

AN EXPLORATORY STUDY OF PREDISPOSING FACTORS
FOR EATING DISORDERS IN ADOLESCENT GIRLS

by

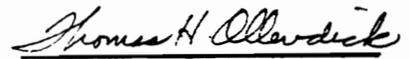
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(ABSTRACT)

Research efforts in the area of eating disorders have been numerous and varied. However, few studies have investigated the existence of specific predisposing factors that could render a young female adolescent more susceptible to developing an eating disorder. The present study was attempted in an effort to fill this knowledge gap. One hundred and fifty nine, 12 to 14 year old female students not known as having an eating disorder, were surveyed at a public school in Roanoke County, Virginia. The participants were asked to complete four different instruments which were: The Piers-Harris Children's Self-Concept Scale, the Children's Assertiveness Inventory, the Nutrition Questionnaire designed by the researchers and the Eating Disorder Inventory or EDI. Correlational statistics were used to identify any significant relationships between the first three instruments and the EDI. Significant relationships were identified, suggesting the existence of specific factors related to

tendencies toward eating disorders as assessed by the EDI. Among these factors were: poor self-concept and body image, obesity and weight problems, active interest or involvement in dieting as well as certain familial behaviors. The results of this research effort will hopefully be used in designing educational programs for the prevention of eating disorders, as well as for enhancing the detection of these disorders. Further research needs will also be suggested.

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INTRODUCTION

Interest in eating disorders has been steadily increasing over the past decade as witnessed by the amount of literature published on this subject every year. This heightened interest could be due to the increased incidence of eating disorders, to the identification of bulimia as a separate disorder, as well as to the development of new treatment approaches that have brought new insights in this field.

According to the Diagnostic and Statistical Manual of Mental Disorders (American Psychological Association, 1980), eating disorders are divided into two major headings: Anorexia nervosa and Bulimia. These two areas are further divided into subheadings depending on the severity and symptomatology of individual cases. Autry et al. (1986) have defined anorexia nervosa as a disorder primarily found in female adolescents that is characterized by severe weight loss due to self-starvation, denial of illness, distorted body image, increased physical activity and metabolic disturbances that can lead to amenorrhea. According to Schlesier-Stropp (1984), bulimia refers to "episodes of gross overeating, followed by vomiting, abdominal pain, laxative use or sleep". The bulimic patient is typically a

white woman in her mid-twenties who began overeating at about age 18 and purging about a year later. According to Schlesier-Stropp (1984), bulimics are obsessed with thoughts of food, eating, vomiting and body weight. These individuals commonly perceive themselves as overweight and have an intense fear of becoming obese. The episodes of bingeing and purging often lead to physical problems as well.

Recent studies have estimated the prevalence of anorexia nervosa in the general population to be between 1.0 and 4.2%, (Katz et al. 1984). Similar studies conducted among college and high school students showed an incidence of 5.9 to 13% for bulimia (Autry et al. 1986). Together, anorexia nervosa and bulimia have been reported to affect 5 to 10% of adolescent girls and young women (Pope Jr. et al. 1984). Szmukler (1985) has suggested that the rates of incidence of eating disorders differ between specific population groups but seem to be increasing over the years. The incidence of eating disorders also seems to be happening earlier and earlier among young females. In a study by Fosson et al. (1987), the mean age of occurrence of the first eating disorder symptoms among the studied population was 11.7 years and the mean age at referral was 12.3 years. Thus, individuals suffering from an eating disorder appear to begin the first related behaviors as young adolescents, especially in the case of anorexia nervosa. However, the

young adolescents age group has not yet been as thoroughly investigated as older groups in the area of eating disorders.

Research in the area of eating disorders has been very diversified due to the complexity of these disorders. Researchers have looked at the clinical symptoms of eating disorders (Crisp and Psych, 1983; Silverman, 1983); their physiological consequences (Weiner, 1983; Matthews et al. 1983); their psychological aspects (Vandereycken and Vanderlinden, 1983; Rothenberg, 1986; Russell, 1985) as well as their epidemiology, prognosis and outcome (Theander, 1985; Szmukler, 1985; Fairburn, 1983; Theander, 1983). Researchers have also investigated the family background of eating disorder patients (Kog et al. 1983; Humphrey, 1983; Gowers et al. 1985) and the different treatment approaches that are being used as well as their outcomes (Hsu and Psych, 1986; Dare, 1983; Autry et al. 1986).

Many investigators have also tried to reach a better understanding of the factors that can lead to the development of eating disorders. Such research is made necessary by the increased incidence of eating disorders and the impact of the disorders on the patients' lives resulting in death in up to 18% of the cases (Theander, 1985). Moreover, until now, the prognosis for eating disorders has been rather

pessimistic (Theander, 1985). Eating disorders have been linked to many factors such as distorted body image (Casper, 1981); fear of sexuality (Herzog and Copeland, 1985); disturbed self-perception or self-concept (Casper et al. 1981); overprotective and overinvolved parents (Humphrey, 1983) as well as many other factors. However, due to the fact that these studies were conducted with persons already suffering from anorexia or bulimia, it is difficult to tell whether the factors cited above are causes or consequences of eating disorders. Did the adolescent first have a distorted body image and disturbed self-concept or were these consequences of her illness? Did the adolescent's eating behavior predispose her toward an eating disorder? The same question may apply to many other psychological or familial findings linked to eating disorders.

There is, therefore a need for identifying predisposing factors that make a person more susceptible to the development of an eating disorder. Such a need is made even more important by the prognosis for eating disorders, the difficult and lengthy treatment processes, as well as the high mortality rate associated with eating disorders. In a study followed by Theander (1985), out of a total group of patients who did recover from an eating disorder, 35% had been ill for six years or more. As the author says: "These patients have obviously lost many years of their youth -

years which would normally have been used for the development of their personalities and the acquisition of social and professional skills".

The purpose of this study was to attempt the identification of some of the predisposing factors that render some people more susceptible to the development of an eating disorder. If such risk factors could be identified, preventive programs could be developed that would address such factors and hopefully avoid the onset of the disorder. Hendren et al. (1986) found the occurrence of eating disorder symptoms so high among a surveyed population of 12 to 18 year old female students (18.37%), the age at onset so young, and peer interaction in the area of dieting so important that they insisted again on the need for developing preventive and educational programs about eating disorders for young girls within their families and school system. The identification of predisposing factors could also help early diagnosis of eating disorders and therefore significantly improve the patient's prognosis since many authors have pointed out that early detection and referral are crucial for a successful treatment of eating disorders (Weeda-Mannak et al. 1983).

The predisposing factors for the development of eating disorders that were investigated were: self-concept, body

image, assertiveness, birth order and the sex of siblings, familial dieting habits and finally, personal dieting practices.

In this study, the following hypotheses were formulated for investigation:

1. A poor self-concept and a poor body-image can increase an adolescent's susceptibility for developing an eating problem that could lead to an eating disorder.
2. Poor assertiveness skills can increase an adolescent's susceptibility for developing an eating problem that could lead to an eating disorder.
3. Birth order and sex of siblings possibly play a role in the development of an eating problem or disorder in a young female adolescent.
4. The overinvolvement of a family in dieting can increase an adolescent's susceptibility for developing an eating problem that could lead to an eating disorder.
5. If a young female adolescent is involved in poor dieting practices, she might be more at risk of developing an eating problem that could lead to an eating disorder.

According to Crisp and Kalucy (1974), profound perceptual disturbances are often found in anorexic patients especially with regard to their body image and body widths. Casper et al. (1981), also mentioned the presence of a poor or

disturbed self-concept in eating disorders patients. The interest in investigating the assertive skills of eating disorder patients stems from the fact that, according to Rothenberg (1986), preoccupation with control is pervasive in the lives and personalities of eating disorder patients who, by pursuing thinness and control of appetite, try to control their environment over which they feel they actually have no control. As already mentioned, most of the studies linking self-concept, body image and control to eating disorders were conducted with patients already suffering from such disorders. Thus, it is difficult to understand whether the above factors are causes or consequences of eating disorders. This study attempted to examine the question of cause or consequence of several variables upon eating disorders.

Interest in the family's dieting practices stemmed from personal observations of eating disorder patients as well as from the fact that this aspect of the eating disorder patient's family has not yet been thoroughly investigated. Birth order and sex of siblings were also considered because of the lack of sufficient knowledge or consensus about their effects on the development of eating disorders. Finally, dieting practices among young female teenagers were also investigated because recent studies have linked weight reduction efforts and effects with eating disorders (Dwyer,

1985, p 20).

Definition of some important terms

The following terms will be used in this study and are defined for clarity.

Amenorrhea: Absence or suppression of menstruation from any cause other than pregnancy.

Binge: Unreserved and often riotous indulgence in or abandonment to any form of activity. Food Binge: Unreserved eating.

Dysphoric mood: An emotional state marked by anxiety, depression and restlessness.

Intrapsychic: From or within the mind or self.

Obsessive-Compulsiveness: Condition characterized by marked constriction of affect, excessive conventionality, perfectionism and moralistic tendencies as well as strong achievement orientation.

Purging: The act or process of cleansing or purifying, the evacuation of feces as a result of disease or of purgation.

Susceptibility: The capacity to be affected by deep emotions or strong feelings. Susceptible to: Liable to be stricken with or by.

REVIEW OF THE LITERATURE

Numerous professional articles have been published on the subject of eating disorders. In this section, studies will be presented in the topic areas of: The nature and characteristics of eating disorders; research needs in the area of eating disorders; perspectives in self-concept and body image; interrelatedness of self-concept, body image, assertiveness and eating disorders; eating and dieting habits and attitudes in relationship to eating disorders; and the prognosis of eating disorders.

THE NATURE AND CHARACTERISTICS OF EATING DISORDERS

Many authors (Autry et al. 1986; Herzog and Copeland, 1985) have described anorexia nervosa as a syndrome or disorder characterized by extreme weight loss due to self starvation, an intense fear of becoming obese, and body image disturbances. The term anorexia nervosa originally meant a nervous loss of appetite. However, for Dwyer (1985, p 20), this term is quite inadequate because anorexic patients do not necessarily lack appetite; rather, they willfully restrict their food intake even when hungry. Anorexia mostly

affects white, middle class female adolescents but it also occurs in other population groups. Anorexia often develops in a teenage girl who is or was or perceives herself as overweight. The original dieting effort soon turns into severe food restriction as well as an obsession with maintaining a low body weight (Herzog and Copeland, 1985). The failure to eat is accompanied by other behavioral changes whereby anorexics develop ritualistic practices concerning eating, insist that they do not need care and are often proud of the rigid discipline that they are imposing on themselves (Dwyer, 1985, p 20). According to Herzog and Copeland, (1985), anorexics can be subdivided into two groups: the restrictive anorexics who pursue weight loss by severe restriction of caloric intake and the bulimic anorexics who alternate severe food restriction with periods of binge eating followed by self-induced vomiting or the use of laxatives or diuretics. Anorexia nervosa patients usually have a high level of physical activity as an additional method to lose weight.

Bulimia is a syndrome distinct from anorexia nervosa and is characterized by gross overeating or binging followed by self-induced vomiting and laxative use or purging (Herzog and Copeland 1985). The same authors also indicate that both binging and purging are usually very secretive because of the feelings of shame and humiliation that often follow

them. The onset of bulimia usually takes place later in adolescence and, unlike anorexia, is not usually accompanied by withdrawal and asexuality. According to Schlesier-Stropp (1984), there seems to be a high incidence of alcoholism and weight problems in first degree family members of bulimics. Dwyer, (1985, p 20) has also suggested that the long-term outcome of bulimics is poorer than for anorexics because of the other problems they commonly face such as mood disorders, suicide attempts and alcoholism.

Russell (1985) has recently suggested that anorexia nervosa has undergone important changes through the last decade to become "a morbid preoccupation with body weight and the dread of fatness". As evidences of the changes in anorexia nervosa, the author cites the increased incidence of the disorder, the alterations in its central psychopathology and the changes in its form with the emergence of bulimia nervosa. He suggests that heightened social pressure for women to have slim bodies, especially when the focus is upon young girls at increased vulnerability, is responsible for the increase in the incidence of anorexia nervosa. Furthermore, Russell believes that fear of sexuality has become a secondary feature of anorexia nervosa, whereas distorted body image that makes the patient view herself as wide and fat has become a primary feature of the disorder.

Rothenberg (1986), hypothesized that eating disorders are a form of obsessive-compulsiveness. He suggested that body shape images, dieting practices and drive for thinness as it is imposed by western societies, all play roles in producing such obsessive-compulsiveness. In both anorexia nervosa and bulimia, there is a constant preoccupation with foods and calorie counting in order to achieve thinness. However, according to the author, the preoccupation far exceeds the goal and soon gets out of control. Rothenberg then lists some of the features of obsessive-compulsiveness that are also found in eating disorders such as perfectionism, excessive orderliness and cleanliness, negativism and rebelliousness.

There have also been studies that attempted to investigate the family background and the demographic patterns of eating disorder patients. According to Gowers et al. (1985), there is no conclusive evidence that eating disorder patients have a specific birth order. A study conducted by this group in England investigated the assumption that there is a preponderance of female siblings in the families of anorexic patients and that these patients tend to be the youngest child. Retrospective analysis of case notes was used to obtain the sex of the patient, the ordinate position of the patient within the family and the number and sex of siblings. The results did not indicate the existence of a

particular pattern with regard to siblings of either sex or birth order.

Researchers have also looked at other characteristics of the families of eating disorder patients. A study in London by Fosson et al. (1987) had among its objectives an interest in investigating the family characteristics of 48 children with early onset anorexia nervosa. Distortion in family interactions was found to be common and included some of the following traits: overinvolvement which leads to lack of privacy for individual family members, pervasive communication problems and inadequate or inconsistent parenting. The researchers concluded from the results of this study that parents are more likely to be intrusive and authoritarian with girls and youngest children and more resistant to their emancipation. Some of these children will then attempt to solve these conflicts by shifting the controversy to control of food intake.

RESEARCH NEEDS IN THE AREA OF EATING DISORDERS

According to Eisele et al. (1986), most research about eating disorders and factors related to eating disorders has been conducted with college women. But, as these authors

point out, early adolescence seems to be the most common age for the onset of eating disorders. Thus, they concluded that there is still a strong need for researching eating disorders with young female adolescents even as young as 12.

Several studies or reviews have indicated a need for future research in the area of eating disorders that would lead to early detection or even prevention of eating disorders. Autry et al. (1986), have stressed the need for research that would address the "psychological factors that influence the development and maintenance of anorexia nervosa" and the influence of the family on a person's eating habits and food beliefs.

Weeda-Mannak et al. (1983) have stressed the importance of early detection and intervention for the successful treatment of anorexia nervosa. These authors propose that, the earlier the detection and referral, the better the prognosis. Szmukler (1985) has also expressed the need for early intervention at the "hazardous dieting" stage, before the eating disorder has had time to develop. Most of these concerns with early intervention stem from the fact that the treatment for eating disorders is a lengthy and difficult process which, in many cases, does not lead to complete recovery. Rothenberg (1986) has later suggested that the obsessive-compulsive patterns present in eating disorders

can explain the low recovery rate from these disorders since obsessive-compulsiveness patterns have always been difficult to treat whether through psychological, social or biological methods.

The need for further investigation of the relationship between body image, self-concept and eating disorders can be inferred from many previous research efforts such as the study by Slade (1973) where anorexic girls were asked to estimate their body widths. They overestimated these widths by 27% to 58% while normal girls were found to have a very accurate estimation of their body image. According to the same author (1985), more than 50% of anorexics overestimate their body size when using image distorting methods. Bruch (1974) also states that "a realistic body image concept is a precondition for recovery from anorexia nervosa". Russell (1985) has emphasized the need to research pathoplastic causal factors of eating disorders which, he believes, are vulnerable personality and socio-cultural influences.

According to Mallick et al. (1987), one of the most efficient ways of differentiating between a real and a mimicked eating disorder among young adolescents is to examine the emotional status of the patient. If the patient is only experiencing a derangement in menstrual and dieting patterns, the presence of an eating disorder would be unlikely.

But if psychopathologic symptoms, confusion about body boundaries, poor affective control, loneliness, isolation and severe emotional fluctuation are also present, then the diagnosis of an eating disorder would be much more likely. Since a person's self-concept is what determines many of the above characteristics as well as overall emotional status, studies of self-concept in eating disorder patients are essential to address this whole issue.

As another aspect of the personality of eating disorders patients, assertiveness skills also need to be investigated. Rothenberg, (1986) has suggested that most eating disorders patients feel that they have no control on their environment. Furthermore, no extensive studies are yet available in this area.

Previous studies have also emphasized the need for further investigation of the family patterns of eating disorder patients. Strober et al. (1985) have investigated the hypothesis that eating disorders tend to aggregate in the same families. In a study that took place in California, the lifetime prevalence rate of anorexia and bulimia nervosa in first and second degree relatives of anorexic and bulimic patients was compared to the rate of occurrence of these disorders in relatives of a matched control group of non-anorexic but psychiatrically ill patients. Findings indi-

cated that female relatives of anorexic and bulimic patients had a three fold greater risk of developing anorexia nervosa and a 2.5 fold greater risk of developing bulimia nervosa, as compared to the female relatives of the control group. Thus, this study tends to support the hypothesis that eating disorders are familial, even though the reasons for this are not yet known. The reasons may lie in specific psychological or familial vulnerabilities or a mixture of both.

Few studies investigating the relationship between dieting habits and eating disorders are now available. Even though some studies have recently connected weight reduction efforts with eating disorders (Dwyer, 1985, p 20), little is still known on this subject. Therefore, there is a strong need for the study of dieting as a risk factor for eating disorders especially considering that dieting itself is a crucial part of eating disorders and one of the most difficult practices for the patients to change.

PERSPECTIVES IN SELF-CONCEPT AND BODY IMAGE

Self-concept is generally viewed as a valued research outcome by itself because it is assumed that improvement of

self-concept may lead to improvements in other areas (Marsh et al. 1983). According to many authors (Shavelson and Bolus 1982; Marsh et al. 1983), self-concept is a person's perception of him or herself and this perception is formed through experience with and interpretations of one's environment. Self-concept is also influenced by interactions with significant others, their evaluations or reinforcements (Shavelson and Bolus, 1982).

A study was conducted in California by Shavelson and Bolus (1982), to advance self-concept theory by testing some of its critical assumptions. Ninety nine junior high students were asked to complete "The Way I Feel About Myself" scale and the Tennessee Self-Concept scale as measures of self-concept. Other tests were used as measures of academic self-concept which refers to how students view their academic achievements. Analysis of the results indicated that overall self-concept can be interpreted as distinct from but correlated with academic self-concept and that specific subject matter self-concepts are distinct from but correlated with academic self-concept. Self-concept also appeared to be a hierarchical construct with general self-concept at the top and situation specific self-concepts at the base. Finally, the results tended to indicate that self-concept demonstrates a causal relationship with achievement.

In a study conducted in Sidney, Australia, Marsh et al. (1983) attempted to investigate the hypothesis that self-concept should be correlated with abilities in areas perceived as important to a person. Fourth, fifth and sixth graders were asked to complete the Progressive Achievement Test and the Self Description Questionnaire. The results indicated that students' self-concepts in specific areas were internally consistent and stable over time and were also correlated to a variety of criterion variables such as teachers' ratings of the student's self-concept. Specific factors of self-concept were strongly correlated with variables to which they were related. The results of this study provided strong support for the construct validity of self-concept.

Dusek and Flaherty, (1981) have suggested that researchers have failed to assess the continuity/discontinuity and stability/instability aspects of the development of self-concept during adolescence. This, they say, has led to the stereotype of adolescence as a time of significant change in self-concept. A three year longitudinal study with students in grades five to twelve was conducted by Dusek and Flaherty (1981) in order to investigate the above issue. The survey instrument was a semantic differential scale and the concept rated was "my characteristic self". The results of the study did not support discontinuity views of adolescence.

Rather, the adolescent self-concept was seen as the result of continual and gradual growth not only based on social circumstances but also on emergent cognitive skills.

Body image is another area of self-perception that has been of great interest to researchers. Van der Velde (1985) has proposed that humans are not capable of forming one complete image of their body. He suggested that our self body image is a "conceptual composite of innumerable body images". He also suggested that body images are associated with others' appraisals to one's appearance and actions and that one's perception of physical self also includes the perception of the appearances of others. Van der Velde then hypothesized that bodily appearances are essential for the occurrence of human interactions since the body is the only medium for human psychological transactions. According to the author, extraneous body images mediate the development of basic trust, attachment, and human interactions. Extraneous body images are also seen as laying the foundations of our concept of others. The author also believes that a man's conception of his own body image forms the foundation for his self-concept and serves as the basis of man's social behavior. In conclusion, the author states that body images determine the uniqueness of human behaviors and the development of personality traits.

INTERRELATEDNESS OF SELF-CONCEPT, BODY IMAGE, ASSERTIVENESS
AND EATING DISORDERS

Weinreich et al. (1985) believe that researchers have so far neglected the study of the self-concept of individuals who develop anorexia or bulimia nervosa. They also suggest that psychosocial and developmental factors fuel identity problems within a person and that these identity problems are partly resolved through weight control. Moreover, Casper (1983, p 388) states that "the lack of a stable self-concept and secure self-regard predisposes adolescents to use thinness in a misguided strife for individuation".

Using the "Identity Structure Analysis", Weinreich et al. (1985) tried to assess the identity of eating disorder patients through their identification or dissociation from significant others in their lives. The study was conducted in England and compared 26 females with anorexia or bulimia nervosa with 12 psychiatrically ill female patients and 13 normal female controls. It was found that anorexics had devaluated self-images, conflicts in identification with maternal metaperspectives (patients' perception of how their mothers view them) as well as a strongly diminishing self-evaluation. Bulimics also manifested low self-evaluation but seemed to have developed limited adaptation over conflicts

in identification with metaperspectives of self. Anorexics had a much lower self-evaluation than bulimics but for both, paternal metaperspectives were devaluated and conflicted.

The study of personal constructs in eating disorder patients has also been of major interest during the past years. In England, Moltram (1985), investigated the occurrence of such constructs in 15 female anorexia nervosa patients and a matched control group. The constructs studied were: independent/dependent; sexually attractive/not sexually attractive; mature/immature; successful/failed. Twelve different elements were used on the questionnaire in order to investigate the constructs. The results indicated that anorexia nervosa patients tended to have an unidimensional mode of thinking or thinking in absolutes due to their obsessionality with food and body weight and also due to the fact that they tended to see the world and themselves as one extreme or the other with no middle ground. The anorexic group's "ideal self" was seen as a total change from the "present self" which indicates that these girls were striving towards the perceived perfection of other people in the face of their own low self-esteem. Alienation and isolation were also found among the anorexic group.

Another group of researchers (Swift et al. 1986) recently investigated the psychological self-image of adolescent

anorexics. In this study, two self-report measures: the Offer Self-Image Questionnaire (OSIQ) and the Structural Analysis of Social Behavior SASB-Introject were administered to 30 hospitalized female adolescent anorexics in Wisconsin. The OSIQ consists of 130 self-referential items which measure adjustment in 11 content areas considered important in adolescence. The SASB is a model for defining and measuring social behavior and self-concept. In this study, only the SASB-Introject was administered because it describes the intrapsychic effect when a person focuses on the self as an object. Analysis of the OSIQ results indicated good adjustment, as defined by the authors, in the areas of moral, impulse control, and educational goals but very poor adjustment in the areas of emotional tone, body and self-image and sexual attitudes. This unusual OSIQ pattern seems to be unique to anorexics. Analysis of the SASB-Introject indicated that the subjects were self-restraining and self-attacking or self-hating. Good adjustment on the OSIQ scales appeared to be highly correlated with low self-attack on the SASB-Introject. The most striking findings of this study were the poor adjustments in body and self-image and the intensity of self-hate in anorexic adolescent females.

Casper et al. (1981) have also suggested that, in the area of eating disorders, achieving slimness enhances the

person's satisfaction and self-esteem. The authors conducted a study in Chicago with 30 female adolescents suffering from acute anorexia nervosa who were further subdivided into an early group and a late group according to their ages. The Offer Self-Image Questionnaire was used to measure the self-concept of the subjects because self-concept was considered as a crucial personality dimension for adolescents and because it has been correlated with their mental health and adjustment. The anorexic patients, in contrast with normal adolescents, were found to be characterized by a predominance of distressing effects, poor self-concept, insecurity in social relationships, and a sense of inadequacy in approaching sexual issues. In addition, older patients showed significantly more disturbed impulse control, self-perception, and body image than the early group.

Smart et al. (1976) conducted a study in South Africa with 22 post pubertal female patients who were being treated for anorexia nervosa. The subjects were asked to complete three personality inventories and an intelligence test. Their scores were compared with the scores of a matched normal control group. The anorexic patients were found to be significantly more neurotic, more anxious, more independent and less extraverted than normal subjects. They also manifested marked obsessional features and were of normal

intelligence. However these results might be due in part to the fact that the patients were severely ill.

In relationship to the investigation of the self-concept of eating disorder patients, many researchers have specifically looked at the body images of these patients. Crisp and Kalucy (1974) have conducted two major studies in London which provided other researchers with increased insights on the role of body image in eating disorders. The first study investigated the extent to which anorexic patients overestimate their body widths depending on the experimental context and before and after normal body weight was restored. At first contact, the overestimation was about 65% but following an invitation by the counselor to be less defensive, it went down to 40%. After normal body weight was restored, the overestimation was 35% but following the invitation to be less defensive, it went down to 13%. Restoration of normal body widths estimation seemed to be linked to recovery and good prognosis for the future. The second study investigated the relationship between the nature of a recently ingested meal and the changes in body widths that anorexic patients perceived as happening. The patients reported a large increase in body widths after a high carbohydrate meal even though both had the same caloric content. The authors of the study believe that this last finding stems from the patient's conviction that it is a major

restriction of carbohydrates in the diet that can lead to weight loss.

According to Slade (1985), a tendency for overestimation of body size among eating disorders patients has been related to: 1) the presence of vomiting and bulimia nervosa, 2) poor response to inpatient treatment and 3) increased psychopathology and lack of self-control. Thus, overestimation of body size seems to be associated with a more severe illness and seems indicative of a poorer treatment outcome.

More recently, Grant and Fodor (1986) attempted to investigate the relationship between adolescent's attitudes toward body image and tendencies toward anorexic behavior. In this study, body image was measured on the Lerner Scales and tendencies toward anorexic behavior on the Eating Attitudes Test or EAT and the Eating Disorder Inventory or EDI. The Lerner Scales measure three dimensions of body image: physical attractiveness, self-esteem and physical effectiveness. The EAT indicates the presence of anorexic symptoms and the EDI measures the psychological characteristics related to anorexia and bulimia. One hundred and sixty-eight high school students from both sexes and within an age range of 15 to 18 took part in the study and completed the above instruments. Female students scored significantly higher on the dimension of physical attractiveness whereas

male students scored significantly higher on the dimension of physical effectiveness. Females' mean response on the EAT was twice the mean response of males. An inverse relationship was found between physical attractiveness and tendencies toward anorexic behavior. Self-esteem was found to be the most important predictor of the tendency toward anorexic behavior, followed by physical attractiveness. The results of this study tend to support the hypothesis that self-esteem and physical attractiveness are associated with eating disorders in adolescents. The authors indicated that further research is still needed in this area.

There have not been extensive studies conducted in the area of assertiveness and eating disorders. However, anorexia nervosa has often been identified as "the unprepared adolescent's response to puberty's demand for separation and individuation from overinvolved, overprotective parents" (Humphrey, 1983). In that context, the development of an eating disorder could be partly due to the unsuccessful attempt of the adolescent to assert him or herself in an overly controlled environment. Moreover, it has been hypothesized that weight loss and a rigid food discipline give anorexics a sense of effectiveness and control in at least this one area of their lives and that, from the need to assert themselves stems their resistance to therapy and their insistence that they do not need any care (Dwyer,

1985, p 20).

EATING AND DIETING HABITS AND ATTITUDES IN RELATIONSHIP TO EATING DISORDERS

Few studies are available that investigate the relationship between eating attitudes, food consumption patterns, and dieting on the one hand and eating disorders on the other. According to Dwyer (1985, p 20), whether dieting to lose weight is a cause or a manifestation of anorexia nervosa is still in question. He adds that current evidence suggests that dieting is not sufficient in itself to cause anorexia but that the thoughts, attitudes and behaviors associated with dieting may increase the risk of developing an eating disorder.

There is evidence that dieting to lose weight is increasingly common at all ages but particularly among adolescent females and that non-traditional diets that combine weight reduction with other eating practices are also prevalent (Dwyer, 1985, p 20). Recent research efforts have connected weight reduction efforts with eating disorders. According to Johnson (1982), restrictive reducing diets often precede the onset of binges in bulimic individuals.

Attitudes toward food and eating among eating disorder patients have also stimulated the interest of researchers in this field. Various studies have suggested that, even when anorexics reach and keep a stable weight and normal menstrual functioning after treatment, they are still troubled by distorted attitudes to food, eating and weight (Garner and Bemis, 1982; Crisp et al. 1980).

In 1986, Clinton and McKinlay attempted a study to evaluate whether anorexic patients who could be considered as recovered according to several criteria would still manifest distorted attitudes to food, eating and body weight at follow-up. The study, which took place in Glasgow included 15 acutely ill female anorexics, 14 former female anorexics, 10 female psychiatric controls and 24 normal female nursing students. The subjects were asked to complete the following instruments: the Eating Attitudes Test or EAT which is a 40 item measure of the symptoms of anorexia nervosa and the Crown-Crisp Experiential Index or CCEI which surveys general anxiety, phobic anxiety, obsessionality, somatic complaints, depression and hysteria. Among other results, the researchers found that acutely ill anorexics had significantly higher EAT scores than the two control groups but did not differ from the recovered anorexics scores. The recovered anorexics had significantly higher EAT scores than normals but did not differ from the psychiatric controls. Acutely

ill anorexics, recovered anorexics and psychiatric controls all had significantly higher scores than normals on the CCEI. The major implication of this study is that the distorted attitudes toward food, eating and body weight that are associated with anorexia nervosa remain even after treatment and discharge. Do these distorted attitudes slow down treatment or increase the risk of relapse? More research is needed in this area before such a question could be answered.

THE PROGNOSIS AND OUTCOME OF EATING DISORDERS

Follow-up studies of anorexia nervosa have demonstrated a varying mortality rate ranging from 0 to 22% (Schwartz and Thompson, 1981). In a longitudinal study conducted with 151 anorexic patients who were followed for 4 to 22 years, a mortality rate of 5.96% was reported (Isager et al. 1985). Within this group, the hazard of death was estimated to be around 0.5% per year and the hazard of relapse around 3% per year. The risk was found to decline steadily after therapeutic contact.

Theander (1985), recently presented the primary results of a long term Swedish study of the outcome of eating disorders.

In this study, 94 anorexia nervosa patients were followed and evaluated after 5, 15 and 33 years. Most of the follow up and evaluations were conducted through a direct interview in a semi-clinical setting. At the time of the report, 76% of the patients had recovered, 35% of whom had been ill for 6 years or more; 18% of the patients had died; and 6% were still in poor condition. Recovery after 12 years of illness was uncommon. It was also observed that older age at onset, occurrence of bulimia and vomiting as well as overestimation of body size all lead to a poor prognosis and an unfavorable outcome.

Martin (1985) has also reported that patients who experience bulimic episodes have the poorest treatment outcome. Furthermore, he suggested that early onset anorexia nervosa, if coupled with early intervention, is associated with good treatment outcome and thus, an optimistic prognosis. Another outcome study by Abraham et al. (1983) was conducted with 43 bulimia patients who were evaluated 14 and 72 months after presenting for treatment. The evaluation was accomplished using a clinical interview, self completion of a questionnaire, self-rating and the Eating Visual Analogue. After the evaluation, the investigators found that 29% to 42% of the patients could be considered cured. Only the onset of binge eating before the age of 16 was indicative of a good outcome.

SUMMARY AND PURPOSE

The Review of Literature has focused upon research in topic areas related to eating disorders that will serve as a foundation for the present study. The development of this theoretical base will provide direction for the investigation of the research hypotheses.

MATERIALS AND METHODS

POPULATION

The target population of this study was young girls between the ages of 12 and 14. A representative sample of this age group was surveyed at one junior high school in Roanoke County, Virginia. This school was identified by the supervisor of health of the local school division as being representative of the school population across the county in terms of socioeconomic status, race, population density and academic background. Only the girls were surveyed since approximately 90% to 95% of the anorexic and bulimic population is female (Garfinkel and Garner, 1982; Herzog et al. 1984). The total number of girls who answered all the questionnaires and fell within the preset age group was 159 out of an approximate 180. The students were members of the nine classes of seventh, ninth and eighth graders which were in their Physical Education cycle of classes. All the participants had had their parents sign an approval form allowing them to take part in the study. The girls that were not included in the study were either absent or had not returned the parental approval form.

THE INSTRUMENTS

Four instruments were used in this survey: the Piers-Harris Children's Self-Concept Scale, the Children's Assertiveness Inventory, The Eating Disorder Inventory and a specifically designed Nutrition Questionnaire.

The Piers-Harris Children's Self-Concept Scale

The Piers-Harris Children's Self-Concept Scale is an "80-item, self-report questionnaire designed to assess how children and adolescents feel about themselves" (Piers, 1984). In this instrument (Appendix A), there are six "cluster scales" which are: Behavior, Intellectual and School Status, Physical Appearance and Attributes, Anxiety, Popularity, Happiness and Satisfaction. A high score on a particular cluster scale indicates a high level of assessed self-concept within that specific dimension.

According to the Scale's manual (Piers, 1984), the Children's Self-Concept Scale can be used as a screening instrument in high risk settings along with other methods of assessing children's self attitudes. However, it was primarily designed to be used as a research instrument which would provide a quantitative self-report measure of

children's self-concepts and would help in investigating the relationship between self-concept and other traits or behaviors. The Piers-Harris Scale can be used with children between the ages of 8 and 18. According to Chiu (1988), the Children's Self-Concept Scale has been regarded as the most psychometrically sound instrument for assessing children's self-esteem. Therefore, he highly recommends it for use as a research tool.

The Children's Self-Concept Scale has been used by many researchers since it was developed and its uses have been quite varied. In a study by Silverman and Zigmond (1983), the Piers-Harris scale was used to compare the self-concept of learning disabled adolescents with the self-concept of normal adolescents. The intent of the study was to test the assumption that learning disabled adolescents have a poorer self-concept. The results of the study indicated that mean self-concept scores of learning disabled adolescents were comparable to those of normal adolescents. Therefore, the assumption was rejected. The Piers-Harris Scale has also been used by many researchers to assess the effectiveness of a specific treatment on the improvement of children's self-concept. A study by Gianotti and Doyle (1982) was designed to determine if the Parent Effectiveness Training Program would lead to an improvement of the self-concept of learning disabled children. Along with other instruments, the Piers-

Harris Scale was administered to the children before and after the parents went through the training program. The Piers-Harris results yielded a statistically significant difference indicating that the children whose parents went through the training had a significant increase in self-assessed self-concept as compared to children whose parents did not go through the program.

In the present study, the original coding method designed by the authors of the scale was slightly modified. Throughout the instrument, the only possible answers for each question are either Yes or No. According to the authors' coding method, the answer that is related to a positive self-concept receives a score of 1 whereas the other answer does not receive a score. Missed or skipped questions also do not receive a score. The researchers were concerned about the fact that undesirable answers and missed answers were receiving the same score and feared that such scoring could lead to misleading total raw scores. A missed answer should not be scored as an answer related to a negative self-concept since it does not indicate the same thing. Rather, the total raw score should be adjusted for missing answers so that it still accurately reflects the respondent's self-concept. Therefore, the researchers decided to give a score of 2 to the desired answers and a score of 1 to the undesirable answers so that the latter could be differentiated

from missing answers which would be reflected by a zero.

The Children's Assertiveness Inventory

The Children's Assertiveness Inventory has been designed to measure positive and negative assertion in children (Appendix B). For the purpose of this inventory, assertiveness was defined as "the ability to express one's thoughts and feelings, both positive and negative, in a non-hostile way and without violating the rights of others" (Ollendick, 1984). The questionnaire was designed with the help of a number of children and four qualified judges and included 14 items depicting social situations involving assertive responding among peers. The 14 items were divided into two scales: a positive assertiveness scale testing assertive skills in positive situations, such as receiving compliments and a negative assertiveness scale testing assertive skills in negative situations, such as being taken advantage of. A high score on both scales indicates high assertive skills. After it was designed, the inventory was administered to three samples of normal children from different socio-economic or racial backgrounds and from both sexes. The results reflected no differences as related to sex, race or socio-economic status but did differ with age. Further tests indicated that the inventory is reliable over time and has a modest internal consistency and a high re-test relia-

bility coefficient. Self-report assertiveness was found to be inversely related to trait anxiety and external locus of control and positively related to self-concept. The scores of normal children differed significantly from the scores of socially withdrawn children. These findings indicate that the inventory has both reliability and validity and can be used as a clinical and research instrument. Further details of the development and validation of this inventory can be obtained from the test developer's own review of the inventory (Ollendick, 1984).

The Eating Disorder Inventory or EDI

The EDI was constructed to assess certain psychological and behavioral traits commonly encountered in eating disorder patients (Appendix C). The EDI is a 64-item, self-report measure consisting of eight scales that measure: Drive for Thinness, Bulimia, Body Dissatisfaction, Ineffectiveness, Perfectionism, Interpersonal Distrust, Introceptive Awareness, and Maturity Fears. A high scale score indicates a higher potential for the presence of an eating disorder. The EDI can be useful as a screening tool or as an outcome measure but should not be used as a diagnostic instrument for anorexia nervosa or bulimia (Garner and Olmsted, 1984). The EDI can be administered both to individuals and groups and to respondents as young as 12 years of age.

As indicated by the authors of the EDI (Garner et al. 1984), the inventory has been used as a screening tool as well as an outcome measure. In a study by Johnson and Flach (1985), where the purpose was to explore the differences in psychological parameters of bulimics' families versus normal control families, the EDI was used as an assessment tool to further distinguish between the bulimic and the normal samples. Bulimic subjects scored significantly higher than the control sample on all eight scales of the EDI. In another study by Connors et al. (1984), which was undertaken to assess the outcome of a multidimensional group treatment program for bulimic women, the EDI was used as an outcome measure. The bulimic subjects were asked to complete the EDI along with other self-report measures, both before and after the treatment. Scores on several scales of the EDI improved significantly after the treatment but did not do so on other scales. Therefore, the use of the EDI in this study helped in measuring the effectiveness of the treatment program. According to Garner et al. (1984), the EDI can also be used as an aid in typological research.

In the present study, the test developers' scoring method for the EDI was not used by the researchers for the statistical analysis because it was considered as very clinically oriented, and the researchers had concluded that it was not adequate for research involving large groups of partici-

pants. Throughout the EDI, the possible answers for each question are: always, usually, often, sometimes, rarely and never. Because the main goal of the authors of the EDI was to use the Inventory as a clinical tool to help in the screening of potential eating disorder patients, they decided to give a zero score to never, rarely and sometimes if the question addressed an undesirable behavior and 1, 2, 3 scores to the next three answers. The scores were reversed if the behavior was desirable. This method was designed so that high scale scores would indicate a higher potential for the presence of an eating disorder. However, the present researchers believe that, for research purposes, this scoring method is not desirable because it ignores half of the data. Moreover, since the researchers were mostly interested in identifying people at risk of developing an eating disorder, they could not equate a "never" answer with a "rarely" or "sometimes" answer, especially for questions such as "I stuff myself with food" or "I feel extremely guilty after overeating". Even if "sometimes" or "rarely" answers would not suggest the presence of an eating disorder, they could suggest a risk or a potential problem, whereas "never" would not. Therefore, the researchers decided to use a method developed by Dr. Robert Frary (1).

(1) Assistant Director for Research and Measurements, Learning Resources Center. Virginia Polytechnic Institute and State University.

According to this new scoring method, the answers' scores range from 1 to 6 with 1 indicating the most desirable answer. High scale scores will still indicate a higher potential for the presence of an eating disorder. This new scoring method should insure more sensitivity in evaluating the participant's answers and provide a more complete set of data because no answers would be given a zero score.

The original scoring method designed by the authors of the EDI was only used to allow a comparison between the scores of the present study's population and the norms established by the EDI's authors.

The Nutrition Questionnaire

The Nutrition Questionnaire or NQ was specifically developed by the researchers to serve the purposes of the study (Appendix D). Its aim was to obtain from the participants information about their familial demographics and dieting habits as well as their own dieting habits and eating behaviors. The NQ includes 97 questions that were developed based on the professional literature and the information sought. The NQ was reviewed for possible scale development based upon the face validity of the questions. Three groupings of questions emerged. The following is a description of these three subgroups and how they were scored.

The first group of questions or the "Eating When Dieting" scale included questions 58, 60 to 65, 67 to 74 and 76 to 80. These questions were grouped into one scale because they represented potential eating habits of dieting teenage girls in the U.S. There were four possible answers for each of these questions: "never", "once a week", "three times a week" and "daily". The possible score for each answer ranged from 1 to 4 with 1 being the least desirable score and 4 the most desirable score. If a question addressed a desirable eating habit when dieting, then "never" would receive a score of 1, "once a week" a score of 2, "three times a week" a score of 3 and "daily" a score of 4. Such scoring was used, for example, with question 69 "Do you drink skim milk". If a question addressed an undesirable eating habit when dieting, then the scores were reversed. Such was the case for question 60 "Do you skip breakfast" where "never" received a score of 4, "once a week" a score of 3, "three times a week" a score of 2 and "daily" a score of 1. The score given to each answer was based on whether that answer indicated sound or poor dieting practices. The judgment as to whether an answer reflected a sound or a poor nutritional practice was based on nutrition references (American Dietetic Association, 1981; Krause and Mahan, 1979). A high score on this scale would indicate nutritionally balanced eating habits when dieting, whereas a low score would indicate poor eating habits when dieting.

The second group of questions or the " Dieting Behavior" scale included questions 45, 46, 47, 88, 89, 93, 94, 95, and 96. These questions were grouped together because they all investigated specific behaviors related to dieting rather than non-dieting eating habits. There were two possible answers for each question: Yes or No. The possible score for each answer was either 1 or 2, with 1 being the least desirable score and 2 the most desirable score. If a question addressed a desirable dieting behavior, then "Yes" received a score of 2 and "No" a score of 1. Such was the case for question 45: "If on a diet, do you try to eat smaller helpings". If a question addressed an undesirable dieting behavior, then "Yes" received a score of 1 and "No" a score of 2. Such was the case for question 94 "If dieting, do you take appetite suppressant pills". The judgment as to whether an answer reflected a sound or poor dieting behavior was based on the nutrition references listed earlier. A high score on this scale would indicate a nutritionally balanced dieting behavior, whereas a low score would indicate poor dieting behavior.

The third group of questions included questions 1 to 44, 48 to 57, 59, 66, 82, 83, and 97. When looking at this group of questions, the researchers' goal was not to evaluate the soundness of the answers but rather to try to distinguish trends in the participants' familial demographics such as

birth and sex of siblings as well as eating and dieting patterns in which the family and the participant engaged. Therefore, only totals and percentages were allocated to the different answers. Then, these totals and percentages were compared to the participants' scores on the three other instruments, and the existence of possible trends was investigated.

Since the Nutrition Questionnaire had been devised by the researchers for the purpose of this study and since it had never been used before, there was a need to determine its reliability. Therefore, this questionnaire was administered twice to 102 participants out of 159. The answers obtained from the two different administrations were then compared and the reliability of the questionnaire evaluated.

THE SURVEY PROCEDURE

The female students of nine junior high school Physical Education (PE) classes were surveyed by the researchers over four non-consecutive days. On November 11th, 1987, one ninth grade class and one seventh grade class were surveyed. The two classes, which met separately, were asked to complete the EDI and the NQ. On November 23rd, 1987, one

ninth grade, four eighth grades and two seventh grades were surveyed. They all met with the researchers at their regular scheduled PE hour and were also asked to complete the EDI and the NQ.

On December third, 1987, the ninth and seventh grade classes that were surveyed on November 11th, met again with the researchers. They were asked to complete the Assertiveness Inventory and the Piers-Harris Children's Self-Concept scale. On December seventh, 1987, the ninth, eighth and seventh grade classes that were surveyed on November 23rd, met again with the researchers. They were also asked to complete the Assertiveness Inventory and the Piers-Harris scale. When this last group of students finished completing these two scales, they were asked to complete the NQ a second time in order to determine its reliability.

All of the participants answered the questionnaires on Opscan sheets and not on the questionnaires themselves. Standardized instructions for each instrument were read to each class prior to administering these instruments. The students were always told that there were no right or wrong answers and that they had to check the answers that corresponded most to the way they felt or thought or acted. All students were given code numbers so that their answers would be confidential. They kept the same code number for all the

questionnaires in order to allow the use of correlational statistics between the different instruments.

THE STATISTICAL ANALYSIS

The first step in the analysis of the results was the coding of all questionnaires. Since all the students had answered the questionnaires directly on Opscan sheets, no individual coding was needed and the raw data were entered on the computer. Three of the instruments used: the EDI, the Piers-Harris Scale and the Assertiveness Inventory were standardized tests that already had standardized answer keys. These answer keys as well as the modified answer keys for the EDI and Piers-Harris Scale were also entered on the computer. As mentioned earlier, the EDI was scored by both the original and the modified methods, whereas the Piers-Harris Scale was only scored using the modified method. Finally, the coding method for the NQ developed by the researchers was entered on the computer.

The second step of the analysis was to obtain the total raw scores and scale scores for all four questionnaires. At the same time, the reliability coefficients were obtained for

the NQ as well as the test retest reliability.

The third step of the analysis was to perform correlational statistics between the four different instruments. The eight different scales of the EDI were compared to the six different scales of the Piers-Harris Scale, to the two scales of the Assertiveness Inventory and to the two scales of the NQ. The eight scales of the EDI were also compared to specific questions on the NQ that were not included in either one of its two scales. The Pearson Correlation Coefficient was obtained for each of these comparisons. The researchers' main interest was to look at these correlation coefficients and comment on those that were significant in relationship to the research hypotheses stated in the Introduction chapter. These hypotheses were that a poor self-concept, a poor body image, poor assertiveness skills, overinvolvement of a family in dieting and poor individual dieting practices can all increase a young girl's susceptibility to developing an eating disorder which would be reflected in a higher EDI score. It was also hypothesized that birth order and sex of siblings might play a role in the development of an eating disorder.

For the purpose of interpreting outcomes, only those coefficients lower than -0.3 or higher than $+0.3$ with a significance level of at least 0.01 were investigated. Correla-

tion coefficients in the order of -0.29 or $+0.29$ were considered only if they were supporting other correlations within the pre-identified significance levels.

RESULTS AND DISCUSSION

This chapter will comprise five sections. In the first section, the mean scores of the surveyed population on three of the instruments used will be presented. The second section will deal with the relationships between the Eating Disorder Inventory (EDI) and the Piers-Harris Children's Self-Concept Scale (P-H Scale). The third section will cover the relationships between the EDI and the Assertiveness Inventory. The fourth section will be devoted to the results obtained from the Nutrition Questionnaire (NQ) and their relationship to the EDI. Finally, in the fifth section, the results of the analysis will be related to the research hypotheses stated in the Introduction chapter.

MEAN SCORES OF THE SURVEYED POPULATION ON THE PIERS-HARRIS SCALE, THE ASSERTIVENESS INVENTORY AND THE EDI

The Piers-Harris Scale

Table 1 presents the mean scores of the population surveyed on the six cluster scales of the P-H Scale. Since no previously established norms were available for this

Table 1 - Piers-Harris raw scale mean scores and standard deviations of 12 to 14 year old female students (N=159).

<u>Scales</u>	<u>Mean</u>	<u>S.D.</u>	<u>Max</u>	<u>Min</u>
Behavior	14.09	1.70	16	0
Intellectual and School Status	14.27	1.65	17	0
Physical Appearance and Attributes	10.67	1.61	13	0
Anxiety	11.26	1.75	14	0
Popularity	10.25	1.24	12	0
Happiness and Satisfaction	8.77	1.18	10	0

specific age and grade group, no comparisons were possible between the population surveyed in this study and a similar normative sample. However, it was possible to compare the present population's mean scale scores with the scores of elementary, junior high and senior high school female students (Table 2). The scores of the present population were higher on all scales. Thus, it is possible to assume that the present population group had a higher perceived self-concept. However, caution should be taken in interpreting the results of this comparison since the second population group had a much wider age and grade range.

The Assertiveness Inventory

Since the Assertiveness Inventory had not been used with children older than 12 before the present study, no normative mean scores for females 12 to 14 of age were available for comparison. Table 3 presents the mean scores of the surveyed population on the two cluster scales of the Assertiveness Inventory.

The Eating Disorder Inventory

No normative EDI mean scores for this specific age group were available for comparison or for determining whether the surveyed population represented a high or low risk popula-

Table 2 - Comparison between the Piers-Harris raw scale mean scores and standard deviations of the present population (1) and a previous one (2).

<u>Scales</u>	<u>Mean1 a</u>	<u>S.D.1 a</u>	<u>Mean2 b</u>	<u>S.D.2 b</u>
Behavior	14.09	1.70	12.00	2.92
Intellectual and School Status	14.27	1.65	11.55	3.45
Physical Appearance and Attributes	10.67	1.61	8.16	2.85
Anxiety	11.26	1.75	8.70	3.01
Popularity	10.25	1.24	8.33	2.52
Happiness and Satisfaction	8.77	1.18	8.07	1.83

a Based on a sample of 159 middle school female students.

b Based on a sample of 248 elementary, junior high and senior high school female students (Piers 1984, p 51).

Table 3 - Assertiveness Inventory raw scale mean scores and standard deviations of 12 to 14 year old female students (N=159).

<u>Scales</u>	<u>Mean</u>	<u>S.D.</u>
Positive Assertiveness	12.006a	1.4687
Negative Assertiveness	11.899a	1.4803

a Maximum=14, Minimum=7.

lation for the development of eating disorders. Consequently, no conclusions could be reached for this sample based on the mean scores alone. Table 4 presents the mean scores of the population surveyed for the EDI cluster scales using the original scoring method whereas Table 5 presents these figures using the modified scoring method.

CORRELATIONS AND RELATIONSHIPS BETWEEN THE EDI AND THE PIERS-HARRIS SCALE

Significant correlations were found for 21 scale comparisons between the EDI and the P-H Scale (Table 6). The P-H scale of Behavior correlated negatively with the following EDI scales: Bulimia (-0.2928), Ineffectiveness (-0.3304), Perfectionism (-0.2952), and Interpersonal Distrust (-0.3796). Based on these correlations, the following relationships can be described. The more a young girl experiences behavioral problems, the more likely she will be to experience bulimic episodes of binging and purging as well as feelings of inadequacy, insecurity and powerlessness in leading her life. She will also be more likely to expect too much of herself and to be unable to recognize her emotions or her sensations of hunger and satiety.

Table 4 - EDI raw scale mean scores and standard deviations of 12 to 14 year old female students using the original scoring method (N=159)

<u>Scales</u>	<u>Mean</u>	<u>S.D.</u>	<u>Max</u>	<u>Min</u>
Drive for Thinness	5.2516	5.3376	19	0
Bulimia	9.4151	8.376	27	0
Body Dissatisfaction	4.1258	3.1954	18	0
Ineffectiveness	2.1698	3.1287	14	0
Perfectionism	3.4654	3.1777	15	0
Interpersonal Distrust	4.2201	4.3807	22	0
Introceptive Awareness	4.0063	4.8246	24	0
Maturity Fears	5.5660	4.0337	18	0

Table 5 - EDI raw scale mean scores and standard deviations of 12 to 14 year old female students using the modified scoring method (N=159).

<u>Scales</u>	<u>Mean</u>	<u>S.D.</u>	<u>Max</u>	<u>Min</u>
Drive for Thinness	21.522	8.1510	40	7
Bulimia	31.830	12.3590	54	9
Body Dissatisfaction	23.604	4.8630	42	10
Ineffectiveness	16.145	5.7864	35	7
Perfectionism	20.270	5.4226	34	7
Interpersonal Distrust	28.025	7.5311	52	13
Introceptive Awareness	27.497	8.6256	54	10
Maturity Fears	21.044	5.4937	36	8

Table 6 - Correlations between the EDI and the P-H scales at $p=0.0001$

<u>P-H scales</u>	<u>EDI scales</u>							
	Drive for Thinness	Bulimia	Body Dissa- tisfaction	Ineffec- tiveness	Perfec- tionism	Interperso- nal Distrust	Introceptive Awareness	Maturity Fears
Behavior	-	-0.2928a	-	-0.3304	-0.2952a	-0.3796	-	-
Intellectual and School Status	-	-	-	-	-0.3811	-	-0.4055	-
Physical Appearance and Attributes	-	-0.4096	-	-	-0.3631	-	-	-
Anxiety	-	-	-0.3601	-	-0.4207	-0.4034	-0.5566	-
Popularity	-	-	-	-	-0.3721	-	-0.3735	-
Happiness and Satisfaction	-0.3016	-0.4869	-	-0.3941	-0.3907	-0.3383	-0.6646	-

a $p=0.0002$

The P-H scale of Intellectual and School Status correlated negatively with two EDI scales: Perfectionism (-0.3811) and Introceptive Awareness (-0.4055). These correlations correspond to the following relationships. The less a young girl is satisfied with her intellectual abilities and academic achievements, the more likely she will be to expect too much of herself and to experience confusion in identifying her emotions or her sensations of hunger and satiety.

The P-H scale of Physical Appearance and Attributes correlated negatively with the following EDI scales: Bulimia (-0.4096), Perfectionism (-0.3631) and Introceptive Awareness (-0.4894). Based on these correlations, the following relationships can be described. The less a young girl is satisfied with her physical appearance and her ability to be a leader and to express ideas, the more likely she will be to experience bulimic episodes of binging and purging, to set excessively high expectations for herself and to be unable to recognize her emotions or her sensations of hunger and satiety.

The P-H scale of Anxiety correlated negatively with four EDI scales: Body Dissatisfaction (-0.3601), Perfectionism (-0.4207), Interpersonal Distrust (-0.4034) and Introceptive Awareness (-0.5566). These correlations reflect the following relationships. The more a young girl experiences

emotional disturbances and dysphoric moods, such as worry, sadness and isolation, the more likely she will be to believe that certain parts of her body that go through changes at puberty are too large. She will also be more likely to expect too much of herself, to experience alienation and difficulty in forming close relationships and, to be confused when trying to identify her emotions and her sensations of hunger and satiety.

The P-H scale of Popularity correlated negatively with two EDI scales: Perfectionism (-0.3721) and Introceptive Awareness (-0.3735). These correlations can be translated into the following relationships. The lower a young girl's evaluation of her own popularity with peers and her ability to make friends, the more likely she will be to set excessively high expectations for herself and to be unable to recognize and identify her emotions as well as her body sensations that relate to appetite.

Finally, the P-H scale of Happiness and Satisfaction correlated negatively with six EDI scales: Drive for Thinness (-0.3016), Bulimia (-0.4869), Ineffectiveness (-0.3941), Perfectionism (-0.3907), Interpersonal Distrust (-0.3383), and Introceptive Awareness (-0.6646). Based on these correlations, the following relationships can be described. The less a young girl generally feels happy, easy to get along

with and satisfied with life, the more likely she will be to be excessively concerned about her weight, her need to diet and her desire to be thin. She will also be more likely to experience bulimic episodes of bingeing and purging, feelings of inadequacy, insecurity and powerlessness in leading her life, excessive personal expectations, feelings of alienation and difficulty in forming close relationships and difficulty in recognizing and identifying her emotions and her sensations of hunger and satiety.

Based on the above relationships between the P-H Scale and the EDI, a certain self-concept profile emerges for the girls who scored high on the EDI in the population surveyed. These girls appear more likely to be experiencing certain behavioral problems, little satisfaction with their intellectual and academic achievements, and a devaluated body image as reflected by dissatisfaction with their physical appearance. Those girls who scored high on the EDI appear also more likely to be dissatisfied with their abilities to lead or express ideas. Furthermore, they would be more likely to experience emotional disturbances and dysphoric moods, to feel unpopular and unable to make friends and, in general, would not be feeling happy, easy to get along with or satisfied with life. Therefore, it appears that, a low self-concept in the six areas assessed by the P-H Scale is associated with a higher EDI score or a higher potential for

developing an eating problem that could lead to an eating disorder as assessed by the EDI.

The trends described above can be compared to the results of a study by Casper et al. (1981) where acutely ill anorexic female patients were characterized by distressing effects, poor self-concepts and insecurity in social relationships as compared to a normal sample. Weinreich et al. (1985) also found that anorexic and bulimic females had devaluated self-concepts and self-images. When Swift et al. (1986) investigated the psychological self-image of adolescent anorexics, they found these subjects to have a very poor adjustment in the areas of emotional tone, body image and self-image. Therefore, previous studies support the findings of the present study in relationship to self-concept, body image and eating disorders. However, the present research effort brings a new insight in this field since the group surveyed was a normal population and not an anorexic or bulimic sample. The fact that, among such a normal group, an inverse relationship was found between self-concept and body image on the one hand and tendency toward eating disorders on the other, suggests that a low self-concept and a poor body image could be two of the predisposing factors toward the development of anorexia or bulimia.

CORRELATIONS AND RELATIONSHIPS BETWEEN THE EDI AND THE
ASSERTIVENESS INVENTORY

The Positive Assertiveness scale was the only scale of the Assertiveness Inventory that correlated significantly with the EDI. The Positive Assertiveness scale correlated negatively with the EDI scales of Perfectionism (-0.4006 , $p=0.0001$) and Introceptive Awareness (-0.3512 , $p=0.0001$). These correlations can be translated into the following relationships. The lower a young girl's assertiveness in positive situations such as receiving compliments, the more likely she will be to expect too much of herself and to be unable to recognize or identify her emotions or her sensations of hunger and satiety.

The above relationships suggest that a lack of positive assertiveness in a young girl could be associated with perfectionism and poor introceptive awareness which are both present in anorexia and bulimia. Dwyer (1985, p 20) has suggested that refusal of food and therapy provided the eating disorder patient with an opportunity to assert herself. However, the fact that only two EDI scales correlated negatively with one of the assertiveness scales does not provide enough evidence to suggest that lack of assertive skills could be a predisposing factor toward the

development of an eating problem that could lead to an eating disorder

THE NUTRITION QUESTIONNAIRE

Since the Nutrition Questionnaire (NQ) was developed by the researchers to meet the objectives of the present study, and since it had never been used before, it was important to consider its scales' reliability as well as its test-retest reliability over time.

The Eating When Dieting scale of the NQ had a coefficient alpha or reliability coefficient of 0.5488 and the Dieting Behavior scale had a coefficient alpha of 0.5280. These alpha coefficients indicate a high enough scale reliability to permit the use of these scales with large population groups for research purposes.

The intercorrelation between the Eating When Dieting scale and the Dieting Behavior scale was -0.21. This negligible correlation coefficient indicates that the two scales were reflecting two different dieting dimensions and were not duplicates of each other.

The test-retest reliability coefficient was 0.5988 ($p=0.0001$) for the Eating When Dieting scale and 0.3935 ($p=0.03$) for the Dieting Behavior scale. These coefficients indicate a moderate test-retest reliability over time. On the whole, 80% of the participants were less than one position off in their answers during retest on less than half of the questions, the other half of the questions having identical answers on the two tests.

Descriptive results and their meanings

Apart from its relationship to the other instruments that were administered, the NQ provided descriptive information about the population surveyed. The descriptive information related to dieting frequency among participants, their families and friends is presented in Table 7. The percent responses by question for all questions are presented along with the NQ in Appendix D.

One of the most striking descriptive findings is that 61% of the participants reported that their mothers were now trying to lose weight. Therefore, for all these girls, a dieting effort was present in the house and acknowledged. Whether their mothers' dieting was affecting the participants' own decision to diet or not remains unclear since only a negligible correlation (+0.2618) was found between the questions

Table 7 - Dieting frequency among participants, their families and friends (N=159).

	<u>Yes</u>	<u>No</u>	<u>N/Aa</u>
Do you think that your mother is now trying to lose weight?	61%	39%	-
Do you think that your father is now trying to lose weight?	28%	68%	4%
Do you think that any of your brothers or sisters are now trying to lose weight?	28%	67%	5%
Are you trying to lose weight now?	40%	60%	-
Are any of your close friends trying to lose weight now?	61%	37%	2%

a N/A = non-applicable

"Do you think that your mother is now trying to lose weight" and "Are you now trying to lose weight".

Another important descriptive finding is that 40% of the respondents said that they were trying to lose weight and 61% said that some of their close friends were also trying to lose weight. In other words, an important percentage of these girls and their peers did not feel satisfied with their body dimensions and were trying to change them. According to McCandless (1970), adolescence is a time when the body is considered the primary focus of concern. Grant and Fodor (1986) have also suggested that during adolescence, self-esteem is largely determined by body image and to a larger extent in females than in males because females tend to be more dissatisfied with their bodies than males. The above descriptive findings suggest that concern and/or dissatisfaction with body image were present in the population surveyed.

Correlations and relationships between the NQ and the EDI

Neither the Eating When Dieting nor the Dieting Behavior scales of the NQ correlated significantly with any of the EDI scales. The reason for this lack of correlations could lie in the fact that the EDI's objective is to assess certain psychological and behavioral traits common to eating

disorders' patients, whereas the NQ scales deal with actual eating habits and practices upon dieting. Therefore, it is possible that the NQ scales and the EDI did not intercorrelate because they were essentially measuring a set of different characteristics. It is also possible that these scales did not intercorrelate because the eating habits and practices of a young girl when she is dieting are not related to tendencies toward eating disorders.

Even though the Eating When Dieting and the Dieting Behavior scales of the NQ did not intercorrelate with the EDI, individual questions from the NQ did correlate significantly with some of the EDI scales (Table 8). For all the questions presented below, a "Yes" answer was reflected by a score of 1 and a "No" answer by a score of 2. Therefore, if a question correlated negatively with an EDI scale, this correlation meant that, if the girl scored high on the question by answering "No", she would be likely to score low on that EDI scale. The reverse would also be true where, if the girl scored low on the question by answering "Yes", she would be likely to score high on that EDI scale. The 1 and 2 scores do not reflect a value judgment as to whether "Yes" or "No" were the right answers. They were just allocated to these answers so that the statistical analysis could be done.

Table 8 - Correlations between individual NQ questions and the EDI scales

<u>NQ questions</u>	<u>EDI scales</u>							
	Drive for Thinness	Bulimia	Body Dissa- tisfaction	Ineffec- tiveness	Perfec- tionism	Interperso- nal Distrust	Introcepti- ve Awareness	Maturity Fears
Question 35	-0.6602 p=0.0001	-0.5457 p=0.0001	-	-0.2986 p=0.0001	-	-	-	-
Question 37	-0.6387 p=0.0001	-0.5242 p=0.0001	-	-0.2950 p=0.0002	-	-0.3609 p=0.0001	-	-
Question 38	-0.6120 p=0.0001	-0.5988 p=0.0001	-	-	-	-	-	-
Question 49			-0.3441 p=0.0066	-	-	-0.3186 p=0.0123	-	-
Question 81	-0.3854 p=0.0001	-	-	-	-	-	-	-
Question 82	-0.3919 p=0.0011	-0.3368 p=0.0057	-	-	-	-	-	-0.4489 p=0.0002
Question 83		-0.3647 p=0.0082	-	-0.3125 p=0.0106	-	-	-	-0.3227 p=0.0082

Question 35 of the NQ "Are you trying to lose weight now" correlated negatively with three EDI scales: Drive for Thinness (-0.6602), Bulimia (-0.5457) and Ineffectiveness (-0.2986). Based on these correlations, the following relationships can be described. If a young girl is trying to lose weight, she will be more likely to be excessively concerned about her weight, her need to diet and her desire to be thin. She will also be more likely to experience bulimic episodes of bingeing and purging as well as feelings of inadequacy, and powerlessness in leading her life.

Question 37 of the NQ "Are you usually worried about gaining weight" correlated negatively with four EDI scales: Drive for Thinness (-0.6387), Bulimia (-0.5242), Ineffectiveness (-0.2950) and Interpersonal Distrust (-0.3609). These correlations reflect the following relationships. If a young girl is usually worried about gaining weight, she will be more likely to be extremely worried about her weight, her need to diet and her desire to be thin. She will also be more likely to experience bulimic episodes of bingeing and purging, feelings of incompleteness, uncertainty and powerlessness in leading her life as well as feelings of alienation and difficulty in forming close relationships.

Question 38 of the NQ "Are you very interested in dieting" correlated negatively with two EDI scales: Drive for

Thinness (-0.6120) and Bulimia (-0.5988). These correlations are translated into the following relationships. If a young girl is very interested in dieting, she will be more likely to be excessive in evaluating her weight, her need to diet and her desire to be thin. She will also be more likely to go through bulimic episodes of bingeing and purging.

Question 49 of the NQ "When on a diet, do you act tense and irritable" correlated negatively with two EDI scales: Body Dissatisfaction (-0.3441) and Interpersonal Distrust (-0.3186). These correlations reflect the following relationships. If a young girl acts tense and irritable while dieting, she will be more likely to believe that certain parts of her body that go through changes at puberty are too large and to experience feelings of estrangement and awkwardness in forming close relationships.

Question 81 of the NQ "Do you read about diets in magazines and newspapers" correlated negatively with the EDI scale of Drive for Thinness (-0.3854). In other words, if a young girl reads about diets in magazines, she will be more likely to be excessively concerned about her weight, her need to diet and her desire to be thin.

Question 82 of the NQ "Do you follow diets in magazines and newspapers" correlated negatively with three EDI scales:

Drive for Thinness (-0.3919), Bulimia (-0.3368) and Maturity Fears (-0.4488). Based on these correlations, the following relationships can be described. If a young girl follows diets in magazines, she will be more likely to have an extreme attitude when considering her weight, her need to diet and her desire to be thin. She will also be more likely to experience bulimic episodes of bingeing and purging and to wish she could go back to pre-teenage years to escape the demands of adulthood.

Finally, question 83 of the NQ "Do you ask friends for ideas about dieting" correlated negatively with the EDI scales of Bulimia (-0.3647), Ineffectiveness (-0.3125) and Maturity Fears (-0.3227). These correlations reflect the following relationships. If a young girl asks her friends for ideas about dieting, she will be more likely to experience bulimic episodes of bingeing and purging as well as feelings of inadequacy, worthlessness and powerlessness in leading her life. She will also be more likely to wish she could retreat to pre-teenage years so as to escape the demands of adulthood.

Based on the above correlations and relationships, another trend emerges among the girls that scored high on the EDI in the population surveyed. These girls appear to be the ones that said that they were trying to lose weight, usually

worried about gaining weight and very interested in dieting. They were also the ones who said that they acted tense and irritable when dieting, that they read about diets in magazines, followed these diets and asked their friends about dieting techniques. Therefore, it appears that active involvement or interest in dieting among the girls in this population was associated with higher EDI scores or a higher potential for an eating problem that could lead to an eating disorder as assessed by the EDI.

Dwyer (1985, p 20) has already suggested that the thoughts, attitudes and behaviors associated with dieting may increase the risk of developing an eating disorder. The results of the present study support this claim. Therefore, it can be hypothesized at this point that heavy involvement or interest in dieting can be among the predisposing factors toward the development of an eating disorder.

Since the respondents were asked to report their heights and weights on the NQ, it was possible to compute an Obesity Index for each girl that provided the information. The Obesity Index was obtained by dividing the height of each girl by her weight. The resulting figure could be used for relative comparisons between subjects. It was assumed that, even if the height and weight values reported by the respondents were not very accurate, they would be close to the

actual values. The Obesity Index was found to correlate positively with two EDI scales: Drive for Thinness (+0.4146, $p=0.0001$) and Bulimia (=0.5089, $p=0.0001$). These correlations reflect the following relationships. The closer the young girl is to obesity, the more likely she will be excessively concerned about her weight, her need to diet and her desire to be thin. She will also be more likely to experience bulimic episodes of bingeing and purging. Similar correlations were also found between the girl's weight and the EDI scales of Drive for Thinness and Bulimia.

According to Herzog and Copeland (1985), anorexia nervosa very often begins in a young adolescent who is overweight. Then the originally moderate effort to lose weight turns into an obsession with thinness and a severe food restriction that both finally lead to an eating disorder. The results of the present study tend to support this view. Therefore, it can be suggested that obesity and weight problems can both be among the predisposing factors for the development of an eating disorder because they often trigger the original dieting effort that later gets out of hand.

When examining the relationship between the family's involvement in dieting and the young girl's EDI scores, the following results emerged. No significant correlations were

found between the parents' involvement in dieting and the girl's EDI scores. However, question 27 of the NQ "Are any of your brothers or sisters trying to lose weight now" correlated negatively with three EDI scales: Drive for Thinness (-0.3864, $p=0.0001$), Bulimia (-0.2903, $p=0.0003$) and Ineffectiveness (-0.3434, $p=0.0001$). According to these correlations, if a young girl's siblings are trying to lose weight, then she will be more likely to be excessively concerned about her weight, her need to diet and her desire to be thin. She will also be more likely to experience episodes of binging and purging as well as feelings of inadequacy, worthlessness and powerlessness in leading her life. Question 29 of the NQ "Are any of your brothers and/or sisters usually worrying about gaining weight" also correlated negatively with the EDI scale of Drive for Thinness (-0.309, $p=0.0001$). In other words, if a young girl's siblings are usually worried about gaining weight, she will be more likely to be excessively concerned with her weight, her need to diet and her desire to be thin.

The above relationships indicate that the girls who scored high on certain EDI scales were more likely to have siblings that were concerned with or involved in dieting. Could it be that the siblings' attitude toward weight and dieting are influencing the young girl's attitudes toward weight and dieting? The possibility should be considered.

Finally, interesting correlations were found between two sets of NQ questions. Question 42 "When on a diet, does any member of your family stop eating certain kinds of foods" correlated positively with question 48 "When on a diet, do you stop eating certain kinds of foods" (+0.59947, $p=0.0001$). Also, question 43 "When on a diet, does any member of your family act tense and irritable" correlated positively with question 49 "When on a diet, do you act tense and irritable" (+0.6395, $p=0.0001$). These correlations suggest that young teenage girls will tend to have a similar dieting behavior to the one adopted by other family members when they diet. This could be a positive influence if the family members that are dieting use sound dieting practices that their daughter or sister would benefit from learning. This could also be a negative influence if the family members are following fad or crash diets. These results suggest that parents and siblings should be made more conscious about the example they provide to their younger daughters or sisters when they go on diets and thus try to make the best of the influence their behavior has on their daughters' or sisters' behavior.

No significant relationships were found between the NQ questions related to the eating of specific foods and meals and any of the EDI scales

No significant correlations were found between the respondents' birth order or the sex of their siblings on the one hand and their EDI scores or their answers on the desire to diet questions of the NQ on the other. These correlations ranged from -0.1653 to +0.1308.

No significant correlations were found between the NQ and the Piers-Harris Scale or the Assertiveness Inventory.

RESULTS BY HYPOTHESES

Self-concept, body image and eating disorders

In the present study, a young girl's evaluation of her self-concept and physical self-image (P-H Scale) was always inversely related to the presence of psychological and behavioral traits common to eating disorders (EDI). Therefore, the results of this study support the hypothesis that a poor self-concept and a poor body image can both be predisposing factors for the development of an eating problem that could lead to an eating disorder in a young female adolescent.

Assertiveness skills and eating disorders

Since the inverse relationship between assertiveness skills (Assertiveness Inventory) and psychological and behavioral traits common to eating disorders (EDI) was limited to two significant correlations, the results of this analysis remain inconclusive and present only a very limited support to the hypothesis that poor assertive skills could favor the occurrence of an eating problem that could lead to an eating disorder.

Sex of siblings, birth order and eating disorders

Since there were no significant relationships between the sex of siblings or the respondents' birth order and psychological and behavioral traits common to eating disorders (EDI), the results of this study do not support the hypothesis that sex of siblings or birth order could play a role in the development of an eating problem that could lead to an eating disorder.

Familial dieting and eating disorders

No relationships were found between the parents' dieting and the girl's dieting or her EDI scores. However, significant relationships were found between what family members did

when dieting and what the girl herself did when dieting. A significant relationship was also found between the siblings' dieting and the young girl's score on two EDI scales: Drive for Thinness and Bulimia. Therefore, the results of the present study provide a limited support to the hypothesis that familial dieting and dieting behavior can play a role in the development of an eating problem that could lead to an eating disorder in a young female adolescent.

Personal dieting practices and eating disorders

Since no significant relationships were found between dieting practices or dieting behavior (NQ) and psychological and behavioral traits common to eating disorders (EDI), the results of this study do not support the hypothesis that poor dieting practices or behavior can be predisposing factors towards the development of an eating disorder. However, significant relationships were found between the young girl's interest or involvement in dieting and the potential for the development of an eating disorder. Therefore, the results of this study suggest that involvement and/or interest in dieting as well as fear of weight gain can all be predisposing factors toward the development of an eating problem that could lead to an eating disorder in a young teenage girl. Obesity and overweight also appeared to

be possible risk factors.

LIMITATIONS

Due to the exploratory nature of this study, and due to the design used, several limitations must be addressed.

Since the survey was limited to one junior high school in one school division, the sample population was a very specific one. This specificity will affect the level of generalization that can be reached when the implications of this research will be stated. However, the school surveyed was identified as representative of the rest of the school population throughout the district by the supervisor of health of the local school division. Therefore, when the implications are reached, they may be applicable to a broader population group than the one surveyed.

The use of self-report instruments inherently imposes certain limitations. Respondents can choose not to be very honest by selecting what seems to be the most positive answer rather than the one that describes them best. It is also possible that some of the respondents misinterpret certain questions and thus pick the wrong answers. It is usually desirable to supplement the use of self-report instruments by other assessment methods such as direct interviews. However, the researchers did not have the

facilities or the manpower to conduct such interviews and had to limit themselves to the use of self-report questionnaires. Other instruments could have also been used and more data obtained on issues related to eating disorders. However, this was not done in order to avoid confusing the young participants with too many questionnaires. The time during which the students were to be accessible to the researchers was a major consideration in selecting the instruments used.

The Nutrition Questionnaire included a few questions that were either too broad or too specific and might have lead to some confusion among the respondents. This questionnaire will have to be revised and improved before it is used again. Furthermore, only 6% of the correlation coefficients that were calculated between NQ questions and the EDI appeared to be significant. This limited number of significant correlations suggests that the NQ questions will have to be modified if they are to correlate better with the EDI in future research.

The physical arrangements during the survey were not optimal and may have affected the results. Some of the classes surveyed were rather crowded and the students had to sit close to each other when answering the questionnaires. This physical closeness facilitated interaction and some of the

students commented among themselves about the questions that they were reading. The researchers tried to limit these interactions as much as possible but could not eliminate them totally. However, since these interactions were limited to few students in only some of the classes, it is unlikely that their effect on the survey's result was a major one.

Finally, another limitation of this study resides in the lack of specific norms for the standardized tests that were used in order to allow the comparison of the population surveyed to other similar groups across the nation. Therefore, it was impossible to determine whether the population surveyed was at high risk for the development of eating disorders, had a high or low self-concept or had good assertive skills. However, it is hoped that the mean scores of the participants on the standardized instruments used in the present survey can be used for comparison in later studies with a similar group.

IMPLICATIONS AND CONCLUSIONS

Several implications can be drawn from the results of the present study and future research needs can also be suggested.

The objective of this study was to investigate the existence of certain factors that could increase a young girl's susceptibility for developing an eating disorder. The identification of these factors was considered as essential if prevention and/or early detection of eating disorders were to be achieved with greater success in the future. Four major factors emerged in this study as significantly associated with tendency toward eating disorders: low self-concept, poor body image, active involvement or interest in dieting to lose weight and obesity or overweight. The family's involvement in dieting also appeared to be related to tendency toward eating disorders but to a lesser extent.

The predisposing factors described above should be at the core of preventive education for eating disorders. Such education will mostly have to be done by physical education teachers, school counselors, and health professionals within the school system. These educators will have the challenging task of helping their students learn to think of and

see themselves more positively so that they would not have to turn to food and weight loss as a way out of their self-hate. The educators will also have to warn the youngsters about the dangers of crash and fad diets and direct them toward healthy and safe methods for losing weight, but only if the youngsters are actually overweight. Addressing these issues clearly and repeatedly could help the young students become more aware of their problems and how to deal with them or could direct the students toward seeking professional help before an eating disorder develops.

Knowledge of the factors associated with tendency toward eating disorders should facilitate early detection of these disorders. If a young girl is losing weight at an alarming rate and to the point of developing amenorrhea, her family, her teachers and her physician should look for other signs that could speed up the diagnosis of an eating disorder, if any. The same would apply to a girl who is binging regularly but is not purging yet. If these symptoms are found to be accompanied by a low self-concept, a poor body image or a history of dieting and weight problems, the appropriate treatment should be started before active development of anorexia or bulimia. The family's involvement in dieting should also be considered. Early detection and intervention being crucial for improving the prognosis of eating disorders (Weeda-Mannak et al. 1983), knowing what to look for in

a young girl presenting with some of the symptoms is of major importance.

Future research is still very much needed in the area of eating disorders. Developing an adequate educational and preventive program for eating disorders is more important than ever because of the increased occurrence of these disorders (Szmukler, 1985) and the younger age at which they are starting (Fosson et al. 1987). Parents should be made more aware of anorexia and bulimia and what signs to look for in their children so as to detect the disorders as soon as possible. Special educational programs about eating disorders should be designed for the parents. Through an appropriate parent-school effort, the development of eating disorders in young adolescent girls could hopefully be decreased or at least, prevented from increasing.

There is also a need for further research efforts to investigate more in depth some of the findings of the present study. The relationships between involvement in dieting and tendency toward eating disorders needs to be clarified and the consequences of following crash diets further examined. The effects of familial involvement in dieting also need to be probed in more detail. Since the existence of a link between lack of assertive skills and eating disorders was not ruled out, it should also be researched again, possibly

from a different perspective. Finally, the present study design needs to be replicated in order to confirm its results or challenge them.

Due to the complexity of eating disorders and the suffering they cause in many lives, researching them further and further remains a must. Every time some of their secrets are uncovered, a small victory is achieved on behalf of the millions of people struggling with these disorders. It is hoped that the present study, by providing additional insight into this field, will help in carrying the victory a little further.

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APPENDIX A

"THE WAY I FEEL ABOUT MYSELF"**The Piers-Harris Children's Self-Concept Scale**

Ellen V. Piers, Ph.D. and Dale B. Harris, Ph.D.

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Name: _____ Today's Date: _____
 Age: _____ Sex (circle one): Girl Boy Grade: _____
 School: _____ Teacher's Name (optional): _____

Directions: Here are a set of statements that tell how some people feel about themselves. Read each statement and decide whether or not it describes the way you feel about yourself. If it is *true or mostly true* for you, circle the word "yes" next to the statement. If it is *false or mostly false* for you, circle the word "no." Answer every question, even if some are hard to decide. Do not circle both "yes" and "no" for the same statement.

Remember that there are no right or wrong answers. Only you can tell us how you feel about yourself, so we hope you will mark the way you really feel inside.

TOTAL SCORE: Raw Score _____ Percentile _____ Stanine _____

CLUSTERS: I _____ II _____ III _____ IV _____ V _____ VI _____

- | | | | |
|---|----|---|----|
| 1. My classmates make fun of meyes | no | 21. I am good in my school workyes | no |
| 2. I am a happy personyes | no | 22. I do many bad thingsyes | no |
| 3. It is hard for me to make friendsyes | no | 23. I can draw wellyes | no |
| 4. I am often sadyes | no | 24. I am good in musicyes | no |
| 5. I am smartyes | no | 25. I behave badly at homeyes | no |
| 6. I am shyyes | no | 26. I am slow in finishing my school workyes | no |
| 7. I get nervous when the teacher calls on meyes | no | 27. I am an important member of my classyes | no |
| 8. My looks bother meyes | no | 28. I am nervousyes | no |
| 9. When I grow up, I will be an important personyes | no | 29. I have pretty eyesyes | no |
| 10. I get worried when we have tests in schoolyes | no | 30. I can give a good report in front of the classyes | no |
| 11. I am unpopularyes | no | 31. In school I am a dreameryes | no |
| 12. I am well behaved in schoolyes | no | 32. I pick on my brother(s) and sister(s)yes | no |
| 13. It is usually my fault when something goes wrongyes | no | 33. My friends like my ideasyes | no |
| 14. I cause trouble to my familyyes | no | 34. I often get into troubleyes | no |
| 15. I am strongyes | no | 35. I am obedient at homeyes | no |
| 16. I have good ideasyes | no | 36. I am luckyyes | no |
| 17. I am an important member of my familyyes | no | 37. I worry a lotyes | no |
| 18. I usually want my own wayyes | no | 38. My parents expect too much of meyes | no |
| 19. I am good at making things with my handsyes | no | 39. I like being the way I amyes | no |
| 20. I give up easilyyes | no | 40. I feel left out of thingsyes | no |

- | | | | | | |
|---|-----|----|--|-----|----|
| 41. I have nice hair | yes | no | 61. When I try to make something, everything seems to go wrong | yes | no |
| 42. I often volunteer in school | yes | no | 62. I am picked on at home | yes | no |
| 43. I wish I were different | yes | no | 63. I am a leader in games and sports | yes | no |
| 44. I sleep well at night | yes | no | 64. I am clumsy | yes | no |
| 45. I hate school | yes | no | 65. In games and sports, I watch instead of play | yes | no |
| 46. I am among the last to be chosen for games | yes | no | 66. I forget what I learn | yes | no |
| 47. I am sick a lot | yes | no | 67. I am easy to get along with | yes | no |
| 48. I am often mean to other people | yes | no | 68. I lose my temper easily | yes | no |
| 49. My classmates in school think I have good ideas | yes | no | 69. I am popular with girls | yes | no |
| 50. I am unhappy | yes | no | 70. I am a good reader | yes | no |
| 51. I have many friends | yes | no | 71. I would rather work alone than with a group | yes | no |
| 52. I am cheerful | yes | no | 72. I like my brother (sister) | yes | no |
| 53. I am dumb about most things | yes | no | 73. I have a good figure | yes | no |
| 54. I am good-looking | yes | no | 74. I am often afraid | yes | no |
| 55. I have lots of pep | yes | no | 75. I am always dropping or breaking things | yes | no |
| 56. I get into a lot of fights | yes | no | 76. I can be trusted | yes | no |
| 57. I am popular with boys | yes | no | 77. I am different from other people | yes | no |
| 58. People pick on me | yes | no | 78. I think bad thoughts | yes | no |
| 59. My family is disappointed in me | yes | no | 79. I cry easily | yes | no |
| 60. I have a pleasant face | yes | no | 80. I am a good person | yes | no |

APPENDIX B

The Children's Assertiveness Inventory

Please answer these questions with a YES or a NO. Yes is 1 and No is 2.

1. When you meet someone your age, do you start talking with them?
2. When someone your age tells you that you look nice, do you disagree with them?
3. When someone your age tells that you are doing a good job, do you agree?
4. When someone your age tells you they want to play a game but you don't feel like it, do you play with them?
5. When you get angry with someone your age, do you let them know?
6. When someone your age asks to borrow something special and you would prefer they not use it, do you let them?
7. When you like someone your age, do you tell them?
8. When someone your age cuts in front of you in line, do you tell them to go to the end?
9. When someone your age does a good job with something, do you congratulate them?
10. When someone your age takes something that is yours, do you let them take it?
11. When someone your age asks you to do a lot of things and you are getting tired of doing them, do you continue to do them?
12. When someone your age treats you unfairly, do you remain quiet about it?
13. When you do something good, do you tell someone your age about it?
14. When you do something wrong to someone your age and are at fault, do you apologize to them?

APPENDIX C

EDI

David M. Garner, Ph. D.
 Marion P. Olmsted, M.A.
 Janet Polivy, Ph. D.

Name _____ Date _____

Age _____ Sex _____ Marital status _____

Present weight _____ Height _____

Highest past weight (excluding pregnancy) _____ (lbs)

How long ago? _____ (months)

How long did you weigh this weight? _____ (months)

Lowest past adult weight _____ (lbs)

How long ago? _____ (months)

How long did you weigh this weight? _____ (months)

What do you consider your ideal weight? _____ (lbs)

Age at which weight problems began (if any) _____

Present occupation _____

Father's occupation _____ Mother's occupation _____

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INSTRUCTIONS

This is a scale which measures a variety of attitudes, feelings and behaviors. Some of the items relate to food and eating. Others ask you about your feelings about yourself. THERE ARE NO RIGHT OR WRONG ANSWERS SO TRY VERY HARD TO BE COMPLETELY HONEST IN YOUR ANSWERS. RESULTS ARE COMPLETELY CONFIDENTIAL. Read each question and fill in the circle under the column which applies best to you. Please answer each question very carefully. Thank you.

	ALWAYS	USUALLY	OFTEN	SOMETIMES	RARELY	NEVER
1. I eat sweets and carbohydrates without feeling nervous.	<input type="radio"/>					
2. I think that my stomach is too big.	<input type="radio"/>					
3. I wish that I could return to the security of childhood.	<input type="radio"/>					
4. I eat when I am upset.	<input type="radio"/>					
5. I stuff myself with food.	<input type="radio"/>					
6. I wish that I could be younger.	<input type="radio"/>					
7. I think about dieting.	<input type="radio"/>					
8. I get frightened when my feelings are too strong.	<input type="radio"/>					
9. I think that my thighs are too large.	<input type="radio"/>					
10. I feel ineffective as a person.	<input type="radio"/>					
11. I feel extremely guilty after overeating.	<input type="radio"/>					
12. I think that my stomach is just the right size.	<input type="radio"/>					
13. Only outstanding performance is good enough in my family.	<input type="radio"/>					
14. The happiest time in life is when you are a child.	<input type="radio"/>					
15. I am open about my feelings.	<input type="radio"/>					
16. I am terrified of gaining weight.	<input type="radio"/>					
17. I trust others.	<input type="radio"/>					
18. I feel alone in the world.	<input type="radio"/>					
19. I feel satisfied with the shape of my body.	<input type="radio"/>					
20. I feel generally in control of things in my life.	<input type="radio"/>					
21. I get confused about what emotion I am feeling.	<input type="radio"/>					
22. I would rather be an adult than a child.	<input type="radio"/>					
23. I can communicate with others easily.	<input type="radio"/>					
24. I wish I were someone else.	<input type="radio"/>					
25. I exaggerate or magnify the importance of weight.	<input type="radio"/>					
26. I can clearly identify what emotion I am feeling.	<input type="radio"/>					
27. I feel inadequate.	<input type="radio"/>					
28. I have gone on eating binges where I have felt that I could not stop.	<input type="radio"/>					
29. As a child, I tried very hard to avoid disappointing my parents and teachers.	<input type="radio"/>					
30. I have close relationships.	<input type="radio"/>					

	ALWAYS	USUALLY	OFTEN	SOMETIMES	RARELY	NEVER
31. I like the shape of my buttocks.	<input type="radio"/>					
32. I am preoccupied with the desire to be thinner.	<input type="radio"/>					
33. I don't know what's going on inside me.	<input type="radio"/>					
34. I have trouble expressing my emotions to others.	<input type="radio"/>					
35. The demands of adulthood are too great.	<input type="radio"/>					
36. I hate being less than best at things.	<input type="radio"/>					
37. I feel secure about myself.	<input type="radio"/>					
38. I think about bingeing (over-eating).	<input type="radio"/>					
39. I feel happy that I am not a child anymore.	<input type="radio"/>					
40. I get confused as to whether or not I am hungry.	<input type="radio"/>					
41. I have a low opinion of myself.	<input type="radio"/>					
42. I feel that I can achieve my standards.	<input type="radio"/>					
43. My parents have expected excellence of me.	<input type="radio"/>					
44. I worry that my feelings will get out of control.	<input type="radio"/>					
45. I think that my hips are too big.	<input type="radio"/>					
46. I eat moderately in front of others and stuff myself when they're gone	<input type="radio"/>					
47. I feel bloated after eating a normal meal.	<input type="radio"/>					
48. I feel that people are happiest when they are children.	<input type="radio"/>					
49. If I gain a pound, I worry that I will keep gaining.	<input type="radio"/>					
50. I feel that I am a worthwhile person.	<input type="radio"/>					
51. When I am upset, I don't know if I am sad, frightened, or angry. .	<input type="radio"/>					
52. I feel that I must do things perfectly, or not do them at all.	<input type="radio"/>					
53. I have the thought of trying to vomit in order to lose weight.	<input type="radio"/>					
54. I need to keep people at a certain distance (feel uncomfortable if someone tries to get too close).	<input type="radio"/>					
55. I think that my thighs are just the right size.	<input type="radio"/>					
56. I feel empty inside (emotionally).	<input type="radio"/>					
57. I can talk about personal thoughts or feelings.	<input type="radio"/>					
58. The best years of your life are when you become an adult.	<input type="radio"/>					
59. I think that my buttocks are too large.	<input type="radio"/>					
60. I have feelings that I can't quite identify.	<input type="radio"/>					
61. I eat or drink in secrecy.	<input type="radio"/>					
62. I think that my hips are just the right size.	<input type="radio"/>					
63. I have extremely high goals.	<input type="radio"/>					
64. When I am upset, I worry that I will start eating.	<input type="radio"/>					

FOR OFFICE USE ONLY

DT	B	BD	I	P	ID	IA	MF

NUTRITION QUESTIONNAIRE

(Percent Responses by Question, N = 159)

_____ Age

_____ Height (inches)

_____ Weight (pounds)

_____ Grade

- 1) During the school year, do you live with: 1. both your parents (by birth or adoption); 2. mother and stepfather; 3. father and stepmother; 4. mother only; 5. father only; 6. other. 1 (7%) 4 (9%)
2 (12%) 5 (1%)
3 (3%) 6 (3%)
- 2) How many brothers do you have?
1. none (36%) 2. one (45%) 3. two (16%) 4. three (3%) 5. four or more (1%)
- 3) How many sisters do you have?
1. none (41%) 2. one (46%) 3. two (9%) 4. three (3%) 5. four or more (1%)
- 4) Are you
1. the youngest child? (43%) 2. the oldest child? (31%) 3. an only child? (6%) 4. other? (19%)
- 5) When eating at home, how long do you usually take to eat each meal?
1. less than 5 minutes (3%) 2. between 5 and 15 minutes (30%) 3. between 15 and 25 minutes (52%) 4. more than 25 minutes (14%)

When eating at home, do you

	usually	occasionally	rarely/never
6) eat with the whole family	1 (64%)	2 (22%)	3 (14%)
7) eat with some family members	1 (48%)	2 (45%)	3 (8%)
8) eat alone	1 (11%)	2 (38%)	3 (50%)
9) have your meals whenever you are hungry	1 (28%)	2 (43%)	3 (28%)
10) have your meals at specific times	1 (30%)	2 (32%)	3 (38%)
11) have your meals whenever you want to	1 (25%)	2 (36%)	3 (39%)
12) watch TV	1 (45%)	2 (37%)	3 (17%)
13) listen to music	1 (30%)	2 (38%)	3 (31%)
14) read or study	1 (16%)	2 (73%)	3 (60%)
15) talk with other family members	1 (53%)	2 (33%)	3 (13%)
16) talk on the phone	1 (25%)	2 (33%)	3 (40%)

- 17) When eating with your family, do you usually 1. feel relaxed and enjoy yourself? (72%) 2. feel tense? (6%) 3. neither enjoy nor dislike it? (18%) 4. do not eat with the family (4%) (MARK ONLY ONE CHOICE)

Do you think that your mother		
	yes	no
18) is now trying to lose weight	1 (61%)	2 (39%)
19) is very careful about what she eats	1 (62%)	2 (36%)
20) usually worries about gaining weight	1 (58%)	2 (42%)
21) is very interested in dieting	1 (45%)	2 (53%)
Do you think that your father		
22) is now trying to lose weight	1 (28%)	2 (68%)
23) is very careful about what he eats	1 (38%)	2 (58%)
24) usually worries about gaining weight	1 (23%)	2 (73%)
25) is very interested in dieting	1 (14%)	2 (81%)
Are any of your brothers or sisters		
26) I am an only child	1 (7%)	2 (92%)
27) trying to lose weight now	1 (28%)	2 (67%)
28) very careful about what they eat	1 (23%)	2 (72%)
29) usually worrying about gaining weight	1 (28%)	2 (67%)
30) very interested in dieting	1 (26%)	2 (70%)
Are any of your close friends		
31) trying to lose weight now	1 (61%)	2 (37%)
32) very careful about what they eat	1 (45%)	2 (52%)
33) usually worrying about gaining weight	1 (62%)	2 (36%)
34) very interested in dieting	1 (45%)	2 (53%)
Are you		
35) trying to lose weight now	1 (40%)	2 (60%)
36) very careful about what you eat	1 (44%)	2 (55%)
37) usually worrying about gaining weight	1 (56%)	2 (43%)
38) very interested in dieting	1 (32%)	2 (67%)

Skip to Question 45 if no one in your family has ever been on a diet.

When on a diet, does any member of your family

	yes	no	N/A
39) try to eat smaller helpings?	1 (63%)	2 (12%)	(25%)
40) almost stop eating for a few days?	1 (18%)	2 (57%)	(25%)
41) eat just one meal a day or skip certain meals?	1 (37%)	2 (38%)	(25%)
42) stop eating certain kinds of foods?	1 (64%)	2 (10%)	(26%)
43) act tense and irritable?	1 (26%)	2 (48%)	(26%)
44) increase physical activity?	1 (47%)	2 (26%)	(27%)

If you have never dieted, skip to Question 59.

If you are or ever have been on a diet, do you

45) try to eat smaller helpings?	1 (4%)	2 (35%)	(60%)
46) almost stop eating for a few days?	1 (18%)	2 (20%)	(62%)
47) eat just one meal a day or skip certain meals?	1 (23%)	2 (15%)	(62%)
48) stop eating certain kinds of foods?	1 (30%)	2 (8%)	(62%)
49) act tense and irritable?	1 (11%)	2 (27%)	(62%)
50) increase physical activity?	1 (35%)	2 (4%)	(62%)

If you are or ever have been on a diet, did your parents

	yes	no	N/A
51) approve and help you?	1 (25%)	2 (14%)	(61%)
52) disapprove and try to get you to eat more?	1 (9%)	2 (30%)	(62%)
53) neither approve, disapprove, nor interfere?	1 (16%)	2 (23%)	(61%)

If you are angry or upset, do you

	yes	no	N/A
54) eat more than usual?	1 (12%)	2 (26%)	(62%)
55) almost stop eating?	1 (18%)	2 (20%)	(62%)
56) stop eating with your family?	1 (10%)	2 (29%)	(61%)
57) not change anything in your eating habits?	1 (13%)	2 (26%)	(61%)

Do you do any of the following?

	never	once/week	3x/week	daily
58) eat three meals per day	1 (20%)	2 (17%)	3 (11%)	4 (42%)
59) take vitamin pills	1 (67%)	2 (10%)	3 (7%)	4 (15%)
60) skip breakfast	1 (30%)	2 (14%)	3 (23%)	4 (33%)
61) skip lunch	1 (9%)	2 (18%)	3 (29%)	4 (44%)
62) skip supper	1 (2%)	2 (9%)	3 (19%)	4 (70%)
63) snack between meals	1 (59%)	2 (19%)	3 (14%)	4 (7%)
64) snack while watching TV	1 (50%)	2 (21%)	3 (13%)	4 (15%)
65) snack while studying	1 (30%)	2 (14%)	3 (24%)	4 (33%)
66) exercise	1 (14%)	2 (27%)	3 (25%)	4 (34%)
67) trim all visible fat from meat before eating	1 (24%)	2 (18%)	3 (6%)	4 (51%)
68) keep track of calories eaten daily	1 (85%)	2 (8%)	3 (4%)	4 (3%)
69) drink skim milk	1 (75%)	2 (11%)	3 (4%)	4 (9%)
70) drink low fat milk	1 (33%)	2 (14%)	3 (11%)	4 (42%)
71) drink chocolate milk	1 (14%)	2 (12%)	3 (36%)	4 (38%)
72) drink whole milk	1 (28%)	2 (8%)	3 (19%)	4 (45%)
73) eat high-fiber, high-nutrient cold cereals	1 (36%)	2 (33%)	3 (13%)	4 (18%)
74) eat french fries	1 (26%)	2 (35%)	3 (32%)	4 (6%)
75) drink carbonated beverages	1 (6%)	2 (17%)	3 (24%)	4 (52%)
76) eat fried foods (chicken, fish, vegetables)	1 (37%)	2 (25%)	3 (30%)	4 (6%)
77) eat potato chips, corn chips, pretzels, etc.	1 (40%)	2 (21%)	3 (30%)	4 (9%)
78) eat fresh fruits	1 (9%)	2 (33%)	3 (31%)	4 (26%)
79) eat fresh vegetables	1 (15%)	2 (35%)	3 (26%)	4 (24%)
80) eat sweets (candy, pies, cakes, doughnuts)	1 (31%)	2 (28%)	3 (28%)	4 (12%)
81) read about diets in magazines or newspapers?	1. yes (49%) 2. no (46%)			

If you are or ever have been on a diet, what do (did) you do?

If you have never dieted, STOP HERE.

	yes	no	N/A
82) follow diets in magazines or newspapers?	1 (13%)	2 (29%)	(58%)
83) ask friends for ideas about dieting?	1 (15%)	2 (26%)	(58%)
84) count calories?	1 (17%)	2 (25%)	(58%)
85) skip breakfast?	1 (23%)	2 (18%)	(58%)
86) skip lunch?	1 (18%)	2 (23%)	(58%)
87) skip supper?	1 (11%)	2 (31%)	(58%)
88) eliminate bread and bread products?	1 (12%)	2 (30%)	(58%)
89) eliminate starches, such as potatoes, rice, and noodles?	1 (10%)	2 (26%)	(58%)
90) eliminate sweets?	1 (23%)	2 (19%)	(58%)
91) munch on raw vegetables?	1 (22%)	2 (19%)	(58%)
92) munch on fresh fruits?	1 (30%)	2 (11%)	(58%)
93) drink diet beverages?	1 (16%)	2 (26%)	(58%)
94) take appetite suppressant pills?	1 (4%)	2 (37%)	(58%)
95) drink supplement beverages or eat diet bars instead of meals?	1 (8%)	2 (33%)	(58%)
96) eliminate butter, margarine, and salad dressings?	1 (25%)	2 (17%)	(58%)
97) attend Weight Watchers?	1 (4%)	2 (38%)	(58%)

Thank you for your help!

VITA

Carine Mokbel was born January 26, 1965 in Beirut, Lebanon. In June 1985, she received a B.S. degree, with distinction, in Nutrition and Dietetics from the American University of Beirut. In September 1986, she came to Virginia Tech where she worked on a Masters' degree in Human Nutrition and Foods with an option in Community/Public Health Nutrition. After graduating, she will reside in Washington D.C. where she will work towards qualification as a Registered Dietitian. She later hopes to work in a hospital as a clinical dietitian.

A handwritten signature in cursive script that reads "Carine Mokbel". The signature is written in black ink and is positioned centrally below the typed text.