REVIEW OF LITERATURE

The new millennium has sharpened the focus of attention towards the beauty, balance, harmony and health. In a rare combination of factors, mind and body have been identified to play a duet of symphony. When media is highlighting the beauty it is also fixing concern on growing Obesity.

A. CONCEPTUAL FRAMEWORK

WEIGHT STATUS/OBESITY

Throughout the world, the prevalence of obesity is increasing, and at such a rate that this disorder has been called a modern epidemic. Overweight and obesity are no longer the sole province of the developed societies, nor of adults.

The prevalence of obesity is increasing in adults and children alike. Many developing countries throughout the world report a steep rise in incidence of obesity. An article in Times of India, 18th March, 2007 expressed concern at the rise of obesity and overweight in India, especially among the affluent children and youth. This article quoted Vishal Balf, CEO, Wockhardt group of hospitals as “Today’s generation of children may be the first in modern history to have a shorter life span than their parents”. This article further expressed that in this era of organic and vegan revolutions and diet charts, it comes as a shock when experts say that the 25-35 age group is far from being fit.

Generally, obese persons have a shorter life expectancy; they suffer earlier, more often and more severely from a large number of diseases than do their normal weight counterparts. They are also more likely to die prematurely of degenerative diseases of the heart, arteries and kidneys. Mental health is also affected and behavioural consequences of obesity
range from shyness and withdrawal to overly bold self-assertion, which may be rooted in neuroses and psychoses (Encyclopedia Britannica, 2002).

According to an article in Times of India, 6th November, 2006 fat people are a burden on the planet. It reported that today's fat America uses a billion gallons more of gas than the slightly chubby America of 10 years ago. Previous research has revealed that airlines use an extra 350 millions gallons of fuel and thus, produce and extra 3.8 million tones of carbon dioxide carrying around heavier people.

Obesity may be undesirable from an aesthetic sense, especially in parts of the world where slimness is the popular preference (Encyclopedia Britannica, 2002).

Obesity is also known as Corpulence or Fatness, excessive accumulation of body fat, usually caused by the consumption of more calories than the body can use. The excess calories are then stored as fat, or adipose tissue. In general, however, a body weight 20 percent or more over the optimum tends to be associated with obesity (Encyclopedia Britannica, 2002).

The body's ability to adjust food intake to body needs can be disturbed by numerous factors. Of these, hormone imbalances and glandular defects are believed to be of least importance, being demonstrable in only about 5 percent of all obese individuals. Although obesity maybe familial, suggestive of a genetic predisposition to fat accumulation, there is evidence that early feeding patterns imposed by the obese mother upon her offspring may play a major role in a cultural, rather than genetic, transmission of obesity from one generation to the next. More generally, the emotional reactions to it may contribute significantly to widespread obesity. Among the affluent populations, an abundant supply of readily available high calorie foods and beverages, coupled with
increasingly sedentary living habits that markedly reduce caloric needs, can easily lead to overeating. The stresses and tensions of modern living also cause some individuals to turn to foods and alcoholic drinks for ‘relief’ (Encyclopedia Britannica, 2002).

**Fishben (1959)** emphasized that obese individuals eat without regard to appetite, “to overcome fear or social maladjustments”.

Obese individuals were found to be more immature, and had more psychological problems and poor impulse control (Moore and Schultz 1983). The overeating of obese individuals is governed almost entirely by the enticing appearance of food (Schachter, 1968).


According to **Lindgren and Byrne (1971)**, eating tends to make fat people hungry. They eat because the food is there, ignoring signs of satiety or recent consumption.

An article in the Time of India, 4th September, 2006, quoted that obesity could make men infertile. A 20 pound increase in the weight of men can increase their chances of infertility.

**HEALTH HABITS**

While genetic and environmental factors play a definite role in causing obesity, it is largely accepted that one of the main causes for obesity is personal behaviour regarding their maintenance of health. Healthy habits among children lay the groundwork for positive youth development (Danner, 2000; Ge et al., 2001).

Healthy behaviour in adolescence is of greater relevance since this is the life stage when youth begin to exercise their independence from parental control and monitoring and when parents begin to grant children more autonomy to make their own decisions and judgments about what
they eat, how long they sleep, and in about what forms and level of intensity they engage in physical activity (Kathleen et al., 2003).

Adolescence is the life stage when individuals begin to formulate their healthy habits, setting patterns that continue into adulthood (Andrade et al., 1993).

Attention to healthy habits in adolescence has heightened as obesity has become a serious public health problem, and also due to its persistence into adulthood, and its associated health consequences, including morbidity and mortality (Must et al., 1992).

Generally health habits include eating and exercise pattern and avoidance of use of alcohol and drugs.

The Concept of Lifestyle

According to Bruhn (1988), lifestyle refers to an individual's philosophy of life and usually incorporate one's values, beliefs, attitude's and behaviours. One can acquire a lifestyle in all sorts of different ways: by watching and learning from others through information provided by different media and through life changes. For instance, parents who smoke cigarettes or drink alcohol or eat unhealthy food are likely to instill similar values or behaviours in their children who will come to view such behaviour as acceptable. Or it is possible that a glossy advertisement in which cigarette smoking is linked to a glamorous lifestyle might entice someone to begin smoking.

It is possible to list several illness lifestyles (Bruhn, 1988). To mention just a few these may include the following: minimal self care activities, risk seeking health behaviour, external locus of control, low self-esteem, as well as the perception that one's behaviour is difficult to change or that change itself is not worth it. It is possible that an individual who puts his or her health at risk may manifest one (but rarely all) of the lifestyles listed above.
Health, Leisure, Physical Activity and Happiness

Argyle (1997) argued that some kinds of leisure is good for health. Sport and exercise give the greatest benefits. Exercise has been found to have widespread benefits for health, including heightened immune function. It also reduces the effect of stress on health.

Turning to more permanent states of happiness, serious leisure, such as hobbies and leisure groups with a particular purpose is a major contributor. Argyle (1997) found that people who have committed forms of leisure feel more challenged and stressed, but have more leisure satisfaction and are happier than those who do not. Some other studies however have found that most people prefer to be challenged less in their leisure time.

Heaven (1996) listed some of the psychological benefits that flow from physical fitness. These include such features as feeling more positive about oneself, reducing depression, helping to reduce hostile behaviour in oneself and so forth. Thus, as Harris (1991) has argued, there are many benefits to being physically active. Indeed, she stresses that one cannot afford not to exercise. It is as though physical exercise remains the only constant factor in the teenager’s world, which is subject to biological, emotional and cognitive change. Regular exercise also has some discernible physical benefits.

Diet and Health Status

Heaven (1996) said that there is at least one compelling reason for adolescents to maintain a healthy and balanced diet and that is because of the growth spurt. There are gender differences, however, with boys tending to gain more muscle than girls who, in turn, gain more fat.

Heaven (1996) further stated that teenagers perceive certain barriers to improving their nutrient intake. These are lack of time, the view that eating properly is inconvenient, and the lack of a sense of urgency. As
regards attitude formation toward diet and nutritional issues, teenagers absorb parental values about a wide range of important health issues and so family experience is vital. Interestingly, some evidence suggests that this might be the case for male, but not for females.

More recently, strong arguments have been made about the important effects that television programs and advertisements have in shaping attitudes toward health issues as well as health behaviors. Wallack and Dorfman (1992) noted that those individuals who watched more television were more likely to believe in the healing powers of medication than adopting healthy behaviours.

**Health Protective Behaviour**

According to Kasl and Cobb (1996) health protective behaviour is any activity undertaken by a person believing himself to be healthy, for the purpose of preventing disease or detecting it at an asymptomatic stage.

Harris and Guten (1979) assumes that all individuals engage in some behaviours intended to protect their health, medically sanctioned or not or objectively effective or not. Harris and Guten identified these behaviours and their relation to actual health status. These activities were termed health protective behaviour (HPB) and defined as “any behavior performed by a person, regardless of his or her perceived or actual health status, in order to protect, promote or maintain his or her health, whether or not such behavior is objectively effective toward that end”.

Harris and Guten (1979) conducted an exploratory study using 1,250 randomly chosen residents in the greater Cleveland area. The three sets of variables assessed included health protective behavior, health condition and health belief models variables.

The cluster analysis indicated five clusters of health protective behavior named by these investigators as:
• **Health practices:** sleeping enough, relaxing, eating sensibly, exercising in moderation, avoiding overwork, avoiding chills, limiting certain food, and watching weight.

• **Safety practices:** repairing things, checking the condition of the things, having a first-aid kit, and posting emergency phone numbers.

• **Preventive health care:** physical and dental checkups.

• **Environmental hazard avoidance:** avoiding areas of crime and population and;

• **Harmful substance avoidance:** no smoking or drinking.

One acts to promote health by getting enough sleep, eating a balanced diet, and to avoid ill health by not smoking or practicing safe sex. One uses seat belts and crash helmets and teaches one's children to cross raids safely. People take up offers of cervical screening and have their babies immunized. People also practice health habits that they are scarcely aware of such as washing hands, or brushing teeth. People try to avoid exposure to pollutants such as cigarette smoke or addition in food. Adolescents may also be using similar health enhancing behaviours.

A typical person's lifestyle includes many behaviours that are risk factors for illness and injury like cigarette smoking, excessive drinking, drugs use, eat high-fat and cholesterol diets, overweight, too little exercise, too much stress not using seat belts in automobiles etc. Now, many people realize the danger these and other risk factors present and adjust their behaviour to protect their health (Sarafino, 1994).

Health behaviour has a preventive function – engaging in it helps to maintain or improve current good health and avoid illness. But when people are well they may not feel inclined to devote the effort and sacrifices that entail engaging in health behavior. Thus, engaging in health
behaviour may greatly depend on motivational factors, particularly with regards to the individual’s perception of a threat of disease.

In terms of good versus poor health, the results suggest that health protective behavior does not vary substantially by health condition. In general, those individuals classified as being in good, moderate or poor health did not display considerable differences in health protective behavior.

PERSONALITY

When psychologists define personality they tend to refer to qualities within in a person, a person, characteristics of a person's behaviour, or both. It is hard or even impossible to hide from other people our true self, our personality. If asked, people can usually describe the way they respond to the world. People have fairly realistic impressions of themselves and usually people use certain catchwords to describe their personalities like shy, sensitive, quiet concerned, outgoing all of which describe components of personality (Morgan et al., 2001).

Cattell (1950) stated that "Personality is that which permits prediction of what a person will do in a given situation. According to Freud, personality was “the integration of the Id, the Ego and the Super Ego”. Adler’s idea of personality was “the individual style of life or characteristic manner of responding of life’s problems, including life’s goals.

Eysenck (1968) proposed a definition of personality as “more or less stable and enduring organization of person’s character and temperament, intellect and physique which determines his unique adjustment to the environment. In their personality structure, some individuals possess “core” characteristics (either inherited or develop under influence of certain situations), which make them more vulnerable than others to certain kinds of human conflict, which threaten their emotional security. Costa and McCrae (1995) defined Personality as characteristics
that are pervasive and enduring and form a central part of the person's identity.

Once psychologists are able to characterize a person's personality, they can predict to some extent how that individual will behave in a wide variety of circumstances. An understanding of personality characteristics allows people to deal with others in realistic and accepting ways.

**Eysenck's Theory of Personality**

Eysenck (1970) on the basis of research and factor analysis put forth a dimensional system of personality which posits three major independent dimensions viz., Extraversion/Introversion (E/I), Neuroticism/Stability (N) and Psychoticism (P). He also proposed a psychobiological model to parallel these three dimensions (Eysenck, 1981 and Eysenck and Eysenck, 1985). The model is a hierarchical one which conceptualizes that each of the three broad dimensions are sub divided at a lower level into narrower and more specific traits.

Eysenck and Eysenck (1985) reported that each of these personality dimensions contains certain sub traits. The sub-traits of these dimensions are:

**Extraversion:** The subtraits of extraversion are – sociable, lively, active, assertive, sensation seeking, carefree, dominant, surgent and venturesome.

**Neuroticism:** The sub traits of Neuroticism are – anxious, depressed, guilty, low self-esteem, tense, irrational, shy, moody and emotional.

**Psychoticism:** The subtraits of psychoticism are – aggressive, cold, eccentric, impersonal, impulsive, antisocial, unempathic, creative and tough minded. It refers to a person who does not fit in anywhere.

It is argued that just as neuroses is pathological exaggeration of high degrees of some underlying trait of Neuroticism, Psychoticism is a
pathological exaggeration of high degrees of some underlying trait of psychosis.

In addition, the revised Eysenck Personality Questionnaire (EPQ-R) also contains a Lie Scale (Social Desirability), which was first incorporated in Eysenck Personality Inventory (EPI) to measure a tendency on the part of the subjects to fake ‘good’ responses. It is considered as a tendency to respond in to a socially desirable way; it is described as desire to conform to social norms (Edwards, 1954). Eysenck (1970) considered that a high lie or social desirability score shows a tendency to protect self esteem or as an ego defense mechanism.

Now it measures an independent stable factor which possibly denotes some degree of social naivette. Eysenck and Eysenck (1975) have shown that super traits of Extraversion, Neuroticism and Psychoticism are replicable across cultures (Eysenck and Eysenck 1983; Mohan, 2000; Mohan et al., 1995).

Health Locus of Control

Locus of control is considered to be an important aspect of personality and according to Smith et al., (1997), this construct has generated enormous interest over the past 30 years.

Locus of control as defined by Rotter (1966), refers to individual differences in the extent to which people perceive events as contingent upon their own behaviour or enduring characteristics (a belief in internal control) versus the extent to which they believe that reinforcement is contingent not upon the self, but upon external factors such as chance, fate or powerful others (a belief in external control).

In short, internal locus of control refers to the perception of positive and negative events as being a consequence of one’s own actions and thereby under one’s own personal control. In contrast, external locus of control refers to the perception of positive or negative events as being
unrelated to one’s own behaviour in certain situations and thereby beyond personal control.

Rotter (1966) postulated that an individual who perceives his or her illness as consequence of one’s own behaviour is said to have internal locus of control. Such a person is likely to recover soon but an external person tends to perceive his behaviour as determined by external events beyond his control; such as fate, powerful others etc. This is negative expectancy and he/she is unlikely to progress and recover from illness.

Health psychologist like Wallston et al. (1987) expanded the original scale beyond Rotter's so called simple internal – external dimension. Wallston et al. (1987) said that one’s health status may be determined by health locus of control dimensions. Wallston et al.’s (1987) Health Locus of Control Scale measures two dimensions of health locus of control viz., Health Locus of Control – Internal i.e. the extent to which individual believes that his/her locus of control for health is internal; and Health Locus of Control – External i.e. the extent to which individual believes that external factors like luck, chance, fate are affecting his or her health. There is a large body of research which has implicated locus of control in wide range of health behaviours and attitudes with internals engaging more in health promoting behaviours (Lau, 1982).

State –Trait Anxiety

Anxiety is the most central of human emotions. It describes the state of apprehension and dread cued by threat to essential personal values, the integrity of the personality, or to life itself (Korchin, 1986).

Anxiety is a state characterized by heightened autonomic system activity, specifically activation of the sympathetic nervous system, i.e., increased heart rate, blood pressure, respiration and muscle tone, subjective feelings of tensions and cognitions involve apprehensions and worrying (Kazdin, 2000).
Freud (1938) defined anxiety as "something felt", a specific unpleasant emotional state or condition that included feelings of apprehension, tension, worry and physiological arousal, and equated fear with objective anxiety (Freud, 1938), which he considered to be an emotional reaction that was proportional in its intensity to a real danger in the external world. Objective anxiety was generally beneficial because it served to warn the individual that some form of adjustment was necessary.

Consistent with Darwin’s Evolutionary perspective, Freud (1946) emphasized the adaptive utility of anxiety in motivating behavior that helped a person to cope more effectively with threatening and potentially harmful situations.

People differ markedly in their tendency to experience anxiety. Whereas, some people experience anxiety quite often, others feel anxious only rarely. Many of the early difficulties in defining anxiety stemmed from the failure to distinguish between state and trait anxiety (Spielberger, 1966).

Spielberger (1966) postulated two distinct anxiety constructs, namely State Anxiety and Trait Anxiety. An early attempt to elaborate a distinction between anxiety as a trait and as a state may be found in the factor analytic work of Cattell and his associates (Cattell and Scheier, 1961). Cattell and his associates stressed that there are dimensions of stable inter individual differences (traits) and dimensions of intra-individual changes (states).

Spielberger et al. (1970) defined State Anxiety as a transitory emotional condition characterized by subjective, consciously perceived feelings of tension, apprehension, nervousness and worry, and heightened activation (arousal) of the autonomic nervous system. In short, state anxiety refers to transient feelings of anxiety at a given moment in time (i.e., I feel anxious). Anxiety states may vary in intensity and fluctuate over time as a function of situational stress. Trait Anxiety on the other hand refers
to relatively stable differences in anxiety proneness, that is individual differences in the tendency to perceive or appraise stressful situations as personally dangerous or threatening, and to respond to such situations with elevations in S-Anxiety (i.e. I am an anxious person). Trait anxiety does not imply that a person is chronically anxious, but rather that he or she has a higher tendency than low trait anxious people to experience anxiety.

STRESS AND COPING

The modern world, which is said to be a world of achievements, is also a world of stress. One finds stress everywhere, whether it be within the family, business organization enterprise or any other economic or social activity.

A state of stress exists when unusual or excessive demands threatens a person's well being or integrity. Extraordinary efforts are needed to master the situation and there is the danger that coping capacities will be overwhelmed with the consequence of disturbed functioning, pain or anxiety, illness or even death (Korchin, 1986).

Stress is a general term to describe tense situations and reaction to stress usually has a strong emotional content. Seyle (1950) defined stress as the nonspecific (that is, common) result of any demand upon the body, be the effect mental or somatic.

Stress is defined neither by the conditions acting on the person (the stressor), nor by the state of the person (coping resources, ego strength etc), nor by his reactions (stress responses), but rather by the interplay of the three (Korchin, 1986).

Stress is perceived to be interaction between the person and environment. Lazarus (1966) defined stress as an organizing concept that includes a number or variables and processes – relationship between the
person and the environment that is appraised by the person as taxing or exceeding his-her resources and endangering his-her well-being.

Selye (1956) defined stress as the non-specific response of the body to any demand. Brooks - Gunn (1991) viewed stress as an individual response to events which is said to occur when an individual is confronted with an event that is perceived as threatening, requires a novel response, is seen as important (i.e. needs to be responded to), and for which an individual does not have an appropriate coping response available.

According to International Encyclopedia of Psychology (1996) stress is an adaptative reaction to circumstances that are perceived as threatening. It motivates people and can enhance performance. Learning to cope with adversity is an important aspect of normal psychological development, but exposure to chronic stress can have severe negative consequences if effective coping mechanism are not learned. The stress of contemporary life could impair immunologic functioning and increase susceptibility to disease.

Larsen (2000) opined that stress is the subjective feeling that is produced by events that are perceived as overwhelming and beyond one’s control. Events that typically elicit stress are called stressors. There are individual differences in response to stress. Stress really lies in the transaction between the person and the characteristics of the environment. Personality processes may moderate this transaction.

Type of Stressors

Stressors can be grouped into two categories: -

a) Life Event Stress

b) Chronic Stress or Daily Hassles
Stressful Life Events

Stress is the wear and tear of life caused by an excessive demand on the body system to cope. The stresses of daily life ranging from bodily adjustment to sudden temperature or humidity, an emotionally charged argument with one’s spouse or boss, all constitute stress.

In the recent years attention is being paid to the life events which may not be very detrimental for the growth of society but can play havoc in the life of person affected. For instance destruction of one’s house in fire, death of someone in the family, difficulties in job, marriage and various other threats or conflicts that many people face in their daily lives. Some of such events under certain conditions can act as powerful stressors that affect people’s lives directly or indirectly.

According to Encyclopedia of Stress (2000), a life event stress is a comprehensive list of external events and situations (stressors) that are hypothesized to place demands that tend to exceed the capacity of the average person to adapt. The difficulty in adaptation leads to physical and psychological changes or dysfunction, creating risk for psychological disorder or physical disease.

Solanki and Ganguli (1987) stated that life stress refers to a state of imbalance with an organism that (i) is elicited by an actual or perceived disparity between environmental demands and the organism’s capacity to cope with these demands, and (ii) is manifested through variety of psychological, emotional and behavioural response.

Daily Hassles or Chronic Stressors

These are persistent, repetitive, and almost routine stressors that are part of everyday life. Lazarus and Cohen (1977) have characterized daily hassles as stable, repetitive, low-intensity problems encountered daily as part of one’s routine. They are different from major life events and tend to have different negative behavioural outcomes (Kanner et al.,
These daily hassles are much less powerful than life events stressors and personal stressors i.e. individually the stressors do not generally pose severe threats, but cumulatively over time they may pose threats equally serious (Lazarus and Cohen, 1977). They are also chronic in nature i.e. their impacts persists over long period of time and the effects of the exposure are gradual (Cohen, 1980).

Hassles are irritants, things that annoy or bothers, which can make a person upset or angry, where as Uplifts are events that make one feel good, joyful, glad, or satisfied. Some hassles and uplifts occur on a regular basis and others are relatively rare. Hassles and Uplifts are related to health of an individual. The influence of stress may be more apparent if it is linked in time with the health outcome investigated, and therefore the best measure for illness research is likely to be minor events (Swartz, 1991).

COPING

Individuals cannot remain in a continuous state of tension. Even if a deliberate and conscious strategy is not adopted to deal with stress, some strategy is surely adopted. According to Lazarus (1981) coping refers to cognitive and behavioural efforts to manage disruptive events that tax the person’s ability to adjust. Coping responses are a dynamic series of transactions between the individual and the environment, the purpose of which is to regulate internal states and/or alter person-environment relations (Lazarus and Folkman, 1984).

Coping is a survival mechanism conceptualized as a transaction between an individual and the environment in which a response is directed at minimizing the psychological, emotional and physical burdens associated with a stressful situation (Folkman and Lazarus, 1988; Synder and Dinoff, 1999). It consists of constantly changing cognitive, behavioural and emotional efforts to manage particular external and/or
internal demands that are appraised as taxing or exceeding the resources of the person (Lazarus and Folkman, 1984).

According to Mohan (2003) coping is a continuous cognitive and behavioural process of overcoming stress and stressful consequences of external forces.

Coping Measurement

Although there are many ways to classify the coping responses, most approaches distinguish between strategies that are active in nature and oriented toward confronting the problem. Moos and Billings (1982) have organised the dimensions of appraisal and coping included in measurement procedures into three domains:

1. **Appraisal – Focused Coping**: It involves attempts to define the meaning of a situation and includes such strategies as logical analysis and cognitive redefinition.

2. **Problem – Focused Coping**: This seeks to modify or eliminate the source of stress.

3. **Emotion – Focused Coping**: This includes responses whose primary function is to manage the emotions aroused by stressors and thereby maintain effective equilibrium.

NEGATIVE AFFECT MEASURES

**Anger**

Anger (rage) was considered by Darwin (1965) to be a powerful emotion that motivated “animals of all kinds, and their progenitors before them, when attacked or threatened by an enemy”, to fight and defend themselves. Anger was implicitly defined as a psychobiological emotional state that varied in intensity, from mild irritation or annoyance to intense fury and rage (Spielberger, 1999).
Freud (1959) considered aggression to be a biologically determined instinctual drive that motivated hatred and aggressive behaviour. If aggression could not be expressed against external objects, it was turned back into the self, resulting in depression and other psychosomatic manifestations (Alexander and French, 1948).

According to Baron (1977) anger is a negatively toned emotion, subjectively experienced as an aroused state of antagonism towards someone or something perceived to be the source of an aversive event. It is triggered or provoked situationally by events that are perceived to constitute deliberate harm doing by an instigator toward oneself or towards those to whom is endeared. Provocation usually take the form of insults, unfair treatment, or intending thwarting. Anger is prototypically experienced as a justified response to some 'wrong' that has been done. Although anger is situationally triggered by acute, proximal occurrence, it is shaped and facilitated contextually by conditions affecting the cognitive arousal and behavioural system that comprise anger reactions. Anger expression is centrally linked to threat, perception and survival responding (Baron, 1977).

As a normal human emotion, anger has considerable adaptive value, although there are social cultural variations in the acceptability of its expressions and the form that such expression takes. In the face of adversity, it can mobilize psychological resources, energize behaviours for corrective action, and facilitate perseverance. Anger serves as a guardian to self esteem, operates as a means of communicating negative sentiment, patients the ability to redress grievances, and boosts determination to overcome obstacles to one happiness and aspirations. Akin to aggressive behaviour, anger has functional value for survival (Linder et al., 1997).

Despite having multiple adaptive functions, anger also has maladaptive effects on personal and social well being. Generally strong physiological arousal impairs the processing of information and lessens
cognitive control of behaviour. Because heightened physiological arousal is a core component of anger, people are not as cognitively proficient when they become angry. Also, because the activation of anger is accompanied by aggressive impulses, anger can motivate behaviour that does harm to others, which in turn can produce undesirable consequences for the angered person either from direct retaliation, loss of supportive relationships, or social censor. An angry person is not optimally alert, thoughtful, empathic, prudent, or physically healthy.

According to Spielberger (1988), "The concept of anger refers to emotional states that consists of feeling that varies in intensity, form mild irritation or annoyance to intense fury and rage.

Anger Experienced and Anger Expression Styles

Spielberger (1988) postulated two distinct Anger Experiencing styles viz., State Anger and Trait Anger. State Anger refers to an experience of anger in some specific situations for a short while. It is a psychobiological state or condition, consisting of subjective feelings that varied in intensity from mild irritation or annoyance to intense fury and rage, with associated activation of the autonomic nervous system. Trait Anger refers to the situation when it is a personality predisposition and also a preferred way of reacting to life’s situations. It is defined in terms of individual differences in the frequency that State-Anger was experienced over time.

In assessing anger it is important to distinguish between the experience and expression of angry feelings. Spielberger et al. (1983) constructed the State-Trait Anger Expression Inventory (STAXI) to assess the experience, expression and control of anger. The initial step in developing this inventory was the construction of the State-Trait Anger Scale (STAS; Spielberger, 1980), which was designed to assess the intensity of anger as an emotional state (S-Anger) and individual
differences in anger proneness as a personality trait (T-Anger).

Spielberger et al. (1983) gave three anger expression styles for assessing individual differences in the expression, suppression and control of anger viz. Anger Out, Anger In and Anger Control. Anger out expresses anger toward other people or objects in the environment. Anger out generally involves an increase in state anger and the manifestation of aggressive behaviour. Anger directed outward may be expressed in physical acts, such as assaulting other persons, destroying objects and slamming doors or expressed in criticism, insults, verbal threats and the extreme use of profanity (Speilberger et al., 1988). Anger in expresses anger inward, toward ego or self. It also means to experience anger but hold in (suppress) the angry feelings. Anger control refers to the control of experience and expression of anger i.e. how much an individual can control his angry feelings and maintain calm and composure.

Depression

Depression is one of the most common psychological maladies of modern humans, and it afflicts roughly twice as many women as men (Buss, 2000). The prevalence of depressive disorders with high economic and emotional cost and the possibility of its continuing as a major mental health problem for years to come, demand the attention of researchers as well as professionals particularly in the context psychiatrically normal adults, adolescents and children. It makes sense to consider depression as disrupting a person's thinking processes, emotional reactions and day to day behaviours.

Depression is projected to be the second leading cause of disability by the year 2020. According to Sharma et al. (2001) in India, clinically recognizable depressive disorders have been found to be as common as in the West.
Among the three approaches for depression, viz., psychoanalytic, interpersonal and cognitive one of the most influential of these theories was proposed by Beck in 1967 which studied the etiology of depression. Beck (1967) argued that all individuals possess cognitive structures called schemas that guide the ways information in the environment is attended to and interpreted. Such schemas are determined from childhood by our interactions with the external world. For example, a child who is constantly criticized may begin to believe she is worthless. She might then begin to interpret every failure experience as further evidence of her worthlessness. If this negative processing of information is not changed, it will become an enduring part of her cognitive organization, that is, a schema. When this schema is activated (e.g. by a poor grade on a test or any other failure experience), it will predispose her to depressive feelings (e.g. I am no good). Beck stated that as a result of this faulty information processing, depressed persons demonstrate a cognitive triad of negative thoughts about themselves, the world and the future (Friedman, 1998).

Adolescent Depression

Depression is common among adolescents also. Epidemiological studies have reported prevalence of depression in teenagers ranging 0.4 and 8.3%. Furthermore lifetime prevalence of depression in adolescents / teenagers varies between 15 and 20% which is comparable with the lifetime range in adults, suggesting that depression frequently has its onset in adolescence (Lewinsohn et al., 1986).

Depression has been found not only to influence the self esteem of adolescents, but also their suicidal thoughts and behaviour. It additionally increases adolescents’ chances of experiencing academic and interpersonal problems. These problems in turn increase depression, creating an on going cycle.
In contrast to early adulthood, teenage is a period during which levels of depression increase, especially for females. Although males exhibit higher levels of depression than females during childhood, females display higher levels of depression during adolescence. Peterson et al. (1993) suggested the following types of depressive disorders among adolescents:

- Depressed Mood
- Depression Syndrome
- Clinical Depression

In depressed mood teenagers report having the ‘blues’ or report feeling sad and down. Such feelings are usually triggered by an external source, for e.g. a bad grade at school or the break-up of a special relationship. Aspects of teenage depression can be viewed as part of a wide range of related problems that form part of a behavioural syndrome (Peterson et al., 1993). Studies have suggested that depression co-exist along with anxiety, feelings of loneliness, a fear of doing bad thing, fear of being unloved, nervousness, guilt etc.

Clinical depression coincides with major depression and dysthymia in adults. For a teenager to be diagnosed with a dysthymic disorder, evidence of a depressed or irritable mood needs to be present for nearly everyday for almost a year. In addition, at least two of the following also needs to be present (Peterson et al., 1993):

- Eating Problems
- Sleeping Problems
- Lack of Energy
- Low Self Esteem
- Reduced Concentration or Decision Making Ability
• Feeling of Hopelessness

Negative Affect

Negative Affect is a general dimension of subjective distress and unpleasant engagement that subsumes a variety of aversive mood states including anger, contempt, disgust, guilt, fear and nervousness with low Negative Affect being a state of calmness and serenity (Watson et al., 1988).

Hostility Symptoms

Hostility refers to the state of exhibition of aggression or violence. Movement against others is generally discouraged by members of social system, unless it is directed against sources of threat to the group itself, such behaviour is generally described as 'hostile or aggressive'.

The term ‘hostile is generally used to characterize the attitudinal background of the behaviour, whereas the term aggressive usually refers to the act or moving against another person or object.

Buss (1961) in his review of theory and research dealing with aggression, defined aggression as a response that delivers various noxious stimuli to another organism. Buss (1961) defined hostility as an implicit verbal response involving negative feelings (ill will) and negative evaluation of people and events.

Darwin (1965) defined hostility as a unitary drive or entity which could be directed inward towards the self or outward against other persons or objects.

Plutchick (1976) viewed hostility as a mixture of anger and distrust associated with indignation and resentment.

In numerous studies of depression, the classic syndrome includes despair and hostility (Reimanis, 1974). Schless et al. (1974) employed a large number of measures of hostility and depression and found...
consistently that the more severely depressed patients in their sample were also more inwardly hostile. Others have also reported similar findings (Gottschalk and Gleser, 1969). These results support the classic description by Freud (1917) in which depression is accompanied by hostility turned inwards.

Saul (1976) did a thorough examination of the concept and proposed that Hostility is a motivating force, a conscious or unconscious impulse or tendency aimed at injuring or destroying some object and is usually accompanied by the feeling of anger.

**POSITIVE MENTAL STATES**

**Optimism**

The Oxford Dictionary of Current English defines Optimism as "an inclination to hopefulness and confidence". Optimism and confidence are the bases for a state of what can be called serene confidence, a pleasant anticipatory emotion. When optimism is combined with a lack of confidence, there is still a positive affective tone to mitigate the unattractive prospect. It can be considered guarded 'optimism or hopefulness'.

According to Raikkonen et al., (1999) Optimists are people who expect positive outcomes. As a consequence, they expect to cope effectively with everyday stress and challenge, whereas pessimist are those who expect negative outcomes and do not expect to cope successfully (Scheier and Carver, 1992). Optimists are likely to persist in their goal-directed efforts, whereas pessimists are more likely to withdraw effort, become passive, and potentially give up on achieving their goals. As such pessimists are hypothesized to be more likely to experience the physical and emotional consequences of stressful situations than are optimists.

Optimism has been a widely studied predictor of individual differences in affect, (Scheier & Carver, 1993; Seligman, 1990).
According to Wikipedia, the free encyclopedia, Optimism, the opposite of pessimism, exemplifies a life view where one looks upon the world as a positive place. Optimists generally believe that people and events are inherently good. They have so-called "positive" outlook on life, believing that things will work out in the end.

Optimism has been shown to be correlated with better immune systems in healthy people who have been subjected to stress (Segerstrom et al., 2006).

According to Scheier and Carver (2000), optimists are people who expect good things to happen to them: Pessimists are people who expects bad things to come their way. Optimists and pessimists differ in several ways that have a big impact on their lives. They differ in how they approach problems and challenges in life, and they differ in the manner – and the success with which they cope with adversity (Scheier and Carver, 2000).

Satisfaction with Life

Satisfaction with life refers to an individual's personal judgments of well-being and quality of life based on his or her own chosen criteria (Diener, 1984).

Life satisfaction is one factor in the more general construct of subjective well being. Theory and research from fields outside of rehabilitation have suggested that subjective well being has at least three components, positive affective appraisal, negative affective appraisal and life satisfaction. Life satisfaction is distinguished from affective appraisal in that it is more cognitively than emotionally driven. It can be assessed specific to a particular domain of life (e.g. work, family) or globally (Corrigan, 2000).

According to Ryff and Keyes (1995) sociologists have started emphasizing life satisfaction as the key indicator of well being. Viewed as a
cognitive component, life satisfaction was seen to complement happiness, the more affective dimension of positive functioning. Still other studies parsed well being according to global questions about work, income, social relationships and neighborhood (Diener and Diener, 1995).

Perceived Happiness Status

Argyle et al. (1989) conducted a research on the area of subjective well being and reported that happiness is composed of three related components: positive affect, absence of negative affect and satisfaction with life as a whole. In addition to these, Ryff (1989) added a fourth component of happiness that concerns self-fulfillment and other “depth” elements such as purpose in life and personal growth. Happiness is not merely a transient emotional state, short lived and completely dictated by environmental events (Veenhoven, 1994); rather it is more often conceptualized as a personal trait (Costa and McCrae, 1984).

Myers and Diener (1995) described happiness as including of experience of joy, contentment or positive well being, combined with a sense that one’s life is good, meaningful and worthwhile. Happiness is a subjective phenomena for which the final judge should be ‘whoever lives inside a person’s skin’.

Lu and Shih (1997) opined that "the most general description of happiness would be an internal experience of a positive state of mind which can be induced through various means".

Seligman and Csikszentmihalyi (2000) opined that: “One’s enduring level of happiness results from three factors:

a) one’s set range – the basic biologically determined range within which one’s happiness normally will be;
b) The circumstances of one’s life: the conditions such as being married and living in a democratic country, somehow seem to contribute to happiness.

c) One’s voluntary control – the things you can do to get your happiness to the upper part of your set range.

Mental Health

Menninger (1945) defined mental health as the adjustment of human beings to the world and to each other with a maximum of effectiveness and happiness. It is the ability to maintain temper, an alert intelligence, socially considerate behaviour and a happy disposition.

The World Health Organization (1967) defined health as a state of complete physical, mental and social well being and not merely the absence of disease or infirmity.

According to Wig (1996), it is important to recognize that physical and mental health are really not separate. Health is indivisible. Body and mind together make one unit. The separation between body and mind is only a convenient way of thinking. Medical science has repeatedly demonstrated how powerfully the mind influences the body. It is not only that a healthy body keeps a healthy mind, but a healthy mind also greatly contributes towards a healthy body.

The world Federation of Mental Health (Wig, 1996) has recently come out with a three point definition of mental health based on the following three criteria:

• A person who is mentally healthy must be comfortable within himself or herself: if you are not comfortable within yourself, if you are tense, nervous, fearful, sad, aggressive or suspicious, you are not mentally healthy, at least not for the time you are having such negative emotions (Wig, 1996).
A person who is mentally healthy is not only comfortable within oneself but also makes others comfortable around him or her. It is a very important component of the definition. You may be very happy and comfortable within yourself but if you are making the life miserable for those around you, you are not a mentally healthy person. In fact the degree of your mental health can be judged from the faces of those who are in your company. Ultimately mental health is a kind of balance or harmony between our self interest and social responsibility (Wig, 1996).

A mentally healthy person is constantly striving to improve further. A mentally healthy person never feels that he/she has reached perfection because he/she is always making further efforts for self improvement (Wig, 1996).

Mental Health is aptly defined as the full and harmonious functioning of the total personality, realizing one’s full potential.

**Generalized Self Efficacy**

Human functioning is facilitated by a personal sense of control. If people believe that they can take action to solve problem instrumentally, they become more inclined to do so and feel more committed to this decision.

The construct of self-efficacy, which was introduced by Bandura, represents one core aspect of his social-cognitive theory (Bandura, 1997). Bandura (1977) has defined self-efficacy as "the expectation that one can successfully execute the behavior required to obtain desired outcomes in a specific situation". Feeling self-efficacious is related to successful adjustment to a host of negative life events. Feelings of efficacy have been shown to lead to greater effort, motivation and perseverance in the face of an impressive array of negative life events (Bandura, 1989).
In nutshell, according to Bandura (1994) self-efficacy means "people’s beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives". Self-efficacy beliefs determined how people feel, think, motivate themselves and behave. Such beliefs produce these diverse effects through four major processes. They include cognitive, motivational, affective, and selection processes.

According to Corsini's Encyclopedia of Psychology (2000) "Efficacy beliefs are the foundation of human agency. Unless people believe that they can produce desired results by their actions, they have little incentive to act or to persevere in the face of difficulties".

Flanner (2001) opined that self-efficacy refers to the individual's capacity to produce important effects. People, who are aware of being able to make a difference, feel good and therefore take initiative. People who perceive themselves as helpless are unhappy and not motivated for actions. It has been proved that the psychological effects of helplessness are different depending on whether the helpless persons believe themselves to be helpless forever, whether being helplessness is unique, and whether related to a specific domain or to most domains of life. In the worse case, helpless people are, deeply sad about not having control; are not motivated to take initiatives or to invest effort and perseverance; cognitively blind for any alternative or better view of the state of the world and, devaluate themselves.

Health Efficacy

Health efficacy refers to a person’s optimistic self – beliefs about being able to resist temptations and to adopt a healthy lifestyle (Schwarzer and Renner, 1995). As people proceed from considering precautions in general, to shaping a behavioral intention, contemplating
detailed action plans, and actually performing a health behavior on a regular basis, they believe in their capacity to initiate change.

According to Schwarzer and Fuchs (1995), perceived health efficacy represents the belief that one can change risky health behaviors by personal action. Adopting health promoting behaviors and refraining from health-impairing behaviors is difficult. The likelihood that people will adopt a valued health behavior (such as physical exercise) or change a detrimental habit (such as quitting smoking) may depend on three sets of cognitions: (a) the expectancy that one is at risk, (b) the expectancy that behavioral change would reduce the threat and (c) the expectancy that one is sufficiently capable of adopting a positive behavior or refraining from a risky habit (Bandura, 1992; Schwarzer, 1992; Maddux, 1993).

PARENTAL BONDING AND FAMILY–ADOLESCENT CONFLICT

Parental Bonding

The concept of a ‘bond’ between a parent and a child is generally accepted despite the lack of a satisfactory definition of the concept. Theoretically it might be proposed that parent-child bonds could be broadly influenced by characteristics of (e.g. individual differences in attachment behaviour), characteristics of the parent or care-taking system (e.g. psychological and cultural influences) and by characteristics of the reciprocal, dynamic and evolving relationship between the child and the parent (Parker et al., 1979).

According to Rutter (1972), the characteristics necessary for adequate mothering is a loving relationship, leading to an unbroken attachment to one specific person in the family who provides adequate stimulation.

Bowlby (1969), while discussing mother-child interaction, emphasized the retrieval behaviour of the mother which is concerned with
reducing the distance between infant and mother, so serving a protective function.

Ainsworth et al. (1975), drew attention to few dimensions of maternal behaviour which were reflected in the balance of attachment and exploratory behaviour in the children. The dimensions were labeled sensitivity-insensitivity, acceptance-rejection, cooperation-interference, and accessibility-ignoring.

Studies suggest that the parental contribution to bonding may be influenced by two principal source variables i.e. the first variable as “care” dimension and the second variable as “psychological control over the child” or “overprotection” dimension (Parker et al, 1979).

Care has been associated with affection, emotional warmth, empathy and closeness. Overprotection has been associated with control, intrusion, excessive contact, infantilization and prevention of independent behaviour (Levy, 1970, Parker et al, 1979.).

Parent-Adolescent Relationships

Although many people believe that adolescents lose respect for their parents and feel less close to them than they did as children, these beliefs simply do not hold up. The great majority of teenagers view their parents as key sources of affection and support.

It appears that parent adolescent relationships are very important and especially the parenting styles have a major impact on the personality, health and overall development of an adolescent (Gomez, 1984).

Studies have shown that parenting styles have been categorized as authoritarian or liberal attitudes toward child rearing, or communication behaviour, such as verbal support or destruction, interruptions or supplementary comments or integrative or distancing communications during discussions.
Baumrind (1991) found differences in adolescents development between authoritative and democratic styles on the one hand and authoritarian and disinterested styles on the other. Whereas adolescents from families with a democratic or authoritative style show more pro-social and socially competent behaviour, take fewer drugs, and have less internalization or externalization symptoms; adolescents who have experienced authoritarian or disinterested parenting styles show increased internalization, or externalization symptoms, take drugs display more antisocial behaviours and have low degree of individuation. Communication styles between parents and adolescents have been defined as being either enabling or constraining in light of different outcomes in adolescents development, such as identity formation, self esteem, perspective taking skills, or social competence (Williams, 2003). For example, an enabling style is characterized by supportive statements, or positive and warm atmosphere of exchange and a strong intention to find a common solution. In contrast, a constraining style is characterized by distortion, devaluation of the adolescent's statements, diffusion of meaning and the absence of a perspective about a common solution.

B. REVIEW OF RELATED STUDIES

PERSONALITY, BMI AND HEALTH HABITS

Nir and Neumann (1991) reported that (a) Subjects with low self-esteem scores lost significantly less weight than subjects with medium and high scores (4.3 kg vs. 8.7 and 6.4, respectively); (b) No significant differences were recorded between Internals and Externals with regard to weight reduction; and (c) Family-related variables, marriage and number of children, did not directly affect weight loss, but their effect was observed within the three self-esteem and the two Internal-External Locus of Control groups.
Mills (1991) administered Rotter’s (1996) Internal-External (I-E) Scale to 65 adult and adolescent females in two outpatient obesity treatment programs. It was found that the adults were higher in I-LOC and the adolescents higher in external LOC. These differences suggest that although the adults felt limited control over their weight and eating behaviour, this did not reflect a lack of perceived control over other factors in their lives. In contrast, the adolescent appeared to feel that they had limited control over an array of factors in their lives.

Mills (1992) hypothesized that obese adolescent girls would show greater externality than children of alcoholics. Rotter’s I-E Scale was administered to 19 moderately obese adolescent girls and 10 girls who were children of alcoholics in outpatient treatment. It was found that while both groups scored within the external range of control orientation, there was no statistically significant difference between the samples. Contrary to prediction, obese adolescent girls and adolescents from alcoholic environments have similar world views on control orientation.

Mills (1994) stated that the obese subjects were significantly more internally oriented than has been previously identified in obese populations. These findings challenge currently held assumptions about locus of control in obese groups. Although the obese and non-obese subjects maintained similar overall dependency scores, the obese subjects were more likely to show low levels of autonomy in comparison with the non-obese subjects. Interpersonal dependency and locus of control dimensions associated with obese conditions may serve as useful predictor variables influencing obesity treatment approaches and outcome.

Faith et al. (2001) reported that in men, increasing Body Mass Index was associated with increased Extraversion and Psychoticism, while among women, increasing Body Mass Index was significantly associated with increased Neuroticism and reduced Extraversion.
Kaur (2002) assessed the relationship between Body Mass Index and Personality. It was found that Body Mass Index was positively correlated with Health Locus of Control – Internal and significantly and negatively correlated with Psychoticism in males with Lie Scale (Social Desirability) for both male and females sample.

Sehgal (2003) examined an association between teenage health (Body Mass Index) and various personality dimensions. It was reported that Body Mass Index was positively related with Extraversion in case of girls and total sample; and negatively associated with Psychoticism in case of girls only.

Many earlier studies also report an association between Personality and Health Habits.

In Subjects attending a suburban self-help weight reduction program, successful weight reduction was associated with a relatively more “internal” score. Although it may be expecting too much of the locus of control construct to provide confirmation of an overall theoretical basis or understanding to obesity, it would appear to warrant further evaluation with specific groups of obese subjects, undergoing different weight reduction programs (Goldney and Cameron, 1981).

Schifter and Ajzen (1985) stated that intentions to lose weight among college were accurately predicted on the basis of attitudes, subjective norms, and perceived control; perceived control and intentions were together moderately successful in predicting the amount of weight that participants actually lost over the 6-week period. Actual weight loss was also found to increase with development of a plan and with ego strength factors that were assumed to increase control over goal attainment. Other factors, such as health locus of control perceived competence, and action control, were found to be unrelated to weight reduction.
Van Strien et al., (1985) reported an exploratory study in women. The relationships between scales of emotional eating, external eating, and restrained eating, and body mass index were studied, as well as the interrelationships between these three eating behavior components were also examined. In addition, the relationships between the three eating behavior scales and 19 personality scales were examined. Finally, differences between obese and latent obese women with respect to eating behavior and personality were investigated. Significant relationships were found between BMI and emotional eating, and between BMI and external eating/perceived hunger, but not between BMI and Restrained Eating. Also, restrained eating was found not to be related to the other two eating behavior components. Of the three eating behavior components, emotional eating was shown to have the clearest relationships with a number of personality traits. No difference was observed between the eating behavior of latent obese and obese women, but these groups differed as to a number of personality traits.

Davis and Fox (1993) in a study on excessive exercise and weight preoccupation in humans found that excessive exercises reported greater body dissatisfaction, were less neurotic and more extravert than non exercisers while excessive exercise was linked with decrease in body dissatisfaction and was decrease in body dissatisfaction and was negatively associated with Neuroticism, weight preoccupation with an increase in body dissatisfaction and positively related to Neuroticism.

Rosendahl and Kirschenbaum (1994) assessed the dieting behaviors in a sample of 183 overweight older adults were studied to assess how they were influenced by six 'cognitive, behavioral, emotional, and social variables. Responses indicated that reports of high quality dieting behaviors were associated with higher levels of depression and less effective coping skills. Dieting behaviors among subjects who were participants in weight loss programs were not as strongly associated with
less effective coping skills, but were associated with external health locus-of-control. The degree of social support had a limited impact on dieting behaviors, while measures of optimism and health status were unrelated to dieting behaviors.

The internal consistencies of three habit specific locus of control scales measuring drinking, smoking, and eating behavior were evaluated using coefficient alpha. The three scales along with Rotter’s Internal-External Scale were administered to 202 undergraduate students. Scores on the smoking and drinking scale had the lowest correlations with scores on Rotter’s generalized measure. Mean drinking scale scores were lower than those for smoking and eating, suggesting that people judge drinking to be under more personal control (Ludtke and Schneider, 1996).

Podar et al., (1999) assessed the relative contribution of personality and emotional experience to self-reported eating attitudes in a group of patients with clinically diagnosed eating disorders, weight reduction-training group (Weight Watchers) (r), and control group without body weight problems. It was observed that among the big five personality dimensions, Neuroticism made the largest contribution to eating disorder inventory-2 subscales. Two other dimensions, Openness to Experience and Conscientiousness, also predispose individuals to eating problems. Personality traits made a larger contribution to the self-reported eating pathology than the self-rated effects experienced during the last few weeks. It was argued that personality dispositions have a larger relevancy in the etiology of eating disorders than emotional state.

Wall et al. (2000) used the Achenbach Child Behavior Checklist (CBCL) to evaluate behavioral problems in 96 Mission Indian children and adolescents based on the presence or absence of parental alcohol dependence and sex of the offspring. Consistent with previous research, results indicated a high prevalence of a positive family history of alcoholism in these Native-American youths. Results indicated that sons of
alcoholics scored significantly higher on the Total Behavior Problem scale as well as the Internalizing and Externalizing scales, of the CBCL than sons of nonalcoholics, whereas there were no significant differences in CBCL scores between daughters of alcoholics and daughters of nonalcoholics. It is noteworthy that scores on the CBCL for Mission Indian children of alcoholics were comparable to scores in the published literature of children of alcoholics of other ethnicities. These findings suggest that sons of alcoholics of Mission Indian heritage experience more problems than sons of nonalcoholics, but also suggest that Mission Indian children of alcoholics are not more Vulnerable to behavioural problems than children of alcoholic parents of other ethnic backgrounds.

A 2000 study by University of Maryland, Medical Center (2000), reported that people with eating disorders tended to share similar personality traits, including low self-esteem, dependency, and problems with self-direction. Researchers have been attempting to determine specific personality disorders or behavioral characteristics that might put people at higher risk for one or both of the eating disorders. Some studies have reported the following personality disorders linked to particular eating disorders:

- **Avoidant personalities**, mostly in anorexia. Such people are generally high functioning, persistent, and perfectionists.

- **Dependent personalities**, mostly seen in anorexia. (This group is usually over controlled and withdrawn).

- **Borderline and histrionic personalities**, mostly seen in bulimia. (Such individuals are emotionally uncontrolled and impulsive).

- **Narcissism** in both anorexia and bulimia.

- It should be noted that any of these personality traits can appear in either patients with bulimia or anorexia; some experts believe that
the patient's specific personality disorders, rather than whether they are anorexic or bulimic, may be the more important factor in determining treatment choices. (University of Maryland, Medical Centre, 2000).

Holt et al., (2001) used the Weight Locus of Control Scale (WLOC) to predict weight-related attitudes and behaviors of overweight individuals, as well as their responses to health education materials (HEM) on weight loss. The WLOC scores predicted responses to baseline weight-related measures such as etiology of obesity, confidence in weight loss behaviors, and behavioral intention. In addition, WLOC scores predicted participants' reactions to the HEM, as well as the actual number of weight loss ideas from the HEM that the participants tried by the 1-month follow-up assessment.

Sharma (2005) assessed the relationship between Personality and Health Protective Behaviour. It was found that Health Protective Behaviour was positively correlated with psychoticism in case of total sample, Trait Anxiety and Lie Scale (Social Desirability) in case of girls. It was also found that Health Protective Behaviour in case of boys with Neuroticism in case of boys and case of girls it was negatively related with External Health Locus of Control, State Anxiety and Extraversion.

Izevbigie and Owie (2006) investigated the prevalence of eating disorders of female students and the consequences on their personality profile. The findings revealed that the students used unsafe weight losing methods to remain slim. The motivational factors were the electronic media and their friends. This led to the conclusion that the use of unsafe weight losing method would significantly result in change in personality profiles. The personality changes include feelings of inadequacy; lower self esteem, moodiness, fear and anxiety; and compensatory acts of obsessional responses.
STRESS, COPING, BMI AND HEALTH HABITS

An assessment of the levels of stressful life events among 88 morbidly obese patients and 276 comparison adults showed that the morbidly obese had undergone stressful events more frequently during the three years before surgery than the comparison adults over a similar time span. The rate of occurrence of such events in patients increased markedly in the year preceding surgery. Morbid obesity caused some life events, such as major medical problems, and made coping with other life events more difficult (Colleen et al., 1983).

Wolff et al. (2000) investigated the differences between binge eaters and controls on measures of daily stress, mood, coping, and eating behavior. The same measures were also used to compare binge days to non-binge days for the binge group. Results indicated that the binge group reported more stress and negative mood over the three weeks than the control group. The binge group reported experiencing a similar number of stressful events on binge days as compared to non-binge days however, the impact of those events was much greater on binge days. The binge eaters also reported less positive mood and more episodes of eating on binge days. The groups did not differ in the number of coping strategies used. Stress and negative mood appear to be common antecedents for binge eating. The role of coping responses and daily eating behavior (i.e., restraint) on binge eating was somewhat less clear.

Bjorntorp (2001) assessed the repeated activation of two stress centers viz. hypothalamic-pituitary (HPA) axis and the sympathetic nervous system and its involvement in the pathogenesis of abdominal obesity and its co-morbidities. It was reported that in population studies adrenal hormones show strong statistical associations to centralization of body fat as well as to obesity. There is considerable evidence from clinical to cellular and molecular studies that elevated cortisol, particularly when combined with secondary inhibition of sex steroids and growth hormone
secretions causes accumulation of fat in visceral adipose tissue as well as metabolic abnormalities (The Metabolic Syndrome).

Kaur (2002) assessed the relationship between Body Mass Index and Perception of Stress and Strain. It was found that Body Mass Index was significantly and negatively correlated with Presumptive Stressful Life Events and also with Daily Hassles.

Further in regression analysis with Body Mass Index as the criterion variable, it revealed that Stressful Life Events, Hassles and Stress Symptoms emerged as significant predictors.

Stauber et al. (2004) assessed the everyday coping styles in obese children in comparison to healthy controls independent of gender. No differences between coping styles of obese children and adolescents and healthy controls were found. In obese children and adolescents, emotional and external eating behavior were positively correlated with maladaptive coping strategies. In comparison to previous findings in chronically ill children, differences in obese children and adolescents and healthy controls on coping styles could not be confirmed in the present study. However, results support that the eating behavior of obese children and adolescents is influenced by coping styles.

Steptoe and Wardle (2005) expressed that disturbances of cardiovascular responsivity to psychological stress, which manifest through impaired post stress recovery, were associated cross-sectionally with BMI, and longitudinally, with central adiposity in men. Stress-related cardiovascular dysregulation may contribute to obesity risk.

According to Lee (2007), the main cause of obesity is overeating and the main cause of overeating is stress. Many, people today, especially young people, are now living a hectic and stressful lifestyle. Because they live this kind of life, they tend to eat comfort foods to get rid of stress.
Earlier researches also report an association between Stress, Coping and Health Habits.

Bohnen et al. (1990) examined whether salivary cortisol secretion as an index of stress reactivity to continuous mental task performance reflected individual differences in coping styles. Correlation data indicated a significant negative relationship between the coping style ‘comforting cognitions’ and the individual cortisol response during mental stress. During this particular type of cognitive stress, where the subject has no control over the experimental situation, comforting and emotion-focused coping may be effective because of the subjects’ efforts of trying to reframe the inevitable situation in a positive and self encouraging way. In contrast, there was no significant relationship between trait anxiety and individual glucocorticoid susceptibility to mental stress.

Watten (1996) investigated the Millon behavior Health Inventory basic coping styles, mental absorption (Tellegen Absorption Scale), Sensation Seeking (Arnett Inventory of Sensation Seeking, AISS) and Affect Inhibition (Marlowe-Crowne Social Desirability Scale, MC-SDS), in a group of abstainers from alcohol (n=55) compared to an age-equivalent group of moderate drinkers (n=176). It was found that the abstainers had significantly higher scores on sociability. There were no difference on the other basic coping styles. The abstainer group had lower AISS scores and higher MC-SDS scores. There were no significant differences between abstainers and drinkers in mental absorption. The results suggest that abstainers from alcohol may have adopted an affect-inhibiting, passive-ambivalent coping style associated with denial of hostility, rigid impulse control and social conformity.

Fryer et al. (1996) explored the relationship between stressors and disturbed eating attitudes among adolescent females, assessing the moderating role of coping and the mediating influence or poor self-esteem. Stressors and emotion-focused coping were found to be associated with
low self-esteem, which in turn was strongly associated with disturbed eating attitudes. Stressors were also directly related to disturbed eating attitudes.

Simantov et al. (2000) examined the motivation for adolescent smoking and drinking and also tried to identify the underlying risk and protective factors associated with these behaviours among adolescents. It was reported that, exposure to childhood abuse and stressful life events were strongly associated with increased risk for boys’ regular smoking and regular drinking. In case of girls, a history of abuse, violence within the family, depressive symptoms and stressful life events were significantly associated with increased risk for regular smoking and regular drinking.

Siqueira et al. (2000) examined the relationship of stress and coping methods to smoking status (never-smoker, experimenter, and current smoker) among an inner-city, clinic-based, adolescent population, as well as to examine the prevalence of smoking and related behaviors in this population using a cross-sectional survey. It resulted that overall prevalence of smoking in this population was 26%. The age of onset was 13.3 years for current smokers vs. 15.5 for experimenters (p<.01). Perceived stress and negative life events, adjusting for demographic variables, were highest among current smokers, less so in experimenters, and lowest in the never-smokers (p < .001). Stepwise logistic regression analysis showed that negative life events, perceived stress, greater use of the negative coping methods of anger and helplessness, and less use of the positive coping methods of parental support and cognitive coping were significantly and independently related to smoking status.

Crowther et al. (2001) reported that women who engage in binge eating rated daily hassles as significantly more stressful than women who did not binge. Also, women who engage in binge eating consumed significantly more calories on those days characterized by higher as opposed to lower levels of stress.
Shimai et al. (2002) studied the current problems of snacking behavior and their relationship to stress and coping among 1,486 fourth through ninth grade students from 10 elementary schools and six junior high schools. It was found that, 1) Students who frequently went without breakfast did not select healthy foods, i.e., fruits and dairy products, but popular snacks, i.e., potato chips, pop corn and sweet beverage. 2) Both external and emotional eating scores increased by age in girls but was not apparent in boys. 3) Students who preferred either western-style or popular snacks showed higher score of external and emotional eating. 4) The score of problem-focused coping was positively correlated with preference for health snacks, but emotion-focused coping was positively correlated with external and emotional eating scores. The close relationship between snack food selection and problematic aspects of eating behavior suggests that modification of eating behavior is necessary to develop healthy snack habits in early adolescents. Also, it was interesting that snacking behavior was closely related to stress and coping, which suggested the behavioral intervention for healthy eating habit should be included in development of stress-coping skills against various kinds of demands in life.

Park et al. (2004) tried to examine whether students drink more alcohol on higher-stress days than on lower-stress days; whether daily coping strategies and affective states mediate the within-person relationship between stress and drinking; and whether the daily stress-drinking process varies as a function of previously identified between-person risk factors (sex, family history, coping motives, sensation seeking, neuroticism. It was reported that with daily coping, affect and weekly trends in drinking controlled for, students consumed more alcohol on days that had events perceived as relatively more stressful. Students also drank more on days characterized by relatively lower problem-focused coping and relatively higher positive and negative affect. Contrary to predictions,
the effect of stress on drinking was not fully mediated by coping and affect. Findings also revealed individual differences in several links in the daily stress coping-drinking process.

**Naquin and Gilbert (2004)** examined college students' smoking behavior as well as their current smoking status and its effects on perceived levels of stress and coping styles. It was found that on the Perceived Stress Scale, current smokers' mean score was significantly higher than that of the students who had never smoked. In addition, the current smokers' mean score for Emotion-oriented Coping was significantly higher than that of the students who had never smoked or formerly smoked. The former smokers' (people who smoked earlier) mean score on Avoidance-oriented Coping was significantly lower than the never and the current smokers. Ten percent of the students smoked their first cigarette after high school, while 11 percent started to smoke on a daily basis after high school.

**Freeman and Gill (2004)** evaluated whether psychological stress, use of specific coping strategies, and trait dietary restraint would prospectively predict binge eating episodes. It was found that regardless of level of depressed mood, higher stress was associated with increased risk of same-day binge eating; distraction coping was associated with increased risk of future binge eating; social support was associated with decreased risk of same-day binge eating; and women with high versus low dietary restraint showed different patterns of relationship for stress, coping, and binge eating.

**Sharma (2005)** reported that Health Protective Behaviour was negatively related with Emotion Focused Coping in case of total sample. Among boys it was positively related with stress symptoms. Among girls, it was positively associated with Problems Focused Coping and General Health.
Hampel and Petermann (2006) investigated age and gender effects on perceived interpersonal stress, coping with interpersonal stressors, and psychological adjustment among early and middle adolescents. It was found that fifth graders scored lower on maladaptive coping strategies and externalizing problems and reported more adaptive coping strategies than sixth and seventh graders. Compared with boys, girls evaluated a higher amount of perceived interpersonal stress and used more social support. Additionally, girls scored higher on maladaptive coping strategies and emotional distress and scored lower on distraction than boys. Problem-focused and emotion-focused coping were negatively related to emotional and behavioral problems, whereas perceived stress and maladaptive coping was positively associated with adjustment problems. These relations were stronger in female than in male adolescents.

Tsatsoulis and Fountoulakis (2006) stated that in today’s environment, the stress response can be elicited by emotional stimuli or professional and social stress. Such psychological stress may be protracted and unrelated to an increased metabolic demand. Thus the energy mobilized is not used but is stored in visceral fat depots by the combined action of hyper-cortisolism and hyper-insulinemia. Moreover, chronic stress has deleterious effects on the brain and, in particular, affects hippocampal structure and function leading to cognitive and mood disturbances. This stress induced clinical phenotype is likely to be exaggerated in the presence of physical inactivity, resulting in a “stress-induced exercise deficient” phenotype. It is therefore concluded that chronic psychosocial stress, in the presence of physical inactivity, is likely to contribute to the epidemic of cardiometabolic and emotional disease of our current society.

Raikkonen et al. (2007) evaluated whether psychosocial factors that are related to cardiovascular disease and type 2 diabetes predict
prospectively the risk for the metabolic syndrome. It was reported that among women who did not have the metabolic syndrome at the baseline, the risk for the metabolic syndrome defined in multiple ways varied from 1.21 to 2.12 fold for more severe depressive symptoms or very stressful life events. Those who at the baseline reported feeling frequently and intensely angry, tense, or stressed also had an increased risk for developing the metabolic syndrome at least by one definition (relative risk 1.19-1.66).

**NEGATIVE MENTAL STATES, BMI AND HEALTH HABITS**

Plutchik (1976) constructed a questionnaire to examine the relationship between eating habits and emotional attitudes toward food. This was administered to 60 individuals who varied widely in body weight relative to the statistically determined optimum for their age and sex. It was revealed that the more the degree of overweight, the greater the tendency to have problems in three areas: depression, anxiety and impulsivity. In addition, the number of overweight relatives in one's immediate family also is related to an individual's degree of overweight.

According to Leon (1979) Psychological investigations have failed to reveal a distinct personality type or psychodynamic conflict pattern in moderately and massively obese persons. Many of the psychological problems noted in the obese such as anxiety, depression, and poor self-esteem seem to be the result of, rather than the cause of, the obese state. Morbidly obese persons share an addictive behavior pattern that is also seen in persons with other types of addictions. The extent of their obesity points to the strong substance abuse component of the eating disorder (Leon, 1979).

Isnard- Mugnier et al. (1993) stated that the obese adolescents had more depressive symptoms, more prevalent anxiety disorders, more frequent histories of parental depression, eating behaviors characterized
by over-eating and/or restricted intake, lower self-esteem and dissatisfaction with their body image, leading to avoidance behaviors in some of them. It clearly shows that Psychological manifestations, although they are still insufficiently documented, especially in adolescents, may aggravate obesity and interfere with treatment.

Overweight individuals report eating more when anxious, depressed, or alone. Normal weight individuals do not show these behaviours. Plasma serotonin levels have been shown to be lower in obese carbohydrate cravers than obese/lean non-carbohydrate cravers. Consumption of large carbohydrate meals in obese individuals is often associated with mood disturbances (Wurtman, 1993).

Villa et al. (1995) studied eating and emotional disorders in adolescent insulin-dependent diabetic (IDDM) girls. It was found that adolescent IDDM girls are at increased risk of eating and emotional disorders. Obesity appears to be an important factor for psychiatric complications; more obese IDDM girls suffered from eating disorders NOS (sub-clinical bulimia), dysthymia, anxiety disorders, depression and low self-esteem (Family Satisfaction SEI sub-score) than did non-obese IDDM girls.

Rasheed (1998) reported that the obese were significantly more likely to eat under emotional conditions of stress and anger, in secrecy, and indulge in binge eating (P < 0.05). Frequent snacking and drinking of regular soda drinks was also more common in this group compared to the controls (P<0.05). A weak association was observed for nibbling at food without being aware and preference of sweet foods compared to savoury ones by the obese (P<0.1).

Central obesity is an important risk factor for chronic disease. Raikkonen et al. (1999) examined whether anger and hostility, ie, psychological attributes that influence cardiovascular morbidity and
mortality, prospectively predict central visceral obesity across 13 years. It was found that the higher the Visceral Adipose Tissue (VAT) score, the higher the trait anger and anger-out scores measured 13 years earlier (Ps < .04) and the higher the concurrent hostile attitudes score (P < .02). Moreover, the higher the VAT score, the greater the increase in trait anger over the study period (P < .03). Trait anger and hostility predicted VAT independent of fasting insulin levels.

**Goodman et al. (2002)** stated that among the 9.7% who were obese at follow-up, 79.6% were obese at baseline, 18.6% were overweight, and 1.8% were normal weight at baseline. Having depressed mood at baseline independently predicted obesity at follow-up among those not obese at baseline.

Depression in children is often linked with obesity. But it seems to be a case of chicken and egg. The two conditions often occur together, but it is unclear exactly which is cause and which is effect. Obesity rates are soaring. One study, published in Pediatrics, found that the longer a child is overweight, the more he or she is at risk for depression and other mental health disorders. The study followed nearly 1,000 white children in North Carolina, ages 9 to 16, over eight years. Young boys, but not girls, proved especially prone to the dual problem of obesity with depression (**Lawson, 2003**).

**Kaur (2002)** assessed the relationship with Body Mass Index and indices of Negative Affect such as Depression and Irritability. It was found that Body Mass Index was positively correlated with Irritability in females and positively correlated with depression in case of males sample and total sample.

**Isnard et al. (2003)** stated that binge eating symptoms were frequent in severally obese adolescents who are seeking treatment for obesity. The binge eating dimension was related to high levels of anxiety.
and depression, as well as to low levels of self-esteem and body-esteem. The dimensions of anxiety and depression were associated specifically with binge eaters.

**Raikkonen et al. (2003)** tested in 134 African American and European American children whether hostility measured at study entry predicted the metabolic syndrome risk factors 3 years later. Hostility was measured with the Cook-Medley Hostility Scale (Cook and Medley, 1954) and with ratings of Potential for Hostility from interview responses. Metabolic syndrome was based on having at least 2 of the following risk factors above the 75th percentile of scores for their age, race, and gender group: body mass index, insulin resistance index, ratio of triglycerides to high-density lipoprotein cholesterol, and mean arterial blood pressure. Children who exhibited high hostility scores at baseline were likely to exhibit the metabolic syndrome at the follow-up.

**Jorm, et al. (2003)** investigated the association of obesity with anxiety, depression and emotional well-being (positive and negative affect) in three age groups. It was reported that obesity in women was associated with more anxiety and depression and less positive affect, but there were only weak and inconsistent associations in men. When factors that might mediate any association were controlled (physical ill health, lack of physical activity, poorer social support, less education and financial problems), a different picture emerged, with the underweight women having more depression and negative affect and the obese and overweight women tending to have better mental health than the acceptable weight group.

**Symister and Friend (2003)**, found that obese children rated their quality of life with scores as low as those of young cancer patients on chemotherapy. In this study, 106 children aged 5 to 18 filled out a questionnaire used by pediatricians to evaluate quality of life issues. The results indicated that, that teasing at school, difficulties playing sports,
fatigue, sleep apnea and other obesity linked problems severely affected obese children's well being. Interestingly, parents answered the some questionnaires, and their ratings of their children's well-being were even lower than the children's self ratings.

Mc Elroy et al. (2004) reviewed evidence regarding a possible relationship between mood disorders and obesity to better inform mental health professionals about their overlap. The most rigorous clinical studies suggested that (1) children and adolescents with major depressive disorders may be at increased risk for developing overweight; (2) patients with bipolar disorder may be at increased risk for developing overweight; (2) patients with bipolar disorder may have elevated rates of overweight, obesity, and abdominal obesity; and (3) obese persons seeking weight-loss treatment may have elevated rates of depressive and bipolar disorders. The most rigorous community studies suggested that (1) depression with atypical symptoms in females were significantly more likely to be associated with overweight than depression with typical symptoms; (2) obesity is associated with major depressive disorder in females; and (3) abdominal obesity may be associated with depressive symptoms in females and males; but (4) most overweight and obese persons in the community did not have mood disorders.

Although several studies have documented the existence of psychopathology in obese adolescents, disagreement remains regarding the extent and nature of this psychopathology. However, Erermis et al. (2004) reported that more than half of the clinical obese adolescents (16/30) had a DSM-IV diagnosis, often involving major depressive disorder (n = 10). The mean scores of anxiety-depression, social problems, social withdrawal and total problem in the CBCL (Child Behavior Checklist) scale of the clinical obese group were significantly higher than the non-clinical obese group and the normal weight control group. The mean total scores of the SES (Rosenberg Self Esteem Scale) and the CDI (Children
Depression Inventory) of the clinical obese group were higher than the normal weight control group. The mean total score of EAT (Eating Attitude Test) of the clinical obese group was significantly higher than the normal weight control group, and the mean score of EAT of the non-clinical obese group was significantly higher than the normal weight control group.

Earlier studies also report an association between Negative Mental States and Health Habits.

Labbe et al. (1988) investigated the effects of consistent aerobic exercise on depression, anxiety, and health locus of control for a group of nonclinical inactive women. 26 women were randomly assigned to either an exercise group (n = 10) or exercise with cognitive strategy instructions (n=16). All subjects increased distance run in 12-min. run test from pre- to post test. Women improved in depression and trait anxiety. Depression was significantly correlated with body mass index at the end of the program. Post test state-anxiety was significantly correlated with 6-wk. follow-up of exercise frequency. No significant difference in pre- and post test health locus of control was found. Type H scores were significantly correlated with number of exercise sessions attended. Consistent aerobic exercise had a positive effect on psychological functioning.

Smith et al. (1999) identified three groups of obese people entering weight loss treatment, and compared these groups on self-report inventories of eating patterns, dieting, and depression, as well as on treatment completion rates and weight loss. Using a measure which evaluates eating-related cognitive appraisals, participants were categorized into one of three cognitive groups (All-or-None, Rationalization, Matter-of-Degree). It was found that the cognitive group representing objective thinkers (Matter-of-Degree) reported significantly fewer problems with overeating and more personal control over eating than did the rigid, dichotomous thinkers (All-or-None). In addition, the Matter-of-Degree (MAT) group endorsed significantly less subjective hunger and
fewer depressive symptoms than the other two cognitive groups. The Rationalization group was more likely to complete a treatment program than was the All-or-None group, with the MAT group not differing from either. Despite these findings, there were no significant differences among cognitive groups on total weight loss.

Haukkala and Uutela (2000) examined how education and gender moderate the association of obesity with cynical hostility and depression. It was found that education moderates the positive association between cynical distrust and obesity among women in a such way that cynical distrust was not related to BMI or WHR among highly educated women. Depression had a positive association with WHR after age and education among both genders and among women. Depression had a positive association with WHR after age and education among both genders and among women with BMI. Bivariate associations between psychological factors and obesity measures were similar among men and women.

Teens who can't manage their anger often have weight problems, a new study shows, and their inability to handle anger might even bring on serious medical conditions.

"Problems expressing anger can translate into poor eating habits and increased weight, which may lead to a higher risk of cardiovascular disease at a young age," reported Mueller (2004), Professor of behavioral science at the University of Texas Health Science Center School of Public Health at Houston.

Parrott et al. (2004) examined the influence of anger control on alcohol related aggression. Analyses indicated that trait anger significantly predicted aggression, but only among men who were intoxicated and reported low levels of anger control. The findings suggest that anger control may be a crucial risk factor in determining whether one's anger proneness will lead to intoxicated aggression following provocation.
Anton and Miller (2005) examined anger, depression, and stress as related to alcohol consumption, saturated fat intake, and physical activity. Participants were 23 older adults enrolled in either an outpatient or in-residence executive health program. Participants completed (a) a health-risk appraisal assessing medical history and current health habits, (b) the State –Trait Anger Expression Inventory (STAXI), and (c) the Center for Epidemiological Studies-Depression Questionnaire. Bivariate correlations revealed that anxiety was negatively correlated with alcohol consumption. High levels of depression, trait anger, and outward anger expression style 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. Results suggest that anger, anger expression style, and depression interact with healthy and unhealthy behavior patterns and that these interactions may be complex.

Stella et al. (2005) examined the possibility of reducing depression inventory scores in female adolescents with third-degree obesity while testing the effectiveness of different exercise programs in reducing anxiety and depression scores. The sample consisted of 40 female subjects (mean age 16 +/- 1.56 years) divided into 4 groups (aerobic, training, anaerobic training, leisure activities, and control. The study showed that all three programs (aerobic exercise, anaerobic exercise and leisure activities) were effective in reducing body mass. However, a significant reduction was found when analyzing the depression scores only for aerobic exercise but no significant alternations for anaerobic exercise and leisure, thus indicating that in principle this type of activity could be included to improve emotional well-being of obese adolescent girls.

Connolly et al. (2006) investigated the influence of trait neuroticism on the relationship between binge eating and anger suppression. In addition, a broader measure of anger coping was utilized. It was reported
that anger suppression, rumination and a lack of assertion (i.e. anger inexpressiveness) were significantly correlated with binge eating tendencies. However, hierarchical regression analyses showed that the anger inexpressiveness measures were not predictive of binge eating tendencies over and above trait neuroticism. Furthermore, the association between anger, inexpressiveness and binge eating tendencies was differentially affected by the separate facets of neuroticism.

HEALTH PROTECTIVE BEHAVIOR, PERCEIVED HEALTH STATUS, BMI AND HEALTH HABITS

Fitzerald and Jarrett (1992) reported that in older men all causes mortality tended to be higher in those with a low BMI, but this was not so for CHD mortality. The latter was further studied after dividing the population into sub-groups according to age and cigarette smoking. With BMI distribution divided into fifths and five year age groups there were significant positive trends of CHD mortality across the BMI distribution in all age groups except the youngest (40-44 years) and oldest (60-64 years). For analysis by smoking category – never, ex- and current cigarette smoker – three age – specific groups were used: 40-49, 50-59 and 60-64 years. In men aged less than 60 years there was significant positive trends of CHD mortality and BMI in five of the six age and smoking categories, the exception being ex-smokers aged 40-49 years. Associations were strongest in the current smokers. By contrast, in men aged 60-64 years there was a significant association between BMI and CHD mortality only in ex-smokers and this was of low order (P=0.04). The data are compatible with some reports of a lesser association of obesity with mortality risk in older persons and in this data set the observation is not confounded by smoking habit.

Wei et al. (1999) reported that relative risks for all-cause mortality in obese men ranged from 2.3 for men with hypertension to 4.7 for those with CVD at baseline, Relative risk for all-cause mortality in obese men
with low fitness was 3.1 and in obese men with diabetes mellitus was 3.1 and as slightly higher than the Relative Risk for obese men who smoked or had high cholesterol levels. Low fitness was an independent predictor of mortality in all body mass index groups after adjustment for other mortality predictors.

**Al Riyami and Afifi (2001)** reported that in some studies smoking was associated with a lower body mass index (BMI) and increased waist hip ratio (WHR). The mean BMI was non significantly lower among smokers than never or former smokers. There was no significant difference regarding WHR. Adjusting BMI by 10 different multiple linear regression models for other covariates; age, educational level, marital status, having hypertension and total fasting glucose intolerance revealed significant association in 3 of them of BMI with smoking status. Non-significant association was revealed for WHR.

**Meyer et al. (2002)** studied the association between body mass index (BMI) and mortality, and evaluated the effect of physical activity during leisure time and smoking on this association in a general male population. A J-shaped association between BMI and total mortality was found and the form of association was similar for death from cardiovascular diseases. Although not statistically significant, a J-shaped association was also suggested in never-smokers. Irrespective of BMI level, ex-and never-smokers had lower mortality than current smokers. Obese smoking men had a relative risk of dying of 2.01 when compared with obese never-smokers, and a relative risk of 4.55 when compared with normal weight never-smokers. Within each category of physical activity during leisure time, obese men had a similar increased relative risk of death compared with normal-weight individuals. However, the U-to J-shaped association between BMI and mortality seemed to disappear by increasing level of physical activity, but this finding was not significant.
Kvaavik et al. (2003), reported the tracking of body mass index (BMI) from age 15 to 33 years, to examine the effect of adolescent and adult health-related behavior and parents’ BMI and education on adult BMI. They also examined changes in lifestyle factors as predictors of adult overweight and obesity. It was found that Adolescents' BMI, father's BMI, the subject's own Leisure Time Physical Activity, adult smoking, and sex explained 44.1% of the variation in adult BMI. The odds ratios of having a BMI of 25 or more as an adult was 0.07 for lowest vs highest quartile of adolescent BMI. The corresponding odds ratio of having BMI of 30 or more was 0.02. Those who increased their Leisure Time Physical Activity level between adolescence and adulthood had a lower risk of adult overweight than those with a stable low Leisure Time Physical Activity level.

Jeffreys et al. (2003) investigated the associations between body mass index (BMI) in early and mid-adulthood, and BMI change between these ages, and mortality. It was reported that mean BMI increased from 21.4 kg/m² in early adulthood. The all-cause mortality was associated with being overweight at age 22 but not at age 38. BMI at age 22 years was more strongly associated with CVD mortality than was BMI at age 38 years. There was no clear relationship between cancer mortality and BMI at either age, although relatively few men died of cancer in the follow-up period. Similar patterns were seen for obesity as for being overweight. Analyses of weight patterns indicated particularly detrimental effects of overweight persisting from early to mid-adulthood. Therefore it clearly shows that BMI in early adulthood is positively related to CVD mortality in later life in men. The risk associated with early adulthood adiposity appeared to be greater than that in mid-adulthood.

Furberg and Thune (2003) suggested that inactivity and high energy intake are major risk factors for endometrial cancer independent of
BMI, and that hypertension and relative hyperglycemia are significant markers of risk, especially among the heaviest women.

Bak et al. (2004) examined the long-term effects of leisure time physical activity (LTPA) and occupational physical activity (OPA) on later obesity. They also examined the effect of body weight on later physical inactivity in men, with and without juvenile onset of obesity. It was found that in the cross-sectional analyses, there were strong concurrent inverse associations between leisure time physical activity (LTPA) and prevalence of obesity in both the groups (obese & non obese group), whereas there was no relation to (OPA) Occupational Physical Activity. Further follow up of the subjects revealed that there was no long term influence of physical activity on development and maintenance of obesity in men, whereas greater body weight increases risk of later physical inactivity during leisure time.

Weinstein et al. (2004) reported that although BMI and physical inactivity are independent predictors of incident Type 2 diabetes, the magnitude of the association with BMI was greater than with physical activity in combined analyses. These findings underscore the critical importance of adiposity as a determinant of diabetes.

Yang et al. (2006) reported that maintaining a high level of physical activity from youth to adulthood was independently associated with lower risk of abdominal obesity in women, but not in men. These findings suggest that changes in physical activity patterns during the lifetime may help in reducing the abdominal obesity in women.

Earlier studies also report an association between Health Protective Behavior, Perceived Health Status and Health Habits.

Sandvik et al. (1995), studied the association between smoking habits and long term decline in physical fitness and lung function in middle aged men who remained healthy. It was found that initial fitness was
substantially lower among 347 persistent smokers than around 791 persistent non-smokers, as was initial forced expiratory volume. Mean decline in fitness over 7.2 years was 217 among smokers compared with 86 among non-smokers. Corresponding declines in forced expiratory volume were 271 ml in smokers and 116 ml in non-smokers. Differences between smokers and non-smokers remained practically unchanged after adjustment for age and level of physical activity. Changes in fitness and forced expiratory volume among 199 men who had stopped smoking mimicked the findings for persistent non-smokers, and 56 men who started smoking presented findings close to those of persistent smokers. It was concluded that decline in physical fitness and lung function among healthy middle aged men was considerably greater among smokers than among non-smokers and could not be explained by differences in age and physical activity.

**Straus and Mir (2001)** explored the relationship between smoking and dieting in a cross-sectional nationally representative sample of young adolescents. It was found that there was a two-fold increase in smoking among normal-weight adolescent girls who reported trying to lose weight. In contrast, prevalence of smoking was similar among overweight adolescent girls who tried to lose weight as compared to those who did not. Similar trends were observed in boys. However overweight boys who were trying to lose weight were less likely to smoke than overweight boys who were not trying to lose weight. There were no differences in body weight, BMI, caloric intake or fat intake among smokers and non-smokers. However, smokers reported eating less fruit and vegetables compared to non-smokers, and were over five times more likely to drink alcohol compared to non-smokers.

**Peterson et al. (2004)**, also examined the long term effect of leisure time physical activity (LTPA) on subsequent development of obesity and also the effect of body weight on later physical inactivity in a population –
based longitudinal setting, taking into account the effects of historical changes on future changes as well as pertinent confounders. For this, two surveys were conducted at five years apart, and assessed the (LTPA) leisure time physical activity, BMI (Body Mass Index) and several possible confounders. The results showed that, as compared to physical inactivity, the odds ratios of development of obesity among women with medium and high level of activity were 0.81 and 1.16, and among men, the odds ratios were 1.28 and 1.65 respectively. Compared to median BMI, the odds ratio of later physical inactivity among women with high BMI was 1.91 and among men the odds ratio was 1.50. The associations were not confounded or modified by age, pre-existing diseases, smoking, alcohol intake, educational level, occupational physical activity or by familial predisposition to obesity. This study did not support the assumption that physical inactivity as reported in the freely living adult population in the long term is associated with the development of obesity, but the study indicates that obesity may lead to physical inactivity.

Keski-Rahkonen et al. (2007) explored the association of eating styles with overweight and obesity in young adults, controlling for identical genetic background in monozygotic twins. It was found that the eating styles of obese young adults differ from their normal-weight counterparts: restrictive eating, overeating and fewer healthy food choices are associated with obesity. Different eating styles may partially explain weight differences in individuals with identical genetic background.

Howarth et al. (2007) compared relative associations of eating patterns and dietary composition with body mass index (BMI) in younger (aged 20-50 years, n=1792) and older (aged 60-90 years, n=893) participants in the Continuing Survey of Food Intakes by Individuals, collected from 1994-1996. It was reported that while no one eating occasion contributes more than any other to excess adiposity, eating more often than three times a day may play a role in overweight and obesity in
both younger and older persons. A reduced satiety response to dietary fiber in addition to lower energy expenditure may potentially further contribute to weight gain in older persons.

Haerens et al. (2007) stated that availability of (un)healthy food products, family food rules and TV viewing habits were related to one or more eating behaviours in boys or girls. Although home environmental factors can play an important role in influencing adolescents’ eating behaviours, these factors were generally less predictive of adolescents eating behavior than demographic and psychosocial variables.

POSITIVE MENTAL STATES, BMI AND HEALTH HABITS

Miller et al. (1999) evaluated the relationship between self efficacy judgements in obese individuals with binge eating disorder, “borderline” binge eating disorder, and no binge eating problems. The results revealed significant negative associations between binge eating and total Weight Efficacy Lifestyle Questionnaire scores as well as the subscales of Negative Emotions, Social Pressure, Physical Discomfort, and Positive Activities. Binge eating disorder diagnosis as well as severity of binge eating were strongly associated with low self-efficacy ratings.

Fontaine and cheskin (1999) examined the ability of the dispositional optimism to predict short-term obesity treatment outcomes (weeks of program attendance and weight loss), 177 consecutive persons seeking outpatient treatment completed the revised Life Orientation Test (LOT-R; Scheier, Carver, & Bridges, 1994) and underwent a comprehensive medically monitored weight loss program. The overall LOT-R and optimism subscales did not correlate with either attendance or weight loss. However, the pessimism subscale was positively associated with weeks of attendance.

Does obesity affect mental health? Two waves of data from a panel study of “community residents 50 years and older were used (Roberts et
al., 2002) to investigate the association between obesity and eight indicators of mental health: happiness, perceived mental health, life satisfaction, positive affect, negative affect, optimism, feeling loved and cared for, and depression. For none of the eight mental health outcomes examined did researchers observe a protective effect for obesity. Either no association was observed between obesity and psychological functioning, or the obese were worse off. Using 1994-1999 prospective data, the obese were at increased risk for poorer mental health on five of the outcomes examined using bivariate analyses. However, controlling for mental health problems at baseline and using statistical controls for covariates, the increased relative risk was limited to depression. There has been sufficient disparity of results thus far to justify further research on this question.

Fong et al. (2006) examined the relationship between BMI and patient satisfaction with health care providers using a nationally representative survey. It was found that obese patients reported significantly greater satisfaction with their health care providers than their normal-weight counterparts did (p<0.05). There were no significant differences in satisfaction between normal-weight and overweight patients or between overweight and obese patients. The health status domain produced the largest modification in the BMI-satisfaction relationship. Examination of interaction effects revealed that the association between BMI and satisfaction was confined to older persons.

Myint et al. (2006) investigated the association between two indices of obesity, BMI and waist-to-hip ratio (WHR), and self-reported physical and mental functional health. It was found that higher BMI and WHR were both independently associated with poorer self-reported physical functional health in men and women. The effect of BMI was greater in women compared with men, and the effect of WHR was greater in men compared with women, for poor physical functional health. Higher WHR
but not BMI was associated with lower mental functional health in men and women.

Research suggests that weight loss treatment generally benefits psychological well-being but these effects have never been quantitatively reviewed. A meta-analysis of 117 weight loss treatment tests showed that weight loss treatment was associated with lowered depression and increased self-esteem. Treatment type moderated treatment effects on depression and self-esteem. Actual weight loss moderated treatment effects on self-esteem but not depression; only treatments that produced actual weight loss predicted increased self-esteem whereas improvements in depression were independent of weight loss (Rodman and Newman, 2007).

Earlier studies also report an association between Positive Mental States and Health Habits.

Clark et al. (1991) developed and validated the weight efficacy Life-Style Questionnaire (WEL), improving on previous studies by the use of clinical populations, cross-validation of the initial factor analysis exploration of the best fitting theoretical model of self-efficacy, and examination of change in treatment. The resulting 20-item WEL consisted of five situational factors: negative emotions, availability, social pressure, physical discomfort, and positive activities. A hierarchical model was found to provide the best fit to the data. Results from two separate clinical treatment studies (total n=382) show that the WEL is sensitive to changes in global scores as well as to a subset of the five situational factor scores.

Clark et al. (1996) examined changes in self-efficacy following obesity treatment. In this quasi-experimental study, 26 obese subjects demonstrated significant improvement on the Weight Efficacy Life-Style Questionnaire (WEL) following participation in a 26 week multidisciplinary VLCD program. Subjects demonstrated significant improvement from pre
post-treatment on total WEL scores and on all five of the situational factors: Negative Emotions, Availability, Social Pressure, Physical Discomfort and Positive Activities.

Mulkana and Hailey (2001) examined the relationship between levels of optimism and participation in health-enhancing behaviors. Analyses revealed a positive association between scores on the measure of optimism and both of the health measures. This study extended earlier findings of a positive relationship between optimism and health-enhancing behaviors and demonstrated that this relationship can be observed for general health habits as well as in the context of a specific health threat.

Optimism is also related to well-being and health. Optimism has been found to be linked to optimum functioning and health both directly and indirectly by means of affectivity or self-esteem (Symister and Friend, 2003). Optimists seem to employ more problem-focused coping strategies and more effective ways of emotional regulation, both of which contribute to better functioning (Taylor and Armor, 1996).

Ylostalo et al. (2003) studied optimism and life satisfaction as determinants of general and dental health behavior and to evaluate whether these are connected with cardiovascular risk factors and dental diseases. It was found that health orientation increases with strengthening life satisfaction and optimism. Dental health behavior and general health behavior were associated with both cardiovascular risk factors and self-reported dental diseases, which support the assumption that they share a common behavioral background.

Taylor et al. (2004) reported that among 8 to 10 year old African-American girls, pessimism was related to increased sedentary behaviors and usual activity. Previous studies have reported relationships between optimism and health compromising behaviors. This study found that
pessimism may positively or negatively influence efforts to increase health promoting behaviors.

Both self-efficacy and optimism expectations are related to optimum functioning and health. High self-efficacy is related, for example, to the regulation of the stress process, to higher self-esteem, better well-being, better physical condition, better adaptation to and recovery from acute and chronic diseases (Bisschop, et al., 2004). Furthermore, low self-efficacy is related to more symptoms of anxiety and depression (Kashdan & Robers, 2004), as well as to lower levels of subjective well-being (Caprara, 2002).

Positive affect, an index of psychological well-being, is a known predictor of functionality and health in later life. Consedine et al. (2004) predicted, trait joy was associated with greater religious participation, while trait interest was associated with greater education. Joy was associated with lower morbidity and stress while interest was not. Interest was, in fact, associated with greater stress. Both emotions were positively associated with social support. They used the pattern of predictors to develop a functionalist conceptualization of these two emotions in later life, concluding that it was worthwhile to treat interest and joy as partially-independent positive affects contributing differentially to human emotionality and later life adaptation. One may infer from this that health benefits are associated with joy.

It has been suggested that positive affect states are protective, but the pathways through which such effects might be medicated are poorly understood. Steptoe et al. (2005) showed that positive affect in middle-aged men and women is associated with reduced neuroendocrine, inflammatory, and cardiovascular activity.

Sharma (2005) reported that Health Protective Behaviour was positively related with Perceived Happiness Status for the total sample. It
was also positively and significantly related with satisfaction with life in case of girls.

Sharma (2005) reported that Health Protective Behaviour was positively related with the dimensions of Mental Health viz. Being Comfortable with Self, Being Comfortable with Others and Perceived Ability to Meet Life Demands. It was also found to have positively related with Self Efficacy.

Karademas (2006) stated that optimism partially mediates the relation of self-efficacy and perceived social support to well-being. Optimism was predicted by daily emotional support and self-efficacy.

**FAMILY-ADOLESCENT CONFLICT, PERCEIVED PARENTAL BONDING, BMI AND HEALTH HABITS**

It is generally accepted that characteristic of family life are closely linked to the development and maintenance of obesity in children. The possible influence of family factors, has been debated for several decades. Bruch (1957), made interesting observations while treating obese children. She described a prototype of a mother of an obese child as ambivalent, exerting overprotection and rejection at the same time. Many obese children were unwanted, only children, or an afterthought. In a cross-sectional study of Copenhagen schoolchildren, Quaade (1955) could not replicate her findings.

Bruch (1957) suggested that a mother who does not like her child may react to this dislike by overprotecting and overfeeding the child, and thereby induce obesity. No information was there about whether overprotection and rejection were present at the same time. Children suffering from parental neglect seem to be at high risk of obesity in accordance with Bruch’s findings, but overprotective support, and particularly being well-groomed or being an only child, did not increase the risk significantly in the study. The association between parental neglect
and later obesity is far stronger than those for other psychosocial risk factors, such as parental education or occupation, (Lissau and Sorensen, 1992), quality of swelling of child’s school performance.

In a large representative community sample of more than 2,000 adolescents, Cubis et al. (1989) examined PBI (Parental Bonding Instrument) scores as predictors of psychosocial morbidity. In multivariate analyses, low paternal care was a significant predictor in few of the six analyses, predicting higher neuroticism, higher General Health Questionnaire scores, poorer body image, greater impulsivity and greater extraversion, but not the likelihood of professional consultation. A similar, but less distinct pattern of psychosocial morbidity, was associated with maternal protection.

Lissau et al., (1993) reported of a more than 7-fold risk of overweight in young adults whose mothers claimed not to know about the offsprings’ sweet-eating habits as a child.

Lissau et al. (1993) reported that genetic relationship can account for the familial resemblance in obesity in adulthood. This finding suggests that the rearing environment, as assessed by degree of obesity of the family members, has no sustained effect into adulthood.

Lissau and Asorensen (1994) examined the influence of parental care in childhood on the risk of obesity in the off spring in young adulthood.

It was found that family structure (biological or other parents and number of siblings) did not significantly affect the risk of adult obesity. Parental neglect greatly increased the risk in comparison with harmonious support. Dirty and neglected children had a much greater risk of adult obesity than averagely groomed children. However, being an only child, receiving overprotective parental support, or being well-groomed had no effect.
Parental neglect during childhood predicts a great risk of obesity in young adulthood, impendent of age body-mass index in childhood, sex, and social background (Lissau and Asorensen, 1994).

Okon et al., (2002) investigated if family interactions predict intraindividual symptom variation for adolescents with bulimia. It was found that potent family hassles were positive predictors of bulimic symptoms later that day for girls who perceived their family as having high levels of conflict or low levels of emotional expressiveness. This was not found when girls perceived their family environment as more normal.

May et al., (2006) described the developmental course of adolescent' weight concerns and examined links with changes in parent-adolescent relationship for girls and boys. It was found that girls' weight concerns increased from age 11 to 16 and then declined, whereas boys' concerns declined beginning at age 11. Increases in girls' weight concerns were linked to increases in conflict with mothers and fathers and decreases in maternal intimacy and knowledge. At a trend level, declines in boys' weight concerns were associated with declines in father conflict.

Earlier studies also report an association between Family-Adolescent Conflict, Perceived Parental Bonding and Health Habits.

Gomez (1984) compared PBI (Parental Bonding Instrument) scores on 10 anorexia nervosa patients along with healthy controls subjects which were selected from staff at a technical college. It was found that the anorexic patients rated their mothers as significantly less caring and significantly overprotective. In case of fathers, both anorexic patients and the healthy controls scored similarly.

Gomez (1984) compared PBI (Parental Bonding Instrument) scores for 20 bulimia nervosa patients with data from 20 technical college staff and their relatives. The only significant difference was that the bulimics scored their fathers as less caring. Palmer et al. (1988) contrasted PBI
scores for 37 bulimia patients with Australian general practice control group and reported significantly less maternal and paternal care in the bulimic patients, but no differences on the protection scale for either parent.

**Kashani et al. (1987)** assessed a representative sample of school attendees, being 150 adolescents aged 14-16 years. Nineteen percent were considered to have a psychiatric diagnosis, with that group scoring their parents as significantly less caring (correlation = -0.30) and non-significantly more protective (r = +0.60). Within the whole sample, adolescents who rated their parents as caring were characterized by a "sociable, confident, serious minded, rule conscious personality profile". Adolescents who rated their parents as overprotective "were more inhibited, more sensitive and less confident (and had) more concern with self-concept personal esteem, family rapport, and academic confidence".

**Palmer et al. (1988)** compared PBI (Parental Bonding Instrument) scores for 35 English anorexia nervosa patients with published Australian normative data, and suggested the anorexic patients reported significantly less maternal care. As differences were not distinctive and as the subjects and controls were not strictly matched, such a result should be treated with some caution.

**Calam et al. (1990)** compared the PBI (Parental Bonding Instrument) in 98 ‘eating disordered’ patients. These patients were subdivided into (31 with anorexia nervosa only, 33 with bulimia only and 34 with bulimia/anorexia both). It was found that the lowest score on maternal care were given by pure bulimics, lowest score on paternal care was given by Anorexia/Bulimia patients. The highest score for maternal overprotection was given by pure bulimics and the highest paternal overprotection was given by Anorexic patients.
Russell, et al. (1992) administered the PBI (Parental Bonding Instrument) to three groups of adolescents: (1) 54 anorexia nervosa patients (2) matched normals and (3) those referred for psychiatric assessment without anorectic symptoms. It was found that the anorexia patients rated their mother and father as more caring and less overprotective than the non anorectic referred group. Anorexia patients rated their mothers and fathers similarly to the non clinical control group (matched normals) on both the care and protection scales. Overall, this study found that anorexia patients were significantly more likely to describe their parents as 'optimal' than the other referred group, and interestingly this group of anorexia patients did not differ significantly from the non clinical subject group.

Haudek et al. (1999) explored the association among ethnicity, parental bonding, acculturation, and eating disturbances in Asian-American and Caucasian weight-concerned college women. It was found that contrary to hypotheses, weight concerned Asian-American women reported more dissatisfaction with body shape than did Caucasian women. Moreover, in the Asian-American group, acculturation was not associated with level of eating disturbance. In both groups, perceptions of low maternal caring were associated with higher levels of eating problems. In regression analyses, maternal care emerged as a better predictor of eating disturbance than did ethnicity.

Furnham and Husain (1999) aimed to determine whether conflict with parents is associated with Eating Attitudes test (EAT) scores in young British Asian student females. It was reported that eating attitudes test scores and conflict with parents over going out and choice of friends were correlated in the Asian group.

Panfilis et al. (2003) stated that weight phobia, body image concerns, avoidance, depersonalization, Global Severity index and positive
symptom total were predicted by low parental care, while compulsive self-monitoring was predicted by parental overprotection.

SIBLINGS’ AND PARENTAL BMI AND ADOLESCENTS’ BMI AND HEALTH HABITS

According to Bouchard (1985), obese parents are more likely to have obese children. Parents provide both the genes and eating environment for their children and familial patterns of adiposity are the result of gene-environment interactions. Environmental factors are implicated in the rapid increases in prevalence of childhood overweight that have occurred in the past 2 decades. Examination of aspects of the family environment may provide insight into increases in childhood overweight over time. For this purpose, Cutting et al. (1999) examined parental characteristics associated with overweight and eating behaviors in preschool children. Seventy-five preschool children and their parents were recruited from local daycare centers. Information was obtained on parents’ body mass indexes (BMIs), dietary restraint, and dietary disinhibition. A behavioral index of disinhibited eating in children was used to measure children’s eating when given free access to palatable snack foods in the absence of hunger. Children's weight-for-height values were also calculated. It was found that maternal dietary disinhibition ($R^2 = 0.35, P < 0.01$) and maternal BMI ($R^2 = 0.19, P < 0.05$) positively predicted daughters’ overweight. Maternal disinhibition ($R^2 = 0.35, P < 0.05$) mediated the relation between mothers’ BMI and daughters' overweight when both maternal disinhibition and maternal BMI were used to predict daughters’ overweight. Furthermore, when both mothers’ disinhibition and daughters’ free access intakes were used to predict daughters' overweight, mothers’ disinhibition ($P < 0.05$) showed independent prediction. These findings suggest that familial influences on child overweight differ according to parent and child sex. Also, these results suggest that mothers’ dietary
disinhibition mediates familial similarities in degree of overweight for mothers and daughters.

Obesity results from a net imbalance between caloric intake and energy expenditure. In humans, obesity is determined by an interplay of both environmental factors and genes (Bouchard and Perusse, 1993). The identities of the major genes involved are largely unknown, although the distribution of obesity in some populations suggests that there may be single loci segregating within families that have relatively large effects on body size or fat mass (Price et al., 1990).

Increased adiposity has repeatedly been identified as a major risk factor for a variety of chronic diseases. However, the question still remains whether the amount of adipose tissue itself is genetically mediated. To address this question, Comuzzie et al. (1994) conducted a segregation analysis, using maximum likelihood techniques as implemented in the computer program Pedigree Analysis Package (PAP), was performed on fat mass (kilograms of body fat) in a large sample of extended Mexican American families residing in San Antonio, Texas. The only model not rejected was a Mendelian mixed model for fat mass, incorporating genotype X sex interaction. In males the major gene accounted for 37% of the total variance compared with 43% in females. In both sexes homozygous recessive individuals have a fat mass more than double that of individuals of the other two genotypes. It was possible to reject linkage of the anonymous major gene for fat mass with several candidate loci for obesity. However, tentative evidence of linkage was detected with markers on both chromosomes 2 and 11, thereby providing hypotheses for future testing.

Fisher and Birch (1995) examined differences in preferences for high-fat foods, dietary fat intake, anthropometric measurements, and parental body mass index (BMI) among 3- to 5-year-old children. It was found that although all children were offered the same daily menu,
children's dietary fat intakes ranged from 25% to 42%. Children indicating strong preferences for high-fat foods had high total fat intakes. Children's fat preferences were also related to their triceps skinfold measurements. Finally, those children with the strongest preferences for high-fat foods and the highest total fat intakes had heavier parents than did children with low scores.

Fonseca Vde et al. (1998) assessed the overweight/obesity prevalence and associated factors in middle class adolescents of a school in the city of Niteroi, Rio de Janeiro, Brazil, and evaluated the correlation between body mass index with anthropometric measures of fatness. It was found that the proportion of overweight individuals among boys (Body Mass Index (BMI) greater than the 90th percentile of the Brazilian population) was 23.9%, whereas the prevalence among girls was 7.2%. The fact of being on a slimming diet was a relevant factor for the prediction of BMI and was 7 times more frequent among girls than among boys. Among boys, being on a diet, absence of breakfast, and family body appearance were positively associated with BMI. Among girls these variables were also significantly associated, whereas age at menarche was negatively associated with BMI. Hours of watching TV/video/video-game was associated with BMI only among boys. The correlation coefficient between BMI and measures of fatness varied from 0.7 to 0.9 for boys, and from 0.8 to 0.90 for girls.

According to Bray et al. (1999), recent advances in the molecular basis of body fat regulation have identified several genes in which genetic variation may influence obesity and related measures in human populations. Genes that have been shown to have a regulatory function in the control of body fat utilization, eating behavior, and/or metabolic rate in rodent models of obesity include leptin (LEP), leptin receptor (LEPR), neuropeptide Y (NPY), NPY Y1 receptor (NPYY1), glucagon-like peptide-1 (GLP-1), GLP-1 receptor (GLP1R), and uncoupling protein 1 (UCP1). Bray
et al. (1999) typed microsatellite markers located within or near the seven candidate obesity genes in 302 non-diabetic individuals from 59 Mexican-American families from Starr County, Texas. Sib pair linkage analysis was used to examine linkage between these genes and obesity status (obese siblings only; n = 170 pairs) and several obesity-related quantitative variables (all siblings; n = 545 total sibling pairs). Significant linkage (P = 0.042) was found between obesity and NPY (neuropeptide Y) within the obese sibling pairs. No other candidate gene was linked to obesity status in this subsample. Consistent with the obese sib pair linkage results, NPY showed evidence of linkage to body weight (P = 0.020), abdominal circumference (P = 0.031), hip circumference (P = 0.012), diastolic blood pressure (P = 0.005), and a composite measure of body mass and size (P = 0.048) in the entire sibling sample. Other significant linkages observed were between LEP (leptin) and waist/hip ratio (p= 0.010), total cholesterol (P = 0.030), and HDL cholesterol (p= 0.026) and between LEPR(leptin receptors) and fasting blood glucose (p= 0.018) and diastolic blood pressure (p= 0.003). These results support further investigation of NPY, LEP, and LEPR to identify genetic variation that may influence obesity status, glucose and lipid metabolism, and blood pressure in Mexican Americans.

Katzmarzyk et al. (1999) explored the evidence accumulated thus far that suggests a genetic component to the observed variation in abdominal visceral fat (AVF) levels. Evidence from the Québec Family Study (QFS) and the HERITAGE Family Study indicated that between 50-55% of the variance in AVF levels, adjusted for total fatness, is attributable to genetic factors. Additionally, a major gene hypothesis for AVF was supported in the both the QFS and HERITAGE Family Study. However, after adjustment for total fat mass the support for a major gene was reduced, suggesting that a major gene which affects fat mass may also affect AVF either directly (pleiotropy), or indirectly. The search for
candidate genes that may impact AVF levels is in its infancy, and few candidate genes have been identified. However, the glucocorticoid receptor (GRL), β3 adrenergic receptor (ADRB3), and fatty acid binding protein 2 (FABP2) genes have been significantly associated with AVF or intra-abdominal fat levels in humans.

Al-Isa (1999) conducted an explorative study to find out the factors that were associated with obesity among Kuwait University students. Factors that were found to be significantly associated with obesity included gender, age, marital status, obesity among parents, dieting, last physical check-up, year of study, number of brothers, sisters and regular meals eaten and high school GPA. Logistic regression analysis revealed that the same factors significantly contributed to the development of obesity except the last four.

Colilla et al. (2000) evaluated the inheritance of obesity in two different populations of African origin, i.e. 95 African-American families and 400 Nigerian families. Probands were selected from participants in the population-based International Collaborative Study on Hypertension in Blacks. Using class D regressive models, results from the segregation analysis of the African-American data showed evidence of a major gene effect on BMI. The Nigerian results were strikingly similar, with comparable estimates for the genotype frequencies and means and strong evidence for a major effect in the transmission of BMI. The high BMI allele frequency estimate of 24% is consistent with estimates in other studies, but the mode of transmission appeared co-dominant, which differs from studies involving predominantly white populations. In the Nigerian analysis, however, the probability of a high BMI homozygote parent transmitting a low BMI allele to his/her offspring was significantly different from the Mendelian expectation of zero, suggesting that additional complexities exist in the major gene inheritance of BMI in this population. The strong similarity of the genotype frequencies and means obtained from the African-American
and Nigerian samples suggests that a common co-dominant major gene effect may contribute to the variation in BMI in both populations.

Earlier studies also report an association between Siblings’ and Parental Health Habits and Adolescents’ Health Habits.

It is widely accepted that parental behaviors and practices shape many aspects of children’s development. With respect to children’s eating and energy balance, a few studies have shown that parents’ diet history and eating concerns and child-feeding practices influence the development of children’s eating behaviors and weight outcomes (Fisher and Birch, 1995). For example, adolescent girls who diet often learn to do so from their mothers, who may provide explicit advice on dieting. For much younger girls, mothers’ attempts to control their daughters’ eating are linked to daughters’ overweight, with mothers of heavier daughters reporting greater use of external control to regulate how much and what their daughters eat. One focus of these maternal control attempts is restricting intake, and mothers’ reports of restricting their daughters’ intake are related to the mothers’ own dietary restraint. Perhaps because dieting and weight concerns are less pervasive among men and boys, no such relations have been reported for males.

Klesges et al. (1983) investigated the relationship between selected parent behaviors, child mealtime behavior, and infant relative weight. It was found that significant correlations emerged between child relative weight and (a) parental prompts to eat \( r = .81, p < .001 \), (b) parental food offers \( r = .51, p < .05 \), and (c) parental encouragement to eat \( r = .82, p < .001 \). Thus, the present study suggests a relationship between certain parental variables and the relative weight of their children.

Dietary restraint and dietary disinhibition are psychometric constructs designed to capture individual differences related to eating and
weight control. Dietary restraint reflects the extent to which individuals attempt to cognitively control their food intake and dietary disinhibition reflects individual differences in the extent to which release from the cognitive suppression of eating occurs in response to the presence of palatable food or other disinhibiting stimuli, such as emotional distress (Stunkard and Messick, 1985). Dietary disinhibition has been described as overeating that occurs in the absence of hunger and has been linked to binge eating, bulimic episodes, and higher weight outcomes in adults. There are sex differences in restraint and disinhibition, with women tending to score higher on measures of dietary restraint and disinhibition than men.

Godin et al. (1986) studied the children’s perception of parental exercise and related these perceptions to (1) the self-reported parents’ habits of exercise, and (2) the children’s own activity patterns. Congruence between the children’s perceptions and the self-reported exercise habits of the opposite-sex parent 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 implies that during adolescence parental influences are minimized by other factors, personal or environmental.

Mc Muray et al. (1993) assessed the effect of parental attitudes and self-reported exercise habits on the fitness and activity levels of their children. One parent from each of 1,253 families was asked about exercise habits and completed the Exercise Benefits and Barriers Scale (EBBS) to determine their personal attitudes towards exercise. The children completed a self-reported activity questionnaire (SRA) and had their aerobic power predicted using a cycle ergometer test. Multiple regression indicated that the parents’ EBBS scores were weakly associated with the child’s maximal oxygen uptake VO2max); the mother’s
association was significant, but the fathers was not. The children’s SRA scores were not correlated with parents’ attitudes or exercise habits.

**Favaro and Santonastaso (1995)** evaluated the relationship between parents' psychological characteristics, their eating behaviour and the degree of obesity among their children, before and after 1 yr of treatment. Forty-nine couples with children suffering from obesity were studied. It was suggested that the mothers’ characteristics are more important than those of the fathers' in cases of both children's obesity and weight-loss. It was found that mothers with a more serious psychiatric symptomatology and a more disturbed personality were associated with more severe obesity in children. Children who lost less weight were younger and had an obese mother with a neurotic tendency.

**Dilorenzo et al. (1998)** tried to identify social learning variables relevant to children’s exercise habits and to explore the longitudinal predictive value of the determinants. The results of simultaneous stepwise regression analyses indicated that child’s enjoyment of physical activity was the only consistent predictor of physical activity during phase 1 (fifth and sixth grades). At phase 2 (eight and ninth grades), child’s exercise knowledge, mother’s physical activity, and child’s and mother’s friend modeling/support emerged as predictors for girls. For boys, child’s self-efficacy for physical activity, exercise knowledge, parental modeling, and interest in sports media were important. Longitudinally, mother’s self-efficacy, barriers to exercise, enjoyment of physical activity, and child’s self-efficacy for physical activity were important for girls. Only child’s exercise knowledge predicted boys' physical activity. The addition of information from fathers nearly doubled the explanatory power of the predictors for both genders.

**Carper et al.( 2000)** investigated the origins of dietary restraint and disinhibition in young girls by considering how parents’ control in child feeding and their daughters' perceptions of these practices relate to girls’
dietary restraint and disinhibition. Participants were 197 5-year-old girls (4.6–6.4 years) and their parents. Parental pressure and restriction were measured using the Child Feeding Questionnaire. Girls' perceptions of parental pressure and restriction were measured using the Kid's Child Feeding Questionnaire, and their restraint and emotional and external disinhibition were measured using an age-appropriate version of the Dutch Eating Behavior Questionnaire. Logistic regression was used to determine associations among parental control in feeding, daughters' perceptions of control, and daughters' dietary restraint and disinhibition. The results indicated that one-third of 5-year-olds reported moderate levels of dietary restraint, about 25% of the sample showed evidence of emotional disinhibition, and nearly 75% reported externally disinhibited eating in the presence of palatable foods. Daughters' dietary restraint and emotional disinhibition were related to their perceptions of parental pressure to eat more, while their external disinhibition was related to their perceptions of having restrictions placed on their eating. This research reveals that pressure in child feeding is associated with the emergence of dietary restraint and disinhibition among young girls, eating styles characterized by a lack of responsiveness to internal hunger and satiety cues.