by the surgical candidates (Severely obese candidates).

Cash et al. (2005) investigated the reliability and validity of the newly developed Body Image Coping Strategies Inventory (BICSI), which measures how individuals characteristically manage threats or challenges to body-image experiences. The results revealed that BICSI significantly converged with other pertinent measures of body image evaluation, affect and investment, and with psychosocial functioning (i.e. self-esteem, social support, and eating disturbance). Regression analyses indicated that multiple coping strategies predicted individual body image quality of life and their eating attitudes. Compared with men, women used all coping
strategies more, especially appearance fixing strategies.

Mallett and Swim (2006) investigated proactive coping with discrimination among heavy women in both a high impact lab study (101 women) and a daily diary study (62 women). It was reported that heavy women assessed greater harm and fewer coping resources. When heavy women used primary control (attempts to change the environment) coping efforts, they experienced positive interpersonal outcomes and less negative intrapersonal outcomes.

Bulik and Juczynski (2006), conducted a study to investigate if coping with stress and other psychological variables contribute to the prediction of reducing overweight in women, and to compare level of these predictors before and after the program of reducing overweight based on psychological actions. The study revealed that coping with stress is a determinant of reducing overweight in women, task and avoidance oriented strategies, in particular. Perceiving stress, self-efficacy beliefs and level of optimism also appeared as predictors of reducing excessive weight in women.

As regards Stress, Coping And Health Habits it was hypothesized that Adolescents Health Habits viz. Eating Habits, Exercise Habits, Avoidance of Use of Alcohol and Drugs and Total Health Habits were expected to be negatively related with Life Event Stressors; Daily Hassles; Stress Symptoms; Emotion Focused Coping and Avoidance Coping. It was expected to be positively related with Uplifts and Task Focused Coping.

A perusal of inter-correlation tables (13, 14, 15) revealed that Eating Habits was positively related with Uplifts \((r = .14)\) and negatively related with Stress Symptoms \((r = -.21)\) in the case of total sample. Eating habits were again found to be negatively related with stress symptoms for both male adolescents \((r = -.19)\) and female adolescents \((r = -.25)\). No Coping dimensions were found to be significantly related in case of total sample,
male and female adolescents.

**Exercise Habits** was found to be positively related with Uplifts \( (r = .23) \) and negatively related with Stress Symptoms \( (r = -.19) \) in the case of total sample. No Coping dimensions were found to be significantly related with Exercise Habits for total sample. Among male adolescents no Stress as well as Coping dimensions were found to be significantly correlated with Exercise Habits. In case of female adolescents, Exercise Habits was found to be positively related with Task Focused Coping \( (r = .18) \) and Uplifts \( (r = -.25) \) and negatively related with Stress Symptoms \( (r = -.30) \).

**Avoidance of Use of Alcohol and Drugs** was found to be only negatively related to Life Event Stressors \( (r = -.15) \) in the case of total sample. No significant relation between Coping dimensions and Avoidance of Use of Alcohol and Drugs emerged for the total sample. Among male adolescents also Avoidance of Use of Alcohol and Drugs was found to be only negatively related with Life Event Stressors \( (r = -.19) \). No significant correlations emerged between Coping dimensions and Avoidance of Use of Alcohol and Drugs for male adolescents. In case of female adolescents, no significant correlations emerged between Stress and Coping dimensions and Avoidance of Use of Alcohol and Drugs.

**Total Health Habits** was positively related with Task Focused Coping \( (r = .13) \) and Uplifts \( (r = .21) \) and negatively related with Stress Symptoms \( (r = -.23) \) in case of total sample. Among male adolescents, Total Health Habits was positively related with Uplifts \( (r = .18) \) and negatively related with Stress Symptoms \( (r = -.28) \). No significant correlations emerged between Coping dimensions and Total Health Habits in case of male adolescents. Again in the case of female adolescents Total Health Habits was positively related with Uplifts \( (r = .22) \) and negatively related with Stress Symptoms \( (r = -.28) \). No significant correlations emerged between Coping dimensions and Total Health Habits in case of male adolescents.
A glance of the Regression analysis tables (27,28,29) revealed that for the criterion of Total Health Habits, Stress Symptoms ($\beta = -.20$) and Uplifts ($\beta = .16$) emerged as significant predictors in case of total sample. In case of male adolescents, no Stress and Coping dimensions emerged as significant predictors for the criterion Total Health Habits. In case of female adolescents, only Stress Symptoms ($\beta = -.25$) emerged as significant predictors for the criterion Total Health Habits.

Hence the above results showed that the hypotheses were upheld. *Previous research has also shown that different Stress and Coping dimensions were related to Health Habits.*

Personal coping styles have been examined in relationship to substance use. *Cooper et al. (1988)* found that university students with avoidant coping styles who thought of drinking as a coping mechanism were likely to use alcohol and experience alcohol related problems. Other research suggests that avoidance coping may be a stronger predictor of alcohol use in females than in males (*Thombs et al., 1993.*, and *Stewart et al. 2001*).

Numerous studies have suggested that prolonged high levels of psychological stress predict poorer health (*Cohen, 1996*). However, the majority of previous studies suggests that stress perception, not stressor exposure, predicts negative health symptoms (*Brosschot et al., 1998*). Others have found predictive value for both exposure and perception measures of stress (*Mc Donough and Walters, 2001* and *Mohan and Sehgal, 2002*).

*Cohen et al. (1995)* postulated a heuristic model of the stress process that integrate environmental demand perspectives (such as perception, appraisal and response processes), and biological models (such as, activation of physiological systems in response to repeated demands). This unified model suggests that environmental demands can lead to physiological or behavioural responses that increase one's risk of
illness, with the appraisal of demands and adaptive coping behaviors as critical mediating factors. Environmental demands include acute life events, chronic strains, and daily hassles all of which can elicit a stress response, suggesting that it is not just dramatic events but also the many events of daily life that can exact a toll (Thoits, 1995).

Ingledew and Hardy, (1996) aimed to explore the relationship between health behaviors which participants reported using as coping strategies, and other, more documented, coping strategies. Behaviors included relaxations, eating and weight control, preventive medicine, exercise and fitness, safety, sleep, use of caffeine, alcohol use, smoking and general self-care. It was found that women tended more towards Emotion-Focused Coping and Eating.

Koff and Sangani (1997) examined relationships between coping strategies and eating related behaviours. Results showed that emotion-oriented coping and avoidance via distraction were positively associated with eating disturbances, psychological distress, psychiatric symptomatology, and health problems. Task-oriented efforts and avoidance via social diversion were negatively or unrelated to dysfunction. The authors concluded that the elevated use of emotion-oriented coping should be considered a risk factor for eating disturbances.

Kaplan and Saddock (1998) reported that obese patients maybe characterized as emotionally disturbed persons who because of the availability of eating cues in their environment have learned to use overeating as a means of coping with psychological problems. Many obese people report that they overeat whenever they are emotionally upset, often, soon or thereafter. Reports linking emotional factors and obesity over the long range seem more specific. Some obese people lose large amounts of weight when they fall in love and gain weight when they lose the loved ones. The habitual eating pattern of many obese people often seemed to be similar to pattern found in experimental obesity. Impaired satiety is a particularly important problem. Obese people seem inordinately
susceptible to food cues in their environments, to the palatability of the food and to the inability of stop eating when food is available. They are usually susceptible to all kinds of external stimuli to eating. But they remain relatively unresponsive to the usual internal signals of hunger. Some are unable to distinguish between hunger and other kinds of dysphoria.

Kaplan and Saddock (1998) further reported that when eating disorder patients are more troubled, they tend to become disturbed in one of two directions. If they have prominent anorexic symptoms, they are likely to fit a constricted/overcontrolled profile. These patients manifest a constriction and restriction of pleasure, needs, emotions, relationships, self-knowledge, self-reflection, sexuality and depth of understanding of others that plays out in the domain of food as well. They tend to feel empty or barren inside, are chronically dysphoric and feel depressed, inadequate, anhedonic, anxious and ashamed. Their personality pathology tends to be avoidant or schizoid. The more a patient matches this profile, the lower her level of adaptive functioning tends to be. This personality constellation may in some cases reflect in part a characterological adaptation to a history of sexual abuse.

In contrast, when patients with bulimic symptoms (with or without a history of anorexia) are more disturbed, they tend to be emotionally dysregulated, undercontrolled and impulsive. They experience intense, poorly regulated emotions and they tend to fly into rages. Rather than fleeing relationships to escape dysphoria (as is the case with the low-functioning anorexic patients), they desperately seek relationships to soothe themselves when they cannot regulate their own emotions. For these patients, eating-disordered symptoms appear to be one more instance of impulsive behavior designed to regulate poorly modulated affects.

Kaplan and Saddock (1998), further reported that several of the mentioned stressors may also be followed by physical inactivity causing
obesity. However, some of the antidepressant drugs clearly promote obesity.

There is growing empirical evidence that exposure to stress and resulting stress reactions are linked with a variety of dexterous health effects (Dohrenwend, 2000). Increased levels of stress and negative life events among those in lower socioeconomic strata are also posited to be important not only as determinants of health, but also as mechanisms by which socioeconomic inequalities in physical (Baum et al., 1999) and mental (Turner and Avison, 2003) health are produced. Exposure to intense and ostensibly stressful life events is associated with substance abuse, psychiatric disorders and Suicide (Dohrenwend, 2000).

Mao et al. (2003) investigated the relation between coping strategies, Hostility, and Depressive Symptoms: A Path Model. It was suggested that coping has a direct relation with depressive symptoms as well as indirect relation mediated by hostility. Passive coping may lead to increased hostility, resulting in depressive symptoms. Active coping may have the opposite effect.

Khosla and Hanghal (2004) tried to examine the influence of optimism and pessimism on coping processes. An attempt was made to identify the possible relationship between coping resources and strategies in dealing with stress. Results of the study revealed that optimists as compared to pessimists displayed higher cognitive and physical resources. They did not differ with respect to their total coping resources. Pessimists as compared to optimists reported using significantly more emotion-focused coping strategies. However, optimism was not found to be associated with greater coping resources or problem-focused coping strategies.

Weekes et al. (2005) investigated whether stress predicted health symptoms differentially for the two sexes. Sex differences were observed in the association among perceived stress, stressor exposure, and
negative health symptom rates specifically, while higher perceived stress and higher stressor exposure rates independently predicted higher negative health symptom rates in females, only higher stressor exposure rates independently predicted higher negative health symptoms in males. Among females, all stress and depression measures correlated significantly with health symptoms. However, among males, health symptoms were not significantly correlated with state anxiety, trait anxiety, perceived stress, nor depression. Among males, health was correlated with only stressors and daily hassles.

Lantz et al. (2005) investigated the relationship among socioeconomic indicators, five measures of stress/ negative life events, and the health outcomes of mortality, functional limitations and self-rated health. Results revealed that (i) life events and other types of stressors are clearly related to socioeconomic position; (2) a count of negative lifetime events was positively associated with mortality; (3) a higher score on a financial stress scale was predictive of severe/moderate functional limitations and fair/poor self-rated health at wave 3 and (4) a higher score on a parental stress scale was predictive of fair/poor self-rated health at wave 3.

NEGATIVE MENTAL STATES, BMI AND HEALTH HABITS

It was hypothesized that Adolescents' BMI was expected to be positively related with Adolescent Depression; Negative Affect, Anger Experienced (viz. State Anger and Trait Anger) and Anger In - Anger Out dimensions. It was expected to be negatively related with Anger Control.

A perusal of Inter-correlation tables (13, 14, 15 ) revealed that no significant correlations between Negative Mental States (viz. Adolescent Depression, Negative Affect, State Anger, Trait Anger, Anger In - Anger Out, Total Anger Expressed) and BMI emerged for all the three groups i.e. the total sample, male adolescents and the female adolescents. No
significant relations emerged between Anger Control and BMI.

A glance of the Regression analysis tables (24, 25, 26) revealed that in case of total sample no Anger dimensions and Negative Affect emerged as a significant predictor for the criterion variable BMI. In case of male adolescents, only Trait Anger ($\beta = .22$) emerged as a significant predictor for the criterion variable BMI. In case of female adolescents, no Anger dimensions and Negative Affect emerged as significant predictors for the criterion of BMI.

The above results showed that these hypotheses were not upheld although previous research has shown that dimensions of Negative Mental States were related to BMI.

Maiman et al. (1979) found that 70% of nutrition professionals believed that Obesity was caused by emotional problems.

Paine (1982) in a comparative study found obese subjects to be more prone to perfectionism than non-obese subjects. Klesges (1984) compared normal weight and overweight students and found that overweight subjects were more depressed and self-conscious and less assertive than normals.

O’Connor and Dowrick (1987) presented subjects with a list of pessimistic self-statements concerning weight and eating. Compared with normal subjects overweight students engaged in these negative cognitions more frequently.

Data from clinical and community samples show that neither being obese nor being overweight is associated with high levels of depression or anxiety or poor self-esteem (Klesges et al., 1992).

Horsten et al. (1997) examined the relationship of depressive symptoms, social support, and lipid profile in healthy middle aged women. It was found that, women with a low serum cholesterol, defined as the lowest tenth of the cholesterol distribution, reported significantly more depressive symptoms. In addition, depressive symptoms showed a
significant inverse linear association with high-density lipoprotein (HDL). Therefore low cholesterol levels in middle-aged healthy Swedish women were associated with a higher prevalence of depressive symptoms and with lack of social support, it may lead to increased mortality, particularly suicide.

Ramirez et al. (2001) in their study found that compared with normal weight individuals, obese persons over estimate or distort their body size more, are more dissatisfied and preoccupied with their physical appearance, and avoid more social situations because of their appearance concerns. This was also reported by Cash (1990).

Becker et al. (2001) found that obese women had the highest rates of mental disorders overall as well as for all subgroups of mental disorders. Furthermore, they found that obese women had higher rate of comorbidity.

Teenagers who don't manage their anger, either by suppressing feelings, or the other extreme of losing one's temper are at high risk for weight gain than those who do (American Heart Association's Annual Conference on cardiovascular Disease, 2004).

Problems expressing anger translate into eating disorders and increased weight, which leads to a high risk of cardiovascular disease at a young age (Mueller, 2004).

Mueller et al. (2004) reported that anger habits in a child tended to remain stable over time. However average anger control scores increased over time and were higher in children with lower BMIs. Anger expression scores decreased over time but were higher in children with increasing BMIs. None of the STAXI State-Trait Anger Expression Inventory variables differed by gender or ethnicity. Unhealthy ways of expressing anger are associated with overweight. Anger control is a healthy way of expressing anger. Overweight kids have poor health behaviours, including anger expression which may lead to increased weight, especially in girls.
Dong et al. (2004) examined the relationship between obesity and depression in a sample of extremely obese individuals and their siblings and parents. It was found that greater odds for depression were found for the obese and the offspring of depressed parents. The odds ratio for depression increased with BMI and number and number of chronic medical conditions (p<0.0001). BMI, race, marital status, chronic medical conditions and family history were the predictors of depression for both the genders.

In a study conducted by Carr and Friedman (2005) in adults, their age ranging from 25 to 74, found that very obese persons (BMI=35 and above) as compared to normal weight persons (BMI=18.5 - 24.9), report significantly lower self-acceptance scores (5.22 vs. 5.56; P<.001), more frequent daily discrimination (1.58 vs. 1.39. P< .001). The obese persons are significantly more likely than normal weight persons to attribute their discriminatory experiences to weight or appearance.

As regards Negative Mental States and Health Habits, it was hypothesized that Adolescents' Health Habits viz. Eating Habits, Exercise Habits, Avoidance of Alcohol and Drug and Total Health Habits were expected to be negatively related with Adolescent Depression; Negative Affect; Anger Experienced (viz. State Anger and Trait Anger) and Anger In - Anger Out dimensions. It was expected to be positively related with Anger Control.

A perusal of inter - correlation tables (13, 14, 15) revealed that Eating Habits was positively related with Anger Control (r = .15) and negatively related with Anger In (r = .16), Total Anger Expressed (r = -.20) and Negative Affect (r = -.14) in case of total sample. Among male adolescents, only Anger In (r = -.18) related negatively and significantly with Eating Habits. In case of female adolescents, only Total Anger Expressed (r = -.21) related negatively and significantly with Eating Habits.

Exercise Habits was positively related with Anger Control (r=.23)
and negatively related with Total Anger Expressed \((r = -.22)\) and Adolescent Depression \((r = -.14)\) in case of total sample. In case of male adolescents, no Anger dimensions and Negative Affect correlated significantly with Exercise Habits. In case of female adolescents, Exercise Habits was positively related with Anger Control \((r = .31)\) and negatively with Total Anger Expressed \((r = -.26)\) and Adolescent Depression \((r = -.21)\).

**Avoidance of Use of Alcohol and Drugs** was positively related to Trait Anger \((r = .13)\) and Total Anger Expressed \((r = .14)\) in the case of total sample. **These findings are contrary to the expected hypothesis.** It was negatively related to Anger Control \((r = -.18)\) in case of total sample. **This finding again was contrary to the expected hypothesis.** In case of male adolescents, Avoidance of Use of Alcohol and Drugs was positively related with Anger Out \((r = .21)\) and Total Anger Expressed \((r = .19)\). **This finding was again in contradiction to the expected hypothesis.** No significant correlations emerged between Anger dimensions, Negative Affect and Avoidance of Use of Alcohol and Drugs in case of female adolescents.

**Total Health Habits** was positively related with Anger Control \((r = .17)\) and negatively related with Total Anger Expressed \((r = -.20)\) and Adolescent Depression \((r = -.15)\) in case of total sample. No significant correlation was found in case of male adolescents. In case of female adolescents, Total Health Habits was positively related to Anger Control \((r = .25)\) and negatively related to Total Anger Expressed \((r = -.25)\) and Adolescent Depression \((r = -.22)\).

A glance of the Regression analysis tables \((27, 28, 29)\) revealed that no dimensions of Anger and Negative Affect emerged as significant predictors for the criterion Total Health Habits for all the three groups i.e. the total sample, male adolescents and female adolescents.

The above results showed that the hypotheses were upheld except in the case of Avoidance of Use of Alcohol and Drugs which revealed
findings which were contrary to the expectations.

Previous research has also shown that dimensions of Negative Affect and Anger were related to various Health Habits.

Johnson and Browman (1987) examined the relationship between anger expression, other psycho-social measures, and health problems in a nationally representative, errors-sectional sample of black adults. Subjects indicating a high level of outwardly expressed anger during a period in which they experienced a severe personal problem had a significantly higher number of health problems than their counterparts who expressed low and moderate levels of anger. It was also found that blacks, who were unemployed were more likely to have a higher numbers of health problems if anger was expressed outwardly at a high level. The relationship was found independent of age, gender, urban city, smoking and drinking problems. It suggests that blacks who are at increase risk of health problems may be identified by how often anger is experienced and expressed during periods of emotional distress.

Geus et al. (1993) assessed the association of aerobic fitness with psychological make up and physiological stress-reactivity in a group of untrained men, as well as the effects of 4 and 8 months of exercise training. Psychological assessment included questionnaires on Personality (Neuroticism, Type A, Hostility), Coping Styles (Anger In, Anger Out), Negative Affect (Depression, Anxiety), and Self Esteem. No cross sectional relationships were found between aerobic fitness, defined as the maximal oxygen during an exhaustive exercise test, and any of the psychological variables. In addition, psychological make-up did not change as a consequence of exercise training. In contrast to the hypothesis aerobic fitness was associated with high, rather than low cardiovascular reactivity. Longitudinal effects of training were limited to a reduction in the overall levels of heart rate and diastolic blood pressure. This suggests that regular exercise does not increase the resistance to stress-related disease by influencing psychological makeup or acute physiologic reactivity.
Stein et al. (1996) reported that extensive research documents the relationship between depressive symptoms and smoking. Girls are likelier than boys to report depressive symptoms (Nolen-Hoeksema, 2001; Schoen et al., 1997) suggesting that the link between depression and smoking may be stronger for young females than for young males. The relationship between depression and drinking behaviour is less conclusive. Hussong and Chassin (1994) did not find an association between depressed mood and alcohol use in adolescence or college students. Yet Wills et al. (1999) found greater alcohol use among adolescent with higher negative affect.

Adolescent cigarette smoking has also been associated with depressive disorders, but the direction of causality is not yet known. Data from the 1992 National Longitudinal Alcoholic Epidemiological survey showed that early onset of regular tobacco use (smoking before age 13) was significantly and positively associated with having a lifetime diagnosis of major depressive disorder (Hanna and Grant, 1999).

Depression is a major risk factor for suicide, which ranks third as a cause of death among teenagers in the United States, and is often accompanied by other psychiatric disorders, poor social functioning, and a high risk of substance abuse (Bouchard, 2001).

Brooks et al. (2002) carried out a Massachusetts Adolescent Health Survey and reported that, among female adolescents only who participated, tobacco use was associated with increased odds of reporting "depression or stress" for each increasing level of tobacco use.

Adolescent cigarette use appears to be a strong predictor of future psychopathology, such as panic attacks and panic disorder (Isenee et al. 2003). Indeed, the links between substance use and psychiatric disorder have been found in at least one study to be primarily accounted for by regular smoking in adolescents (Boys et al. 2003).

Chang et al. (2005) conducted a study on 486 adolescents of
diverse ethnic background, two thirds of whom were female and with an overall mean age of 16.6 years (SD=1.4). One hundred thirty-nine reported ever using tobacco products and 68 were current users. The association between current tobacco use and mental health symptoms, including the substance use disorders, was examined. When compared with their non-smoking counterparts, currently smoking boys and girls were more likely to satisfy DSM-IV criteria for any substance abuse disorder and cannabis disorder. Currently smoking girls were also more likely to satisfy DSM IV criteria for alcohol use disorder when compared with non smoking girls. Currently smoking boys and girls endorsed more mental health symptoms overall and in particular attention deficit disorder and conduct disorder symptoms. Currently cigarette smoking girls also reported more symptoms of depression, eating disorder, and mania, as well as increased risk of having received mental health treatment.

Chang et al. (2005) examined the association among smoking and other mental health symptoms including substance use disorders, and mental health treatment among adolescents treated at a large hospital based young adult clinic. It was reported that adolescent cigarette smoking is generally more common than alcohol and illicit drug use, and these results highlights its multifarious linkages with use of other substances and mental health symptoms.

Stephen and Peter (2005) investigated whether negative emotions predict alcohol consumption, saturated fat intake, and physical activity in older adults. It revealed that anxiety was negatively correlated with alcohol consumption. High levels of depression, trait anger, and outward anger expression were positively associated with saturated fat intake. Trait anger was also associated with less aerobic exercise. Inward anger expression was positively correlated with regular participation in strength training. It suggests that anger, anger expression style, and depression interact with healthy and unhealthy behaviour patterns and that these interactions may be complex.
HEALTH PROTECTIVE BEHAVIOUR, PERCEIVED HEALTH STATUS, BMI AND HEALTH HABITS

It was hypothesized that Adolescents' BMI was expected to be negatively related with Health Habits viz. Eating Habits, Exercise Habits, Avoidance of Use of Alcohol and Drugs and Total Health Habits; Health Protective Behaviour and Perceived Health Status.

A perusal of inter-correlation tables (13,14,15) revealed that there were no significant correlations between BMI and Health Habits viz. Eating Habits, Exercise Habits, Avoidance of Use of Alcohol and Drugs, Total Health Habits for all the three groups - the total sample, male adolescents and female adolescents.

It also revealed that BMI did not correlate significantly with Health Protective Behaviour and Perceived Health Status in all the three groups i.e. the total sample, male adolescents and female adolescents.

A glance of Regression analyses tables (24, 25, 26) revealed that for the criterion of BMI, Health Habits, Health Protective Behaviour and Perceived Health Status did not emerge as a significant predictor.

The above results showed that above mentioned hypotheses were not upheld but previous research has shown that Health Habits, Health Protective Behaviour and Perceived Health Status were related to Body Mass Index.

BMI is associated with both energy intake and physical activity. A small positive energy balance over longer periods of time leads to large body weight increase. This means that with respect to energy use, overweight could easily be caused by a relatively small but prolonged surplus in energy intake (Mathus-Vliegen, 1998; Cutler et al., 2003; Health Council of the Netherlands, 2003; Lindstrom et al., 2003).

When the level of total caloric expenditure is lower than caloric intake, accumulation of adipose tissue ensures. Thus, sedentary activities
and low levels of exercise should predict onset of obesity. Low levels of exercise and sedentary behaviour have predicted future weight gain among adults (Ching et al., 1996), although null effects have occurred (Klesges et al., 1992). Low levels of exercise and high rates of sedentary behaviours also have predicted increases in body mass during adolescence (Proctor et al., 2003), though these relations have not been consistently observed (Salbe et al., 2002). Indeed, one study found that adolescents who reported exercising for weight-control purposes were at increased risk for future obesity onset (Stice et al., 1999).

Paradoxically, adolescent girls with elevated scores on dieting scales are at increased risk for future onset of obesity and weight gain (Field et al., 2003)—an effect that has also occurred in prospective studies at adults (French et al., 1994). Radical weight control behaviour, such as vomiting and laxative abuse, also have predicted increases in body mass over time. One interpretation of these findings is that dieting and radical weight control methods may promote weight gain because these behaviors lead to increased metabolic efficiency (Klesges et al., 1992).

In addition, researchers have posited that negative affect is a risk factor for obesity (Hoppa and Hallstrom, 1981). The effect regulation model posits that dysphoric individuals eat in an effort to provide comfort or distraction from negative emotions, which increases the risk for weight gain.

The energy balance model of adiposity stipulates that weight gain occurs if caloric intake exceeds energy expenditure (Rosenbaum, et al, 1997). Thus, elevated caloric intake should predict obesity onset. Consumption of high-fat foods is thought to be a particularly powerful predictor of weight gain because of the efficiency with which fat is metabolized and its high caloric density and palatability (Golay and Bobbioni, 1997).
Another form of high caloric intake—binge eating—is receiving attention as a potential risk factor for obesity (McGuire et al., 1999). Binge eating might play a particularly insidious role in obesity promotion because it particularly leads to physiological changes that increases the likelihood that binge eating will persist over time.

Levin et al. (1999) investigated associations of underweight and overweight with physical activity among high school students in United States. It was reported that adolescent boys who were underweight or overweight were less likely to be physically active than boys of normal weight. Adolescents girls who were overweight or at risk for overweight were less likely to be involved with sports than girls of normal weight; and girls who were underweight were less likely to be enrolled in physical education.

Overweight and obesity are associated with decreasing levels of both physical and emotional well-being. However, this deterioration in health status is more evident in physical than emotional well being, indicating that the burden of overweight is primarily perceived as physical in nature (Doll et al. 2000).

Field et al. (2003) assessed whether dieting to control weight was associated with weight change among children and adolescents. It was found that during a 3 years follow up, dieters gained more weight than non dieters. Among the girls, frequency of dieting was positively associated with increases in age and sex specific z scores of BMI ($\beta=0.05$ & $\beta=0.04$ for frequent dieters and infrequent dieters vs non dieters). Among the boys, both frequent and infrequent dieters gained 0.07 z scores of BMI more than non-dieters. Binge eating was more common among the girls, but in both sexes, it was associated with dieting to control weight. In addition, boys who engaged in binge eating gained significantly more weight than non dieters.
Stice et al., (2005) tested whether certain psychological and behavioral variables predicted future onset of obesity. It was found that self-reported dietary restraint, radical weight control behaviours, depressive symptoms, and perceived parental obesity - but not high-fat food consumption, binge eating, or exercise frequency - predicted obesity onset.

Tolstrup et al. (2005) assessed the relation between drinking pattern and body mass index and waist and hip circumference. It was found that among men, total alcohol intake was positively associated with BMI & large waist circumference, and inversely associated with small hip circumference. Among women, total alcohol was associated with high BMI, large waist, and small hips only for the highest intake (28+ drinks/week). The most frequent drinkers had the lowest odds ratios (OR) for being obese.

Overweight and physical activity are inextricably linked. Overweight is caused by an energy imbalance of more calories consumed than used, and physical activity plays a key role in maintaining an appropriate energy balance because it helps burn calories that are consumed in excess. Physical activity also reduces the risk of certain cancers, diabetes, and high blood pressure and contributes to healthy bones and muscles. (Centre for Disease Control and Prevention, 2005)

Cornelisse-Vermaat et al. (2006) studied the structural relationships between body mass index, perceived health and happiness. An indirect effect of body mass index on happiness, via perceived health was found. It was also found that smoking had a negative effect on body mass index, and indulging in sports had a positive effects on perceived health.

Cornelisse-Vermaat et al. (2006) found an indirect effect of body mass index on happiness, via perceived health. A strong negative effect of BMI on perceived health was found, indicating that BMI scores led to
relatively low health ratings. Perceived health had a very strong positive
effect on happiness. BMI had a small negative effect on happiness,
significant only at the 10% level. It indicated that the effect of BMI on
happiness is mainly indirect, via perceived health.

As regards Health Protective Behaviour, Perceived Health
Status And Health Habits it was hypothesized that Adolescents' Health Habits viz. Eating Habits, Exercise Habits, Avoidance of Use of Alcohol and Drugs and Total Health Habits were expected to be positively related with Health Protective Behaviour and Perceived Health Status.

A perusal of Inter-correlation tables (13, 14, 15) revealed that Eating Habits was positively related to Health Protective Behaviour \( (r = .23) \) and Perceived Health Status \( (r = .14) \) in case of total sample. There were no significant correlation in case of male adolescents. Among female adolescents, Eating Habits was positively related to Health Protective Behavior \( (r = .28) \) only.

Exercise Habits was positively related to Health Protective
Behaviour \( (r = .36) \) and Perceived Health Status \( (r = .23) \) in case of total sample. Among male adolescents also Exercise Habits was positively related to Health Protective Behaviour \( (r = .36) \) and Perceived Health Status \( (r = .29) \). Among female adolescents, Exercise Habits was positively related to only Health Protective Behavior \( (r = .35) \).

Avoidance of Use of Alcohol and Drugs was not having any significant correlation with Health Protective Behaviour and Perceived Health Status in all the three groups i.e., the total sample, male adolescents and female adolescents.

Total Health Habits was positively related to Health Protective
Behaviour \( (r = .34) \) and Perceived Health Status \( (r = .18) \) in case of total sample. Among male adolescents also Total Health Habits was related to Health Protective Behaviour \( (r = .32) \) and Perceived Health Status \( (r = .22) \).
In case of female adolescents, Total Health Habits was positively related to Health Protective Behaviour ($r = .35$) only.

A glance of the Regression Analysis Tables (27, 28, 29) revealed that for the criterion of **Total Health Habits**, Health Protective Behaviour ($\beta = .34$) and Perceived Health Status ($\beta = .15$) emerged as significant predictors in case of total sample.

Among male adolescents also, Health Protective Behaviour ($\beta = .32$) and Perceived Health Status ($\beta = .26$) emerged as significant predictors of Total Health Habits.

In case of female adolescents, only Health Protective Behaviour ($\beta = .35$) emerged as a significant predictor of Total Health Habits.

Hence the above results showed that the proposed hypotheses were upheld.

Previous research has also shown that Health Protective Behaviour and Perceived Health Status were related to Health Habits.

Covertois and Mangency, (2003) assessed the adolescents’ perception of their own risktaking behavior. They found that girls have a tendency to judge as more serious and more auto-aggressive behaviours from the medico-psychological group (thoughts of death, tendency of suicide, and eating disorders).

Motl et al. (2005) conducted a study to examine the direct and mediated effects of perceived equipment accessibility and neighborhood safety on physical activity across a one year period among adolescent girls. An initial analysis demonstrated that neighbourhood safety did not exhibit cross sectional or longitudinal direct effects on physical activity, whereas equipment accessibility exhibited a statistically significant cross sectional but not longitudinal direct effect on physical activity. However the secondary analysis demonstrated that self efficacy for overcoming barriers
mediated the cross sectional effect of equipment accessibility on physical activity.

Yamamoto et al. (2005) conducted a study to determine whether adolescents will modify their ordering behavior if calorie and fat nutrition information is posted on the restaurant menu. It resulted that for the first 106 adolescents enrolled, 75 did not change any of their orders after being shown the calorie and fat content information. For the 31 who did change some of their orders, 43 meals resulted in decreased calories and 11 meals resulted in increased calories (20 resulted in a more expensive meal, 23 resulted in a less expensive meal and 11 resulted in no change in the cost of the meal; average change $0.027 increase) of the 27 who rated themselves as too fat or slightly overweight, only 9 (33%) changed their orders. Hence it shows that the provision of calorie and fat content information on the menus did not modify the food ordering behavior for the majority of adolescents. However, the provision of the nutrition information should still be encouraged because it resulted in some calorie/fat reduction by some of the adolescents and it did not adversely affect the restaurants revenue.

Valente et al. (2005) conducted a study to find the susceptibility of smoking from 1,486 6th and 7th graders in southern California. It was found that popularity was associated with increased susceptibility to smoke and smoking over the 1 year interval between surveys. Although the association was strongest for non white boys, evidence of interactions between popularity and gender or ethnicity could not be found.

POSITIVE MENTAL STATES, BMI AND HEALTH HABITS

It was hypothesized that Adolescents' BMI was expected to be negatively related with Mental Health and its dimensions viz. Being Comfortable With Self, Being Comfortable with Others, Perceived Ability to Meet Life Demands and Total Mental Health; Positive Affect; Satisfaction With Life, Generalized Self Efficacy; Health Efficacy;
Optimism and Perceived Happiness Status.

A perusal of inter-correlation tables (13, 14, 15) revealed that BMI was positively related with Positive Affect (r = .14) in case of total sample. This finding was in contradiction to the expected hypothesis.

In case of male adolescents, BMI was positively related with Perceived Ability to Meet Life Demands (r = .25), Generalized Self Efficacy (r = .19) and Positive Affect (r = .26). Again these findings were in contradiction to the expected hypotheses.

In case of female adolescents, BMI was negatively related to Optimism (r = -.18) which was in accordance with the expected hypothesis.

A glance of the Regression analysis tables (24, 25, 26) revealed that for the criterion BMI, Positive Affect (β = .20) emerged as a significant predictor in case of total sample. Among male adolescents, Perceived Ability to Meet Life Demands (β = .18) emerged as a significant predictor of BMI. In case of female adolescents, Optimism (β= -.18) emerged as a significant predictor of BMI.

Proposed hypotheses were not upheld in this study. However previous research has shown that various dimensions of Positive Mental States were related to Body Mass Index.

Hill and Williams (1988) evaluated the effect of obesity on the psychological health of a non-clinical sample of obese women, also investigated binge eating in this group and examined the predictors of psychological distress. A cross-sectional comparison of women were divided into three obesity groups (BMI) i.e. (30 - 34.9, 35 - 39.9, > 40). It was found that women with the heaviest BMI (i.e. BMI > 40) did not differ on measures of mental health, but expressed the greatest dissatisfaction with their body weight, shape and appearance, and had the lowest self esteem and peer relationships, but not body weight were highly significant negative predictors of poor mental health.
Greeno et al. (1998) tested whether overweight, or perception of lack of control over eating, or both contributed to the level of life satisfaction for women and men in a random sample of community dwelling adults. It was found that for women, both lack of perceived eating control and higher BMI were associated with less life satisfaction and lack of control over eating was the more important predictor. For men, only lack of perceived eating control was associated with less life satisfaction. Furthermore, for both women and men, the contribution of eating control, to life satisfaction was unaffected by BMI, that is the life satisfaction of heavier people was not more effected by perceived control over eating than was the life satisfaction of lighter people.

In another study Williams et al. (1998) assessed personality predictors of mood related to dieting. They found that mood response to dieting is of considerable clinical importance. Negative mood states have been found to relate to dietary lapses (Drapkin et al., 1995) and mental well-being is also associated with motivation to diet (Karlsson et al., 1994).

Renman et al. (1999) studied mental health and psychological characteristics in adolescents obesity. It was found that the obese individuals rated themselves significantly lower in physical characteristics, but in all other aspects of self-esteem, mental health and social and academic competence there were no differences between the two groups. There were significant socio economic differences with more obese adolescents living with only one parent and with mothers of obese adolescents having lower education than those in the control group. This study confirms previous observations that obesity is associated with special socio-economic conditions in youth, but that obese adolescents do not differ from their normal weight peers in other aspects of mental health.

Ball et al. (2004) investigated associations of overweight status and changes in over weight status overtime with life satisfaction and future
aspirations among a community sample of young women. It was found that young women’s aspirations were cross sectionally related to BMI category, such that obese women were less likely to aspire further education. Even after adjusting for current occupation, young women who were obese were more dissatisfied with work/career/study, family relationships, partner relationships, and social activities. Weight status was also longitudinally associated with aspirations and life satisfaction. Women who were overweight or obese at both surveys were more likely than other women to aspire to “other” types of employment (including self-employed and unpaid work in the home) as opposed to full time employment, Women who resolved their overweight/obesity status were more likely to aspire to being childless than other women.

As Regards Positive Mental States And Health Habits it was hypothesized that adolescents’ Health Habits viz. Eating Habits, Exercise Habits, Avoidance of Use of Alcohol and Drugs and Total Health Habits were expected to be positively related with Mental Health dimensions viz. Being Comfortable With Self, Being Comfortable with Others, Perceived Ability to Meet Life Demands and Total Mental Health. It was also expected to be positively related with positive affect, Satisfaction With Life, Generalized Self Efficacy, Health Efficacy, Optimism and Perceived Happiness Status.

A perusal of inter - correlation tables (13, 14, 15) revealed that Eating Habits was positively related to Health Efficacy (r = .17) only in case of the total sample. Again, Eating Habits was positively related to Health Efficacy (r = .27) only in case of male adolescents. In case of female adolescents, Eating Habits was positively related with Being Comfortable with Self (r = .19) (a component of WHO Measure of Mental Health).

Exercise Habits was positively related with Perceived Ability to Meet Life Demands (r = .16), Total Mental Health (r = .16), Generalized
Self Efficacy \((r = .20)\) and Positive Affect \((r = .17)\) in case of total sample. No dimensions of Positive Mental states correlated significantly with Exercise Habits in case of male adolescents. In case of female adolescents, Exercise Habits was positively related to Perceived Ability to Meet Life Demands \((r = .20)\), Total Mental Health \((r = .24)\) and Generalized Self Efficacy \((r = .23)\).

In case of **Avoidance of Use of Alcohol and Drugs**, no significant correlations emerged between it and Positive Mental States dimensions for all the three groups - the total sample, male adolescents and female adolescents.

**Total Health Habits** was positively related with perceived Ability to Meet Life Demands (Component of WHO Measure of Mental Health) \((r = .16)\), Total Mental Health \((r = .14)\), Generalized Self Efficacy \((r = .19)\), Health Efficacy \((r = .13)\) and Positive Affect \((r = .14)\) in case of total sample. Among male adolescents, Total Health Habits was positively related with Health Efficacy \((r = .18)\) only. In case of female adolescents, Total Health Habits was positively related with Total Mental Health \((r = .21)\) and Generalized Self Efficacy \((r = .21)\).

A glance of the Regression tables (27, 28, 29) revealed that for the criterion **Total Health Habits**, none of the dimensions of Positive Mental States emerged as a significant predictor for all the three groups - the total sample, male adolescents as well as the female adolescents.

The above results showed that the hypotheses were upheld and are in consonance with earlier researches.

Self-efficacy represents "beliefs in one's capabilities to organize and execute the courses of action required to produce a given attainment" (Bandura, 1997) and has been a consistent correlate of physical activity among adolescents, including adolescent girls.
Buchanan, et al. (1999) conducted a study on one hundred twenty subjects at risk for depression to assess the impact on physical health following a Cognitive-Behavioural Intervention. The participants were assigned to two groups. One of the groups was given an 8-week, cognitive-behavioural intervention designed to prevent future depression, while the other was a no-intervention control group. The physical health of these participants was assessed 6 to 30 months after entry into the project and it was found that participants assigned to the Cognitive-Behavioural Intervention group reported better physical health than the control group: in the form of fewer self-reported symptoms of physical illness, fewer doctors' visits overall and fewer illness-related visits to health centre. Thus they concluded that learning of antidepressive skills produces better physical health.

In support of Buchanan, et al. (1999) study by Craighead et al. (1999) reported that Cognitive Behaviour Therapy was important in reducing depression, improving health behaviour and Optimism. Thus it may be inferred from the above studies that optimism plays an important role in health behavior and optimism can be increased through training.

Life satisfaction and future orientedness are strongly associated with adolescent adjustment and substance abuse (Diener and Lucas, 2000). As a mechanism this may be crucial in determining the relation between smoking regular alcohol and drug use and adolescents reduced life satisfaction (Zulling et al. 2001).

Valois et al. (2003) studied the relationships among perceived life satisfaction, perceptions of body weight and dieting behaviour in a cross sectional study of public high school adolescents. It was revealed that perceptions of overweight, perceptions of underweight, having dieted to lose weight, having vomited or used laxatives to lose weight and taking diet pills were significantly related (p < 0.05) to reduced life satisfaction for adolescents. Differences in dieting behaviour and perceptions of weight
were demonstrated across gender and race.

Piko et al. (2005) explored the interrelationships among adolescent smoking and certain personal influences (academic achievement, life satisfaction and future-orientedness) and social influences (hostility, social comparison and perceived friends' smoking). It was found that high life satisfaction, academic achievement, future orientedness and social comparison were related to lower rates of smoking. Perceived friend's smoking was a strong influence of adolescent smoking in all samples.

Kelloniemi et al. (2005) assessed the association between optimism and health habits among young adults. It was found that both women and men above the upper quartile for optimism more often ate fresh fruit vegetables and salads, fruits, low fat cheese than those below the lower quartile. Pessimism was associated with infrequent consumption of foods rich in fiber and salad dressing and the proportions of high consumers of alcohol. Proportions of subjects with BMI of 30.0 Kg/m² and above and that of current smokers were higher among the pessimists than among the optimists. Thus lack of optimism is associated with a cluster of unhealthy dietary and other habits.

A possible effect of control beliefs in practice is how one takes care of oneself. Lau (1982) divided practiced health habits along two separate dimensions. Certain behaviors involve self-care, such as brushing one's teeth, getting exercise, getting sufficient sleep and eating a good diet. Other health habits involve utilizing the services of medical professionals, like maintaining regular checkups at a doctor or dentist, or receiving preventive vaccines. It has been identified that practicing a variety of different health habits as a child is associated with optimistic beliefs in the controllability of health, both for beliefs in the efficacy of self-care and of doctors. Peterson et al. (1988) have found that the tendency to adopt a pessimistic explanation of personal misfortune in young adulthood was associated with poor physical health in later life.
BRIEF SYMPTOMS OF DEPRESSION, HOSTILITY, ANXIETY AND BMI AND HEALTH HABITS

It was hypothesized that Adolescents’ BMI was expected to be positively related with Depressive Symptoms, Hostility and Anxiety Symptoms.

A perusal of inter-correlation tables (13, 14, 15) revealed that there were no significant correlation between Brief symptoms of Depression, Hostility, Anxiety and BMI for all the three groups the total sample, male adolescents and female adolescents.

However, a glance of the Regression analysis tables (24, 25, 26) revealed that for the criterion of BMI, Anxiety Symptoms emerged as the significant predictor in case of total sample (β= -.20) and male adolescents (β= -.27). No variable emerged significant in case of female adolescents.

The above results showed that these hypotheses were not upheld but previous research has shown that Brief Symptoms of Depression, Hostility and Anxiety were related to Body Mass Index.

Dujovne and Houston (1991), examined whether lipid levels would be related to cynical hostility, expressive hostility and neurotic hostility. Across both genders expressive hostility was found to be positively related to total cholesterol and low density lipoprotein (LDL). Neurotic hostility was not related to lipid levels for either men or women. Cynical hostility was found to be positively related to LDL in case of men. The results for men are congruent with findings, albeit not consistent, of a relation between cynical hostility and coronary artery disease.

Studies on the psychological correlates and sequele of obesity have usually characterized the relationship between depression and obesity as unidirectional (French et al., 1995; Strous, 2000,; Sheslow et al. 1993).

The social stigmatization associated with obesity is believed to engender chronic embarrassment, shame and guilt, all of which may lead
Rasmond et al. (1996) examined the symptoms of depression and anxiety, sleep disturbances, psychosomatic disease as well as degree of life satisfaction in relation to body mass index (BMI) and the waist/hip circumference ratio (WHR). In univariate analyses both BMI and WHR correlated with these factors. It was also found that in contrast to BMI the WHR is associated with symptoms of depression and anxiety with associated sleep disturbances, as well as psychosomatic symptoms and dissatisfaction.

Suarez (1999) assessed the relations of trait depression and anxiety to low lipid and lipoprotein concentration in healthy young adult women. It was found that in healthy young adult women, low lipid and lipoprotein concentrations are inversely associated with trait measure of depression and anxiety. These findings are independent of age, body mass index, physical activity and other factors known to influence lipid concentrations.

The increasing prevalence of obesity among children and adults is becoming a public health crises. Understanding the social and psychological conditions that are associated with obesity could help predict which children and adolescents are likely to become obese adults, helping physician target treatment and prevention efforts.

Anderson (2003) evaluated the association between anxiety disorders and depression and weight gain from childhood to adulthood. During the study 300 participants (119 men and 191 women) had anxiety disorders and (50 men and 98 women) were depressed. It was found that women with anxiety disorders had significantly higher BMI z scores than women of the same age and socio economic status without the condition. Women with a history of depression were heavier and experienced a greater yearly increase in their BMI scores than women without depression.
Obese persons have been shown to be at greater risk for depression (Roberts et al. 2002), anxiety, low self esteem and poorer social relationships (Hill and William, 1998). However, other studies found that there is no association between body weight and psychological health (Friedman and Brownell, 1995, Han et al., 1998).

Falkner et al. (2001) investigated how past experiences and future aspirations regarding education, financial success, and occupational success varied by weight status. It was found that the prevalence of past negative social, educational and psychological experiences was greatest among those who were obese particularly for women.

Pine et al. (2001) showed that childhood depression was associated with an increased body mass index (BMI) in adulthood. This association persisted after controlling for socioeconomic factors. They also showed that, it provided the strongest evidence to date that depression may be a cause and not just a consequence of obesity.

Goodman and Whitaker (2002) did a longitudinal analysis to see whether depressed mood predicts the development and persistence of obesity in adolescents. It was found that baseline depression was not significantly correlated with baseline obesity. Having depressed mood at baseline independently predicted obesity at follow-up. It shows that depressed adolescents are at increased risk for the development and persistence of obesity during adolescence. It suggests that understanding the shared biological and social determinants linking depressed mood and obesity may inform the prevention and treatment of both disorders.

As regards Brief Symptoms Of Depression, Hostility, Anxiety And Health Habits it was hypothesized that Adolescents' Health Habits viz. Eating Habits, Exercise Habits, Avoidance of Use of Alcohol and Drugs and Total Health Habits were expected to be negatively related with Depressive Symptoms, Hostility and Anxiety Symptoms.
A perusal of Inter-correlation tables (13, 14, 15) revealed that **Eating Habits** was negatively related to Depressive Symptoms ($r = -.22$), Hostility Symptoms ($r = -.23$) and Anxiety Symptoms ($r = -.23$) in case of the total sample. Among male adolescents also, Eating habits was negatively related to Depressive Symptoms ($r = -.23$), Hostility Symptoms ($r = -.27$) and Anxiety Symptoms ($r = -.20$). In case of female adolescents also, again Eating Habits was negatively related to Depressive Symptoms ($r = -.23$), Hostility Symptoms ($r = -.21$) and Anxiety Symptoms ($r = -.25$).

**Exercise Habits** was negatively related to Depressive Symptoms ($r = -.14$) only, in case of total sample. There was no significant correlation in case of male adolescents. In case of female adolescents, Exercise Habits was negatively related to Depressive Symptoms ($r = -.20$) and Hostility Symptoms ($r = -.19$).

In case of **Avoidance of Use of Alcohol and Drugs**, it did not have any significant correlations with Depressive Symptoms, Hostility Symptoms and Anxiety Symptoms in all the three groups i.e, the total sample, male adolescents and female adolescents.

**Total Health Habits** was negatively related to Depressive Symptoms ($r = -.19$), Hostility Symptoms ($r = -.19$) and Anxiety Symptoms ($r = -.13$) in case of the total sample. Among male adolescents, Total Health Habits was negatively related to Depressive Symptoms ($r = -.20$) and Hostility Symptoms ($r = -.23$). Again in the case of female adolescents, Total Health Habits was negatively related to Depressive Symptoms ($r = -.21$) and Hostility Symptoms ($r = -.18$).

A glance of the Regression analysis tables (27, 28, 29) revealed that for the criterion of Total Health Habits, only Hostility Symptoms ($\beta = -.21$) emerged as a significant predictor in the case of male adolescents. No variables emerged significant in the case of total sample and female adolescents.
The above results showed that the hypotheses were upheld and previous research has also shown that Brief Symptoms of Depression, Hostility and Anxiety to be related to different Health Behaviours.

Lingswiler et al. (1987) investigated daily mood fluctuations and moods during eating in normal and overweight binge and non binge eaters and moods during binge and non binge episodes of individuals who binge eat. It was found that binge eaters experience greater fluctuations of anxiety and depression than non bingers and overweight individuals experience greater fluctuations in anxiety, hostility and depression than normal weight individuals. Bingers also experience negative mood states during the binge episodes, although the intensity of the negative affect was not related to the severity of binge eating episode.

Hostility may be a risk factor for poor health among adults, e.g. coronary heart disease, in part through poorer health habits such as smoking (Whiteman et al., 1997). Social relationship, that often involve social comparison could sometimes lead to social strain and conflicts. These interactions might complicate the simple inter-relationships among social comparison, hostility and smoking.

Haase and Prapavessis (1998) examined the relationship between social physique anxiety and eating attitudes in a university population. It was found that, after accounting for social desirability effects, social physique anxiety scores were positively related to disturbed eating attitude scores. In addition both BMI and gender served to moderate the social physique anxiety disturbed eating attitudes relationship. Relations between social physique anxiety and disturbed eating attitudes were maximized for females with lower BMI scores.

Kalaitzi et al. (2003) investigated the relationship between BMI and depression anxiety and nicotine dependence in 18 years old high school students. It was found that smokers mean did not differ significantly from
that of non smokers. Underweight students mean scores on trait subscale of STAI (52.38±3.32) was significantly higher (p = 0.016) from that of normal weight students. A similar trend was also noticed in trait anxiety score, yet it did not statistical significance.

Holkkamp et al. (2005) assessed whether depressive, anxious and obsessive - compulsive symptoms persist in truly long term recovered patients of Anorexia Nervosa. It was found that in comparison to healthy subjects, long term recovered patients had higher level of depressive (P = 0.002), anxious (P = 0.006) and obsessive compulsive (P ~ 0.015). In conclusion, depressive, anxious and obsessive - compulsive symptoms may be personality traits in subjects with former adolescent anorexia nervosa.

FAMILY-adolescent conflict, perceived parental bonding, BMI and health habits

It was hypothesized that Adolescents' BMI was expected to be positively related with Family - Adolescent Conflict and Parental Overprotection and negatively related with Perceived Parental Care.

A perusal of Inter-correlation tables (13, 14, 15) revealed that there were no significant correlations between Family - Adolescent Conflict, Perceived Parental Overprotection, Perceived Parental Care and BMI for the total sample, male adolescents as well as for female adolescents.

Regression Analyses tables (24, 25, 26) also revealed that for the criterion of BMI, Perceived Parental Care emerged as a significant predictor in case of female Adolescent (β=.19) only.

This was contrary to expectations. The proposed hypotheses were not upheld. However, previous research has shown that Perceived Parental Bonding and Family- Adolescent Conflict were related to Health Habits.
Family environment has also been related to the development of body fat and to obesity. Klesges et al. (1992), for example, found that the quality of family relationships was associated with the amount of body fat among preschool children. However, after the investigations controlled for initial body fat, children from more positive family situations had developed less body fat at a 1 year follow up. Gender differences were also important at this time. Greater family support may be associated with more family meals and joint activities which contribute to the girls’ eating more and the boys exercising more.

Uzark et al. (1988) in a study to identify some of the psychosocial barriers to compliance in a hospital based weight control intervention program for adolescents obtained a significant correlation between weight loss outcome and few factors in obese adolescents. Weight loss was significantly associated with their beliefs regarding family problems as a cause of their obesity and perceived willingness of family members to diet. In addition, positive parental attitude or expectation that child was less likely to be overweight in future was associated with greater weight loss compliance. The study clearly depicts the role of family support in weight loss programme.

Felker and Strivers (1994) in their study reported that lower Independence, greater conflict and control were significantly associated with greater eating disorder risk.

Similar to these studies, Pattison (1994) also found that the severity of eating disorder symptoms in the form of frequency of binge eating episodes, entrenchment in dieting and body dissatisfaction increases with the negative perception of family environment. Positive family support as perceived by subjects at intake was significantly related to abstinence from binge-eating at follow-up. A moderate to substantial correlation was found between certain family environment sub scales (Cohesion, Expressiveness, Intellectual-Cultural Orientation, Active

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Recreational Orientation and Organization) and Borderline Symptom Index.

Karen (1995) found that depression and the family variables of Cohesion, Expression, Conflict and Independence did not differentiate the obese and non-obese males.

Yelley (2003) studied the parental use of child feeding practices and outcomes in child and adolescent nutrition. It was found that parents who pressured their children to eat (motivated by concern about the child being underweight) were more likely to have children with lower BMI percentiles and skinfold thickness while parents who monitored or restricted the child's intake had children with higher BMI percentiles and skinfold thickness.

Eley et al. (2004) assessed the predictors of depressive symptoms in adolescents. It was found that the odds for severe depressive symptoms in the adolescent increased by a factor of 1.5 for every increase of 1 SD in parental family vulnerability. It was also found that parental BMI was a significant risk factor for severe adolescent depression.

As Regards Family-Adolescent Conflict, Parental Bonding And Health Habits, It was hypothesized that Adolescents' Health Habits viz. Eating Habits, Exercise Habits, Avoidance of Use of Alcohol and Drugs and Total Health Habits were expected to be negatively related with Family-Adolescent Conflict and Parental Overprotection. It was expected to be positively related with Parental Care.

A perusal of inter correlation tables (13, 14, 15) revealed that Eating Habits was negatively related with Family - Adolescent Conflict ($r = -.18$) in case of total sample. In case of male adolescents also, Eating Habits was negatively related with Family - Adolescent Conflict ($r = -.31$). No significant correlation were found in case of female adolescents.

Exercise Habits did not show any significant correlation with Family - Adolescent Conflict and parental Bonding in all the three groups the total sample, male adolescents and female adolescent and female adolescents.
Avoidance of Use of Alcohol and Drugs did not show any significant correlation with Family -Adolescent Conflict and Perceived Parental Bonding in all the three groups - the total sample, male adolescents and female adolescents.

Total Health Habits did not show any significant correlation with Family - Adolescent Conflict and Perceived Parental Bonding in all the three groups :-the total sample, male adolescents and female adolescents.

A glance of the Regression analysis tables (27, 28, 29) revealed that for the criterion Total Health Habits, no variables of Perceived Parental Bonding and Family - Adolescent Conflict emerged as a significant predictors in all the three groups viz. the total sample, male adolescents and female adolescents.

The above results showed that the hypotheses were only partially upheld.

Many previous researches have shown that Perceived Parental Bonding and Family Adolescent Conflict were related to Health Habits.

Parents are important agents of socialization training in children (Maccoby and Martin, 1983), Parent-child interactions are likely to contribute to the development of children's relational schemas and scripts. Crick and Dodge (1994) suggested that the origins of social cognitive heuristics involved in social information processing are likely to include past social interactions with parents.

Research into childhood aggression provides strong evidence that negative family environment, difficult child temperament and hostile biased social cognitions are repeatedly associated with aggressive behavior in children (Crick and Dodge, 1994). Recently, researchers have begun to examine the role of latent mental structures, such as social knowledge of past negative social experiences and normative beliefs, in childhood
aggression (Zelli et al., 1999) which in turn is related to health behavior and eating patterns.

Powers (1980) believed that resistance to changing food habits is related to child rearing practices. If food was intimately associated with warmth and loving, food comes to symbolize affection, and any change in food habits is difficult.

In a study by Thienemann and Steiner (1993), families of young children with eating disorders were compared to normative group. In this study, irrespective of the specific type of eating disorders, girls who were more depressed described their families as lower on support, independence, recreational orientation, and organization and higher on control.

Healthy adolescent development unfolds within a family context of balanced autonomy and attachment (Thieneman and Steiner, 1993).

Baumrind (1987) theorized that parents who are either too restrictive or permissive or too detached or involved, will engender problems in the developing adolescents. Such imbalanced parenting styles instill conflict, rebellion, immortality, and personal inadequacy in the adolescent.

Three parental variables which are associated with adolescents' substance use are parental attachment, bonding or emotional support (Lattimore et al. 1995); Parental monitoring and Parental substance use.

Ratti et al. (1996) compared perceived relationships and interaction patterns among 44 families with externalizing (polydrug - dependent) internalizing (bulimic) or normal adolescent daughter. Results revealed that families of polydrug dependent girls were less well attached and less autonomous than were families of daughters with bulimia who were, in tum less attached and autonomous than controls.

Fariburn et al. (1997) studied the risk factors for bulimia nervosa and identified negative self-evaluation and parental variables as
distinguishing women with bulimia nervosa from psychiatric comparison subjects.

While bulimia nervosa has been shown to run in families, which shows a genetic influence, the differences in the results of the twin studies must be the result of environmental influences including parental influences (Martin et al., 1997).

The stronger the family bond, the less likely adolescents were to drink or take drugs (Lattimore et al, 1995). Knight et al. (1998) conducted a study on opium addicts and parenting, suggested that self-control had a mediating effect on substance use, in which lower levels of parental social support affected adolescent substance use via the acquisition of anti social attitudes.

Flannery et al. (1999) found that adolescents who were left alone without parental or adult supervision were four times more likely than those at home with a parent to have used drugs or alcohol in their lifetime.

Wade et al. (2001) investigated difference between twins in nine pairs of female monozygotic twins who were discordant for lifetime bulimia nervosa. The affected twins reported significantly lower self-esteem and less warmth but more overprotection by their mothers during childhood.

Barrera et al. (2001) reported that parental monitoring significantly predicted adolescent problem behaviour, including substance use. Brook et al. (2001) found that positive parental monitoring, in the form of father's discipline, decreased the odds of adolescent drinking and drug use.

Hale et al. (2005) examined the association of perceived parental rejection to adolescent depression and aggression. It was reported that perceived parental rejection, mediated through adolescent depression, explains aggressive behaviours of adolescents. Further analysis also revealed that these effects are also somewhat dependent on the gender and the age of the adolescents.
Chapple et al. (2005) studied the direct and indirect effects of parental bonds, parental drug use, and self control on adolescent substance use. It was reported that parental factors would indirectly affect youth's substance use via self-control. It was also found that parental monitoring and maternal marijuana use have additional direct effects on adolescent substance use. High self control was significantly associated with high maternal attachment, high parental monitoring and sex (girls have higher levels of self control).

Petronyte and Zaborskis (2006) assessed the disciplinary styles for parental upbringing with respect to problem health behaviour (smoking, alcohol and drugs use etc) in adolescents. Four types of styles were studied. They were (i) reciprocal (ii) indulgent (iii) repressive and (iv) neglectful. It was found that a low rate of problem behaviors were observed among students educated by parents in reciprocal and indulgent styles, while a high rate of problem behavior were identified among students fallen under repressive and neglectful style of upbringing. There were no significant relations between parental style of upbringing and smoking by the children.

FAMILY PATTERNS (SIBLINGS' AND PARENTAL BMI AND HEALTH HABITS) AND ADOLESCENTS’ BMI AND HEALTH HABITS

It was hypothesized that Adolescents' BMI was expected to be positively related with Siblings' BMI and Parental BMI.

A perusal of bi-variable correlation tables (16-23) revealed the following outcomes.

No significant correlation emerged between BMI of male adolescents and their mothers.

No significant correlation emerged between BMI of male adolescents and their fathers.
No significant correlation emerged between BMI of female adolescents and their mothers.

No significant correlation emerged between BMI of female adolescents and their fathers.

No significant correlation emerged between BMI of male adolescents and their brothers.

There was a significant and positive correlation between BMI of male adolescents and their sisters' BMI (r = .41).

A significant positive correlation was found between BMI of female adolescents and their brothers' BMI (r = .48).

A significant positive correlation also emerged between BMI of female adolescents and their sisters' BMI (r = .25).

The above results show that these hypotheses were upheld for the siblings group only, but not in case of parents.

However previous research has shown many intra-familial correlations between parents and their children's Body Mass Index.

Not all obese infants become obese children, and not all obese children become obese adults. However, the prevalence of obesity increases with age among both males and females (Lohman, 1987) and there is a greater likelihood that obesity beginning even in early childhood will persist through the life span (Epstein et al., 1987).

The risk of becoming obese is greatest among children who have two obese parents (Dietz, 1983). This may be due to powerful genetic factors or to parental modeling of both eating and exercise behavior, indirectly affecting the child's energy balance. One half of parents of elementary school children never exercise vigorously (Ross and Pate, 1987).

Heredity has recently been shown to influence fatness, regional fat distribution, and response to overfeeding. (Bouchard et al. 1990). In
addition, infants born to overweight mothers have been found to be less active and to gain more weight by age three months when compared with infants of normal weight mothers, suggesting a possible inborn drive to conserve energy (Roberts et al., 1988).

Theoretically, children of obese parents are at greater risk of becoming obese because of both shared genetic factors and within family environmental factors. Parental obesity has generally been found to prospectively predict onset of offspring obesity in adulthood (Whitaker et al., 1997). Parental body mass also has predicted future increases in offspring body mass during childhood, but this effect was not replicated in one study of adolescents.

A review of epidemiological studies in Europe and the Unites States of the relation between obesity in childhood and subsequently in adulthood reported that the risk of adult obesity was at least twice as high for obese children as for non obese children (Serdula et al., 1993).

When the relationship between parents and children's overweight status were studied, it was found that an increase in the risk of children being overweight as adults if both parents were overweight (WHO, 1998., Lake et al., 1958., Whitaker et al., 1997). The British and American studies found an increased risk when only one parent was over weight.

Whitaker et al. (2000) examined the association between children's adiposity and their parents' eating behavior and body mass index (BMI) to better understand risk factors for the development of obesity in early childhood. It was found that 26% percent of parents were obese (BMI ≥30 kg/m²). Both maternal and paternal BMI were associated with higher scores for disinhibition (r = 0.69 and r = 0.68, p < 0.001), and maternal BMI was also associated with higher scores for hunger (r = 0.51, p < 0.001). There were no significant relationships between children's percentage body fat and parent eating scores, and the correlation between children's percentage body fat and parent BMI was significant only between mothers
and daughters $r = 0.35, p = 0.04)$. Obese parents were no more likely to have a child who was fatter (upper quintile of percentage body fat for gender).

Burke et al. (2001) investigated the associations between body mass index (BMI) and family characteristics, including lifestyle, in parents and offspring from Australian families. It was found that BMI was predicted negatively by physical fitness, and positively by alcohol intake in sons while, in daughters only a negative association with physical fitness was significant. When parental characteristics were included, BMI in 18 years old sons and daughters was significantly predicted by mothers and fathers’ BMI, independently of offspring’s alcohol intake, smoking, physical fitness and parent’s education; and in daughters, by father’s alcohol intake. These models explained 48% of variance in daughters and 33% in sons. In both sons and daughters BMI over the 9 year of the survey was consistently higher in offspring with overweight or obese fathers or mothers. Physical fitness at the ages of 12, 15 and 18 was negatively related to fathers’ obesity in daughters and mothers obesity in sons. Obesity in fathers was associated with a four fold increase in risk of obesity at the age of 18 years in both sons and daughters with an independent right fold increase in risk for daughters if mothers were obese.

Williams (2001) examined the association between BMI in childhood and adolescence and parents BMI and being overweight at age 21. It was found that the point on the BMI distribution where the probability of being overweight at age 21 was 0.5 was close to the 75th centile for boys throughout childhood and adolescence. It was rather higher for girls in childhood but similar in adolescence. Boys with a BMI above the 75th centile at age 7 were more than 4.0 times more likely to be overweight at age 21. having overweight parents particularly a mother, increased the likelihood of being overweight.

Davison and Birch (2001) assessed predictors of change in girls’ body mass index (BMI) between ages 5 and 7 y and familial aggregation of
risk factors associated with childhood overweight. It was found that the most effective model predicting girls' change in BMI between ages 5 and 7 included both child and parent characteristics, specifically girls' BMI at age 5, mothers' change in BMI, fathers' energy intake, fathers' enjoyment of activity, and girls' percentage of energy from fat. In addition, results showed substantial intra-familial associations in weight status and dietary intake and to a lesser extent physical activity, and the presence of multiple risk factors within families. Associations were also noted between girls' and parents' change in BMI. Results from this study highlight the centrality of the family in the etiology of childhood overweight and the necessity of incorporating parents in the treatment of childhood overweight.

Stienle et al. (2002) investigated the genetic underpinnings of eating behaviour as eating behaviour and dietary intake affect the development of obesity related diseases, such as diabetes, hypertension and hyperlipidemia. For this purpose a standardized eating behaviour inventory was administered. Three quantifiable components of eating behaviour were measured between eating behaviour scores and physical characteristics were also evaluated. Heritability analysis and genomewide multipoints linkage analysis were performed. It was found that eating behaviour scores were associated with obesity related phenotypes. The linkage analysis showed four regions of suggestive linkages. A suggestive evidence for linkage of restraint scores to two chromosomal regions were observed. The findings also suggested that this behavioural phenotype may be secondary to obesity effects on eating behaviour and suggestive effects on eating behaviour and suggestive genetic linkage were found in amish adults.

Danielzik et al. (2002) investigated that impact of parental BMI on the manifestation of overweight in 5 to 7 year old children. The results showed that BMI of the children was significantly correlated with parental BMI. Children's BMI showed closer associations with maternal than with
paternal BMI. A multivariate regression analysis showed that parental BMI explained 7.6% of the variance in children's BMI.

Wang et al. (2002) assessed the association between overweight or obesity and household income and parental body mass index in Australian Youth. It was reported that the odds ratio of overweight or obese boys with highest household income was significantly smaller than those with the lowest household income. The proportion of combined overweight and obesity in children whose parents were overweight or obese was significantly greater compared with those whose parents were not. The trend of increasing prevalence of overweight or obesity among children with increasing parental body mass index (BMI) was significant after adjusting for age except the trend of father's BMI for boys.

Margarey et al. (2003) investigated obesity in early adulthood from childhood and parental obesity. It was found that weight status at an earlier age was a more important predictor of weight status at 20 years than parental weight status, and risk of overweight at 20 years increased further with increasing weight status of parents.

Magarey et al. (2003) tracked the degree of adiposity from childhood to early adulthood, and the risk of overweight in early adulthood associated with overweight in childhood and parental weight status in a cohort of children born in the mid 1970s. It was found that the prevalence of overweight/obesity increased with age and was higher than that reported in international reference populations. Weight status at an earlier age was a more important predictor of weight status at 20 years than parental weight status, and risk of overweight at 20 years increased further with increasing weight status of parents.

Danielzik et al. (2004) tried to identify the major risk factors of overweight and obesity in prepubertal children. It was reported that in univariate analysis, family environment - and development related determinants showed some relations to over weight and obesity. In
multivariate analysis, parental overweight, a low SES as well as high birth weight were the strongest factors. Additionally, parental smoking and single households were risk factors for boys, whereas a low activity was associated with obesity in girls.

Ramos de Marins et al. (2004) assessed the association between overweight parents and overweight children/adolescents. It found that 20.7% of girls and 26.9% of boys were overweight, with a larger prevalence among children aged less than 9 years. In addition to maternal BMI, the predictors of overweight children and adolescents were age gender and the number of people in a house. The results demonstrated the relationship between maternal nutritional status and overweight children and adolescents, suggesting and obesity-prevention programmes should be focused on the family.

Previous reports have found associations between having been breast-fed and a reduced risk of being overweight. These associations may be confounded by sociocultural determinants of both breast-feeding and obesity. Gillman et al. (2006) addressed this possibility by assessing the association of breast-feeding duration with adolescent obesity within sibling sets. Mean +/- standard deviation breast-feeding duration was 6.4 +/- 4.0 months, and crude prevalence of overweight was 19%. On average, siblings who were breast-fed longer than their family mean had breast-feeding duration 3.7 months longer than their shorter-duration siblings. The adjusted odds ratio (OR) for overweight among siblings with longer breast-feeding duration, compared with shorter duration, was 0.92 (95% confidence interval = 0.76-1.11). In overall analyses, the adjusted OR was 0.94 (0.88-1.00) for each 3.7-month increment in breast-feeding duration. It was concluded that the estimated OR for the within-family analysis was close to the overall estimate, suggesting that the apparent protective effect of breast-feeding on later obesity was not highly confounded by unmeasured sociocultural factors.
As regards Siblings' Health Habits, Parental Health Habits and Adolescents' Health Habits, it was hypothesized that Adolescents' Health Habits viz. Eating Habits, Exercise Habits, Avoidance of Use of Alcohol and Drugs and Total Health Habits were expected to be positively related with Siblings' (brothers and sisters) Health Habits and Parental Health Habits.

A perusal of bivariate correlations tables (16 -23) revealed the following results.

A perusal of bivariate correlations table (Table 16) showed that significant positive correlations were found between male adolescents and their mothers' Exercise Habits \( (r = .37) \) and Total Health Habits \( (r = .31) \).

A perusal of bivariate correlations table (Table 17) showed that significant positive correlations were found between male adolescents and their fathers' Eating Habits \( (r = .23) \) and Exercise Habits \( (r = .18) \).

A perusal of bivariate correlations table (Table 18) showed that significant positive correlation were found between female adolescents and their mothers' Eating Habits \( (r = .27) \), Avoidance of Use of Alcohol and Drugs \( (r = .32) \) and Total Health Habits \( (r = .26) \).

A perusal of bivariate correlations table (Table 19) showed that no significant positive correlation was found between female adolescents and their fathers.

A perusal of bivariate correlations table (Table 20) showed that there was a significant positive correlations between male adolescents and their brothers' Eating Habits \( (r=.51) \), Exercise Habits \( (r = .39) \) and Total Health Habits \( (r = .50) \).

A perusal of bivariate correlations table (Table 21) showed that there was a significant positive correlation between male adolescents and their sisters' Eating Habits\( (r = .30) \).

A perusal of bivariate correlations table (Table 22) showed that
significant positive correlations were found between female adolescents and their brothers' Eating Habits \( (r = .34) \), Avoidance of Use of Alcohol and Drugs \( (r = .38) \) and Total Health Habits \( (r = .37) \).

A perusal of bivariate correlations table (Table 23) showed that significant positive correlations were found between female adolescents and the sisters' Eating Habits \( (r = .49) \), Exercise Habits \( (r = .38) \) and Total Health Habits \( (r = .32) \).

The above results showed that proposed hypotheses were upheld.

Previous research has shown many intra-familial correlations between parents and their children's Health Habits.

Godin et al. (1986) studied children's perception of parental exercise and related them to self reported parents habits of exercise and the children own activity patterns. It was found that congruence between the children's perceptions and the self reported exercise habits of the opposite - sex parents differed for boys and girls, increasing for boys and decreasing for girls between grades 7 and 9. No significant associations were observed between the children's perception of parental exercise patterns and their own like habits. This suggests that during adolescence parental influences are minimized by other factors, personal or environmental.

Sallis et al. (1988) examined the familial aggregation of physical activity in Mexican American and Anglo families. The results indicated a moderate degree of aggregation of physical activity in both samples, and adjustment for body mass index was inconsequential. Intra family correlations tended to be higher in Mexican - American. Mother - child correlations usually were higher than father - child correlations. These findings support the hypothesis that the family is a significant influence on physical activity.

Parental exercise habits and encouragement influence children's exercise habits (Sallis, 1992) but not all agree with this findings (Aarnio et al., 1997).
Bradley et al. (1993) assessed attitudes toward exercise in middle school age children and examined its relationship with children's fitness, self reported physical activity and body mass index. It was found that attitude towards exercise was correlated with physical activity and fitness. It was weakly but significantly negatively related to body mass index ($r = -0.14$).

Mc Murray et al. (1993) assessed the effect of parental attitudes and self reported exercise habits on the fitness and activity levels of their children. It was found that the children's self reported activity scores were not correlated with parents attitudes or exercise habits. It suggests that factors other than parental attitudes and exercise habits are more influential in determining the fitness and activity levels or exercise habits of children.

The relation of lifestyle factors and social and environmental conditions to adolescent physical activity patterns is insufficiently understood. However, cross sectional studies of adolescents show that smoking is associated with low physical activity (Yang, 1999).

Longitudinal studies of physical activity show that many lifestyle social and environmental factors may predict consistent physical activity. These include non smoking (Yang, 1999) lower consumption of saturated fatty acids, higher school grades and participation in organized sports as well as social relationships, parents interests in physical activity and very good self assessed health (Dovery, 1998).

Parents play a central role in shaping a family eating environment, which provides a context for the child's early eating experience (Birch and Fisher, 1998). Parents' feeding attitudes and practices shape what foods the child is offered, exert control over the timing, size and social context of meals and snacks and set the emotional tone of eating occasions. Birch and Fisher (2000) have found that child-feeding practices have clear effects on the child's emerging food preferences, intake patterns and
developing self-regulation of food intake. More recently evidence has been
gathered linking parents' child-feeding practices to their children's weight
status. Taken together, these findings stress the potential importance of
parents' child-feeding practices on their children's food acceptance
patterns and have led to hypotheses that child-feeding practices might be
implicated as an environmental factor in childhood obesity (Birch and

Roan (2000) stated that teens closely model their parents health
habits regarding smoking, eating and exercise. Even more impressive was
the finding that teens will not pick and choose which of their parents habits
to model and instead tend to mimic their overall "health - risk lifestyle".
Thus, if parents had several poor health habits, the teen would tend to
emulate those habits as well conversely, extremely healthy parents tended
to have extremely health conscious teens. Boys tended to follow their
fathers examples while girls repeated their mothers habits.

Sallis et al. (2000) studied the correlates of physical activity of
children and adolescents. It was found that among adolescents, variables
which consistently associated were, perceived activity competence, parent
support, direct help from parents, sibling physical activity, opportunities to
exercise and depression (inverse).

Burke et al. (2001) investigated the associations between body
mass index (BMI) and family characteristics, including lifestyle, in parents
and offspring from Australian families. It was found that alcohol intake in
sons related significantly to alcohol intake in either parent, while for
daughters, there was significant association only with father's alcohol
consumption. In daughters fat intake was positively associated with fat
intake score in both fathers and mothers.

Aarnio et al. (2002) examined the association between leisure time
physical activity over a three year period and health related behaviour,
social relationships and health status in late adolescence as part of a
nationwide longitudinal study. It was found that in both the sees, smoking irregular breakfast eating attending vocational school and poor self perceived current health were significantly associated with persistent inactivity. Persistent physical inactivity in adolescents is associated with a less healthy lifestyle, worse educational progression, and poor self perceived health.

**White et al. (2004)** process variables in a weight loss program for African - American adolescent girls. It was found that for weight loss among adolescents, parent variables pertaining to life and family satisfaction were the strongest mediating variables. For parental weight loss, changes in dietary practices over the course of 6 months were the strongest mediators.

**Whitaker et al. (2000)** examined the association between children’s adiposity and their parents’ eating behavior and body mass index (BMI) to better understand risk factors for the development of obesity in early childhood. It was found that 26% percent of parents were obese (BMI ≥30 kg/m²). Both maternal and paternal BMI were associated with higher scores for disinhibition (r = 0.69 and r = 0.68, p < 0.001), and maternal BMI was also associated with higher scores for hunger (r = 0.51, p < 0.001). There were no significant relationships between children’s percentage body fat and parent eating scores, and the correlation between children’s percentage body fat and parent BMI was significant only between mothers and daughters (r = 0.35, p = 0.04). Obese parents were no more likely to have a child who was fatter (upper quintile of percentage body fat for gender).

**Kalakanis et al. (2001)** investigated the level and pattern of moderate-to-vigorous physical activity (MVPA) in obese children, examining predictors of their activity. Children and their parents wore accelerometers for several days and provided demographic data. Parental activity levels significantly and independently predicted and improved the
prediction of children’s physical activity levels and number of bouts of MVPA (but not duration of MVPA). (SM)

Davison et al. (2003) examined (a) parents’ activity-related parenting strategies and similarities and differences in such strategies for mothers and fathers, and (b) links between activity-related parenting strategies and girls’ physical activity patterns. Exploratory and confirmatory factor analysis identified two factors for each parent including logistic support of girls’ activity (i.e., enrolling girls in sports and driving them to events) and parents’ explicit modeling (i.e., the extent to which parents used their own behavior to encourage their daughters to be active). Mothers reported significantly higher levels of logistic support than fathers, whereas fathers reported higher levels of explicit modeling than mothers. Although mothers and fathers tended to report different methods of support, both methods were associated with higher physical activity among girls. Finally, girls reported significantly higher levels of physical activity when at least one parent reported high levels of overall support in comparison to no parents; no significant differences were identified for support from one versus two parents. Results from this study indicate the positive contribution that parents can have on activity practices of their young daughters.

Cleland et al. (2005) reported that parental exercise was positively associated with children’s extracurricular sports participation.

Christakis, (2007) professor of medical sociology at Harvard Medical School and professor of sociology in the Faculty of Arts and Sciences, examined the prevalence of obesity among 5,124 children and also their immediate social networks — family and friends they know directly — and in those once and twice removed from them. The results show obesity clusters with the highest chances of weight gain among those who mutually describe each other as friends. Same-sex friends had a greater effect on each other than different-sex friends. “Men are much more influenced by weight gain in men and women influenced
by weight gain in women,” Christakis said. “Sibling effects exist and weight gain in same-sex siblings are more important than those in different-sex siblings.”

Lesser but still significant effects are seen between spouses, different-sex friends, and different-sex siblings. Because study participants wrote down who their friends were independently, not all friendship relationships within the study were mutual. This provided a chance to examine the directionality of friendships. In cases where a person said another was a friend, weight gain in that friend influenced the person. But in cases where a person was named a friend by someone they did not name as a friend, weight gain in the naming person had no effect on the friend, Christakis said.

According to Christakis, professor of medical sociology at Harvard Medical School and professor of sociology in the Faculty of Arts and Sciences, the study also indicates that social distance, not physical distance, is important. While obesity in friends and family has an effect, the study showed that there was no effect from weight gain by unrelated neighbors. Nor, he said, were there geographic effects such as proximity to fast-food restaurants (Powell, 2007).

GENDER DIFFERENCES

To test the hypotheses that gender differences are expected to emerge on the measured variables t-test was applied. The t-ratio table, (Table 12) revealed that male adolescents and female adolescents differed on some of the measured variables.

T-ratios between male and female adolescents emerged significant on Eysenckian Personality dimensions of Extraversion (t = 2.15, female adolescents> male adolescents) and Lie Scale (Social Desirability) (t = 2.75, female adolescents> male adolescents). t- ratios also emerged significant on Personality dimension of Health Locus of Control - External (t= 2.19, female adolescents> male adolescents).
Among the dimensions of Stress and Coping, t-ratios emerged significant on Life Event Stress \( (t = 4.17, \text{ male adolescents} > \text{ female adolescents}) \)

Among Anger dimensions, t-ratios emerged significant on Anger Control \( (t = 2.28, \text{ male adolescents} > \text{ female adolescents}) \)

\( \text{and Total Anger Expressed} \ (t = 2.12, \text{ female adolescents} > \text{ male adolescents}) \).

\( t \)-ratios emerged significant on Health Habits viz. Eating Habits \( (t = 2.16, \text{ male adolescents} > \text{ female adolescents}) \)

Exercise Habits \( (t = 5.37, \text{ male adolescents} > \text{ female adolescents}) \)

Avoidance of Use of Alcohol and Drugs \( (t = 4.82, \text{ female adolescents} > \text{ male adolescents}) \)

Total Health Habits \( (t = 2.88, \text{ male adolescents} > \text{ female adolescents}) \).

\( t \)-ratios also emerged significant on Perceived Health Status \( (t = 2.65, \text{ male adolescents} > \text{ female adolescents}) \).

\( t \)-ratios did not emerged significant on various indices of Positive Mental States, Depression, Hostility and Anxiety.

\( t \)-ratios did not emerged significant on Family - Adolescent Conflict and Parental Bonding.

\( t \)-ratios emerged significant on BMI \( (t = 2.07, \text{ male adolescents} > \text{ female adolescents}) \).

Many earlier studies have reported gender differences in various psychosocial dimensions.

**PERSONALITY AND GENDER DIFFERENCES**

In the present study significant gender differences were found on the Eysenckian Personality dimension of Extraversion and Lie Scale (Social Desirability) with females scoring higher than the male adolescents. \( t \)-ratios also emerged significant on Personality dimension of Health Locus of Control - External with female adolescents scoring higher than the male adolescence.
adolescents.

An earlier study also reported females to score higher on Extraversion than males (Corulla, 1989 and Kaur 2002). In contrast, Mohan and Gulati (1989) and Moudgil (1998) found males to be higher on Extraversion than females. On Eysenckian Personality dimension of Lie Scale (Social Desirability), Eysenck and Haapasalo (1989), Francis (1991) and Hanin et al. (1991) reported females to score significantly higher than males.

The findings that girls scored higher than boys on Extraversion is inconsistent with some of the earlier researches. However this is supported by some studies on adolescents, Home Science students, smokers, drug addicts, nurses and Youth Workers (Mohan et al., 1987, Mohan and Sehgal 2002) The higher scores on Extraversion obtained by the girls in the present study and some earlier researches could be explained in terms of higher age matched spurt in maturity of girls than boys.

Mc Guiness et al. (1974) conducted a study to identify gender differences in perceived Locus of Control among students in five countries viz. Australia, Japan, New Zealand, United States and Sweden, and found that females had a higher belief in externality than males.

Dyal (1984) reviewed the cross-cultural literature on gender differences in locus of control. Women have been found to be more external than men in a number of studies. Hui (1982) reported that men were more internal than women.

Doherty and Baldwin (1985) found that Locus of Control among women was shifting from internality in 1960's to externality in the decade of 1970's.
Arora (1990) reported that regarding the gender differences on Eysenckian Personality Dimensions, it was found that on the dimension of Psychoticism, males scored higher and on Neuroticism, females scored higher. The same finding was also reported by Mohan and Virdi (1985), Bhandari and Sarup (1987), Mohan and Gulati (1988, 1989).

Kaur (2002) examined the various Personality dimensions (viz. Eysenckian Personality Dimensions and Health Locus of Control) to see if any significant gender differences emerged on these variables. It was found that a significant difference emerged on Psychoticism (boys scored higher than the girls) and Extraversion (girls scored higher than the boys). However, on the other two dimensions viz. Neuroticism and Lie Scale (Social Desirability), no gender differences emerged. Significant differences were also found in case of Health Locus of Control External, with females scoring higher than the males.

Sehgal (2003) reported that significant gender differences emerged regarding the Eysenckian Personality Dimensions i.e. Psychotisism (boys scored higher than girls), on Neuroticism and Social Desirability (girls scored higher than boys) and on Extraversion (girls scored higher than boys).

Shourie (2003) hypothesized that different dimensions of Personality would play a significant role in discriminating between the males and females belonging to good and poor control diabetic group. It was found that on the dimension of External Health Locus of Control, good control males scored higher, on Extraversion and social Desirability, good control males scored higher, and on state and trait anxiety again, good control males scored higher.
In the present study significant gender differences were found on Life Event stressors, with males group scoring higher the females. Similar findings were also reported by Kaur (2002) and Sowa and Lustman (1984), with men reporting of experiencing more stressful life events than women.

However, several researchers have opined that adolescent boys and girls differ in their experience of stress.

It was found that women show greater psychological reactivity to stress (Mirowsky and Ross, 1995; Kudielka et al., 1998), and a greater propensity for depression (Piccinelli and Wilkinson, 2000). Men, on the other hand, show greater physiological reactivity to stress (Flinn, et al., 1996,) and greater usage of negative health behaviours (e.g smoking and alcohol usage, aggressive behaviours) (Aneshensel et al., 1991;Pearlin, 1989). Females reported higher rates than did males for hassles and for stressors. There were no significant sex differences in any other measures although females tended toward higher scores on all scales (weeks et al., 2005).

When studies regarding the sex differences in health were investigated, women often report greater morbidity (i.e. have higher negative health reports), but men consistently have greater mortality rates (Nathanson, 1977; Verbrugge, 1985). With regard to the association among stress, depression, and health, some studies indicate that women are more vulnerable to the physiological ramifications of psychological stress than are men (Handa et al., 1994). However, others suggest greater vulnerability in men (Benyamini et al., 2000).

Trang et al. (1996) measured ethnic and gender differences in reported stressful life events in 70 Southeast Asian adolescents. It was found that females reported higher stress on 8 out of 10 life events than did males. Personal pressure to get good grades had the highest...
percentage mean for females. For males, worrying about where to live or getting a job after graduation were the two most endorsed stressful life events.

Gysbers van Wijk and Kilk (1997) reported that women report more physical complaints than men. The higher symptoms score in women can be explained with the symptoms perception model. Women have more negative affectivity, more selective attention for their bodies and less distraction from the surroundings, which enhances somatization.

Kaur (2002) reported that on various dimensions of Perceived Stress and Strain, significant gender differences were found, i.e. on Presumptive Stressful Life Events, Daily Hassles and Stress Symptoms, males were found to score higher than females.

Sehgal (2003) compared teenage boys and girls on Health status and its correlates in terms of Life Event Stress and Stress Symptoms. It was found that gender differences emerged on Life Event Stress with boys reporting higher Stressful Life Events than girls. No significant differences were reported for Stress Symptoms.

Shourie (2003) hypothesized that stress and its dimensions would play a significant role in discriminating between the Good and Poor Control Diabetic Males and Females. It was found that good control diabetic males (GM) and females (GF) showed significant differences between the two groups on the dimensions of Stress viz. General Health Questionnaire (GHQ), Stress Symptoms (SS) with GF (Good control Females) scoring higher than the males, and Stressfulness of Life Events with Good Control Males scoring higher than the females.

No gender differences emerged in case of Coping dimensions, however some earlier studies showed significant gender differences.

Shourie (2003) hypothesized that Ways of Coping would play a significant role in discriminating between the good and poor control diabetic male and female groups. It was found that on the dimensions of
Confronting Coping, Self Control, Seeking Social Support, Accepting Responsibility and Positive Reappraisal. Good Control Diabetic females scored higher than the Good Control Diabetic Males.

ANGER DIMENSIONS AND GENDER DIFFERENCES

In the present study, it was found that significant gender differences emerged on Anger Control with male adolescents scoring higher than the female adolescents. It was also found that female adolescents were higher on Total Anger Expression dimension in comparison to males.

Regarding the gender differences on Anger Dimensions, Yarchiski et al. (2002) examined sex differences in anger in early adolescents and examined the relationship between anger and several health variables e.g. current health status, clinical health, eudemonistic health for boys and girls separately. The findings indicated that boys and girls did not differ in the experience and expression of anger, but on the health variables, statistically significant differences were found i.e. out of 30 relationships examined, 7 correlations were found for girls and 5 correlations were found for boys. This shows that the health outcomes may differ in relation to various types of anger.

Harris and Bonhoff (1996) investigated how gender influenced aggressiveness. They surveyed 115 male and female college students. Participants were administered the Buss Perry Aggression Questionnaire and asked about their aggressive behaviour. Men scored significantly higher than women on the Physical Aggression Scale of Aggression Questionnaire but not on the other scales.

Sehgal (2003) reported that significant gender difference emerged on State Anger, with boys group scoring higher than the girls group.

Shourie (2003) hypothesized that Anger experienced and Anger Expressed would play a significant role in discriminating between the good and poor control diabetic male and female groups. It was found that on
Trait Anger dimension, good control males scored higher and, on Anger Control dimension, good control females scored higher.

HEALTH HABITS, PERCEIVED HEALTH STATUS AND HEALTH PROTECTIVE BEHAVIOR AND GENDER DIFFERENCES

In the present study it was found that male adolescents scored higher than female adolescents on their Eating Habits, Exercise Habits and Total Health Habits. In case of Avoidance of Alcohol and Drug Use, female scored higher. Significant gender differences were also found in case of Perceived Health Status, with male adolescents group scoring higher than the female adolescents.

Researchers have also reported gender differences in health habits of adolescents.

Gender is a highly significant variable in that women eat more healthy foods, drink much less alcohol, smoke less; visit doctors, more often for preventive care, wear seatbelts more frequently when they drive, and with the exception of exercise, have more healthier lifestyle overall than men (Abel et al. 1999; Blaxter 1990; Cockerham 2000). Furthermore, in adolescence, males tend to adopt the health lifestyles of their fathers and females those of their mothers, thereby establishing the parameters for the gender specific transmission of health lifestyles into adulthood. Whereas gender is an especially powerful predictor of health lifestyles, its effects can also be moderated by distinctions between classes. There is evidence that people on the higher rungs of the socio economic ladder, regardless of gender, participate more in leisure - time exercise, eat healthier foods and smoke less (Adonis and Pollard 1997). This is seen in research in the United Stated, where Ford et al. (1991) found that lower class women were exceedingly less likely to engage in physical activity (other than housework) than higher strata women or males generally.
In Britain, Calnan (1987) found that middle class women placed a
greater emphasis on the need for a balanced diet high in fiber and low in
fats and carbohydrates, working class women were significantly more likely
to insist on substantial meals containing meat and two vegetables.

Alexander (1989) examined gender differences in the reported
health concerns, self assessed health status and illness behaviours of
young adolescents. It was found that for girls, emotional and social
concerns were highly associated with poorer perceived health, while for
boys, physical concerns differentiated those in fair or poor health from
those who saw themselves as healthy.

Heaven (1996) explored the relationship between health risk taking
behaviour and delinquent behaviour among 296 undergraduates. Females
were significantly less involved in delinquent behaviour and registered
lower attraction to thrill seeking and higher degrees of self-control and
socialization, compared with males. Males who measured high in thrill
seeking behaviour and low in self-control reported significantly more
property delinquency. Interpersonal delinquency was most influenced by
lack of self control. There was a negative correlation between substance
abuse and socialization. The reasons most often given for property and
substance delinquency were “fun/thrills” while those most often given for
interpersonal delinquency involved ”anger/revenge”. Risk raking and thrill
seeking may be related to substance abuse.

Vincent and Mc Cabe (2000) examined perceived family and peer
influences on body dissatisfaction, weight loss and binge eating
behaviours in adolescents. It was found that direct influences of family and
peers, rather than the quality of these relationships, predicted body
dissatisfaction and disordered eating in adolescent boys and girls,
differences were found between boys and girls in the nature of the
influences and in the way they were expressed. Parental and peer
discussion and encouragement of weight loss predicted disordered eating
behaviour in girls, while maternal and peer encouragement predicted binge eating and weight loss behaviour in boys. Fathers played a salient role in the expression of more severe forms of eating problems, while siblings played a small yet significant role in cognitive restraint among girls. The findings highlight gender differences in the importance of significant others in the expression of body dissatisfaction and disordered eating in adolescence.

Kaur (2002) surveyed the dietary habits of obese and non-obese adolescents by the diary methods for which the subjects maintained a 7-day food records which was designed to elicit type, frequency and temporal relationships of food consumption. A difference in male’s and female’s Eating Habits was also assessed. It was found that the total number of food items consumed per day showed gender dependent differences with males consuming significantly greater number of foods than females. Men were found to consume more calorically dense foods, a greater number of foods, and a greater number of calories per eating incident than women. Females also exhibited more of emotional eating.

Sehgal (2003) reported that significant gender differences emerged on dimensions of Health Habits viz. Exercise Habits, with boys group scoring higher than the girls and, Avoidance of use of Alcohol and Drugs with girls group scoring higher than the boys group.

Hovs et al. (2003) assessed the physical activity levels in children and adolescents. It was found that, there was no difference in physical activity level between boys and girls, but a significant difference in AEE (Activity Related Energy Expenditure was found between the two sexes.

Shourie (2003) hypothesized that Perceived Health status and Health Protective Behavior would play a significant role in discriminating between Good and Poor Control Diabetic male and female groups. It was found that significant difference emerged only on Health Protective
Behaviour, with Good Control Diabetic Females scoring higher than the good control diabetic males.

**BODY MASS INDEX AND GENDER DIFFERENCES**

In the present study it was found that male adolescents scored higher than female adolescents on Body Mass Index.

Some earlier studies also reported significant gender differences as found in the present study.

*Kaur (2002)* conducted a comparative study on obese and normal weight male and female adolescents and found that the male adolescents had significantly higher BMI than female adolescents.

*Sehgal (2003)* compared teenage boys and girls on Body Mass Index as one of the correlates of Teenage Health Status. It was found that significant gender difference emerged on BMI, with boys reporting as having higher BMI than the girls.

*Danielzik et al. (2004)* conducted a study on prepubertal children. It was reported that boys were heavier and taller than girls, but girls had a higher fat mass than boys.

The research finding of the present investigation have confirmed some of the hypothesized gender differences.