

Reasons for Exercising and Attitudes to Eating in Adolescent Girls

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by

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Reasons for Exercising and Attitudes to Eating in Adolescent Girls

Sophie Nesbitt

ABSTRACT

There is an increasing body of literature suggesting a link between exercise and the desire to attain or maintain a desirable body weight/shape. Much of this research has focused on how interest in physical activity could lead to the development and maintenance of an eating disorder. The aim of this study was to investigate further the relationship between exercise and attitudes to eating in adolescent girls.

The current research was a survey study that explored the association between motivation to exercise and attitudes to eating in a non clinical sample of adolescent girls aged between 14 and 16 years. The study also explored the association between mood and self-esteem in relation to exercise and eating.

Findings suggest that motivation to exercise for weight control reasons was associated with a higher score on the Eating Attitudes Test –26. Furthermore, weight control reasons for exercising were found to be a significant predictor variable for the total score on this measure. Other findings suggest an association between exercising for weight control reasons and low self-esteem and low mood.

Reasons for these associations and both theoretical and clinical implications are discussed and evaluated in view of design limitations. Recommendations for future research are proposed in light of the findings of this study and other relevant literature. Dissemination of these findings are reported and final conclusions made.

PERSONAL MOTIVATION FOR STUDY

My personal motivation for this study was generated by several things. I have always had a clinical interest in adolescents and young people. This interest was reflected in my choice of specialist placement which has involved working in a adolescent in-patient unit.

Working in a unit of this kind has involved working directly and indirectly with young people experiencing anorexia nervosa. As a result of this, I have seen at first hand the type of excessive exercise that is characteristic of the disorder. This has made me think about the function of exercise and the way this can impact on mental and physical health.

On a personal level, I have always used physical activity and exercise as an adaptive coping strategy at times of stress and difficulty. Therefore I was particularly interested in how exercise can become maladaptive and the impact this can have on the course of anorexia nervosa in young people.

1. INTRODUCTION

1.1 Overview of Chapter 1

There is an increasing body of literature suggesting a link between exercise and the desire to attain or maintain a desirable body weight/shape (Sands *et al.* 1997). Much of this research has focused on how interest in physical activity could lead to the development and maintenance of an eating disorder (Sundgot-Borgen, 1994).

The literature available investigating the link between physical activity and eating disorders has focused on the relationship between involvement in competitive sports (e.g. gymnastics and running) and pathogenic weight control behaviours, for example, fasting, self-induced vomiting, use of diet pills, laxatives and diuretics (Rosen & Hough, 1988).

Critics have argued that these links are more likely due to common personality factors such as compulsiveness and high levels of body awareness between some highly motivated exercisers and those suffering from eating disorders (Biddle & Mutrie, 2001). However, the increasing prevalence of eating pathology within female athletic populations highlights the importance of understanding more about this relationship (Sundgot-Borgen, 1994).

The extent to which excessive exercise is a predisposing factor in the aetiology of an eating disorder is still unclear. To date, there has been little research exploring the role of physical activity and its relationship to eating disorders within a female adolescent population.

As adolescent females are a high priority for primary prevention (Slade *et al.* 1990), exploration of this relationship within a non clinical sample could generate valuable information. This information could be useful in the development of prevention programmes for schools and colleges. Many believe that early identification and intervention can lead to better prognosis and outcome (Szmukler & Dare, 1991).

The current research was a survey study that explored the association between motivation to exercise and attitudes to eating in a non clinical sample of adolescent girls aged between fourteen and sixteen years. The study also explored the association between mood and self-esteem in relation to exercise and eating as previous research suggests both these factors are important in the development of eating disorders (Button *et al.* 1996).

A comprehensive literature review will be presented critically discussing the research literature available. As a means of providing necessary context the first section of this review will describe the development of typical adolescence.

Discussion regarding atypical adolescence and the development of eating disorders will follow. The positive and negative effects of exercise will then be discussed.

The review will then critically evaluate studies investigating weight control and disordered eating in athletic populations and discuss how these findings generalise to normal populations. This will be followed by an evaluation of the literature investigating the role of exercise in the development of clinical eating disorders.

Finally, discussion will focus on a specific population namely, adolescent girls and review the literature concerning weight control methods and the development of eating disorders within this population. Rationale for the current research will be presented and the hypotheses will be outlined.

1.2 Typical Development in Adolescence

Mead (1975) proposed that adolescence involves a gradual transformation of the person as a child into an adult. Geldard and Geldard (1997) proposed that adolescent development can be considered in terms of the following challenges which inevitably occur:

- Biological challenges
- Cognitive challenges
- Psychological challenges
- Social challenges
- Moral challenges

1.2.1 Biological Challenges

Colarusso (1992) suggested that adolescence begins with puberty. This refers to the biological events, which surround the first menstruation in girls and the first ejaculation in boys. Other physiological changes also take place at this time. The young person grows in height, weight, strength, and develops sexually. These changes occur at different ages and different rates for young people.

Other changes in puberty involve the production of sexual hormones that result in an increase in sexual arousal, desire and urge in both males and females. Blos (1970) proposed that in early adolescence (11-14 years) young people tend to form close relationships with friends of the same sex because they feel secure

with them. This is part of the process of movement away from dependence on parents and family. Later adolescence (15-18 years) brings acceptance of the new physically and sexually matured body, and typically there is a move towards sexual relationships.

1.2.2 Cognitive Challenges

Piaget claimed (1948/66) that during early adolescence young people typically make the transition from the concrete operational stage to the formal operational stage. That is, they move from the limitations of concrete thinking and are able to deal cognitively with ideas, concepts and abstract thinking. Flavell (1977) suggested that adolescents learn how, from their own perspectives, to understand or “make sense of” other people. This enables them to make decisions about how to interact with others.

Knight, Dubro and Chao (1985) proposed that the ability of young people to perceive, comprehend and retain information seemed to improve with age. Additionally, adolescents progressively develop the ability to make better use of memory strategies and are more able to detect contradictions (Keil, 1984).

Finally, adolescents develop the ability to think critically and creatively. Pierce, Lemke and Smith (1988) suggested that adolescents are more able to use their capacity of logical thinking to make judgements and decisions for themselves. Their capacity for creative thinking involves flexibility and originality.

1.2.3 Psychological Challenges

The biological and cognitive changes, which have been described above, not only present challenges directly, but also have a significant impact on psychological development. Archer (1992) proposed “individuation” as an important process that takes place during adolescence. Individuation involves the development of relative independence from family relationships, the weakening of ties to objects, which were previously important to the young person, and an increased capacity for the young person to assume a functional role as a member of adult society.

As a result of the individuation process, peer group affiliation becomes important (Schunk, 1984). Schunk (1984) proposed that in early adolescence there is a requirement to find a peer group with which to become affiliated so that the need for belonging can be met. If young adolescents are not accepted by a peer group they may experience alienation. In the longer term they may find themselves unaffiliated and have difficulty developing social support networks.

In later adolescence, another important psychological task for the adolescent is the formation of a personal identity (Waterman, 1992). Adams and Marshall (1996) suggested the following as the most commonly recorded functions of personal identity: -

- Providing the structure for understanding about oneself.
- Providing the meaning and direction through commitment, values and goals.
- Providing a sense of personal control and free will.
- Enabling a consistency, coherence and harmony between values, beliefs and commitments.
- Enabling the recognition of potential through a sense of future possibilities and alternative choices.

Adolescents continually have to adjust to new experiences, this can be both stressful and anxiety provoking. Shave and Shave (1989) proposed that the adolescent development stage is characterised by emotional reactivity and a high intensity of emotional response. This makes it difficult for adolescents to control their behavioural responses, which at times may be inappropriately extreme.

1.2.4 Social Challenges

Geldard and Geldard (1997) proposed that a major challenge for most adolescents was the process of socialisation, which involves an adolescent's integration within society. This process occurs at the same time as the search for personal identity. Socialisation enhances the sense of personal identity and assists the adolescent in dealing with society's expectations and standards.

Ianni (1989) proposed that in communities where adults express consistent values and expectations, adolescents develop a positive sense of self. In contrast,

in communities where family, school and communities fail to offer a consistent direction, adolescents' drift towards undesirable behaviours, tend to become confused and cynical and experience a generally diffused sense of self.

Adolescents who are overwhelmed by society's expectations may revert to anti-social behaviour and become involved in behaviours ranging from low-level delinquency to serious crime (Geldard & Geldard, 1997).

Ianni (1989) argued that the adolescent can only construct a personal identity in the context of relationships with others, having relationships with others unquestionably involves respecting and responding appropriately to their expectations.

1.2.5 Moral Challenges

During adolescence the young person is confronted and challenged by a wide range of moral decisions. Kohlberg (1968, 1984) suggested a model that outlined stages of moral development based on ways of thinking about moral matters. He proposed the following moral development model: -

- Stage One: Pre-conventional morality (aged between 4 and 10 years). In this stage the child will do good or avoid wrong with a motive of either avoiding punishment or receiving a reward.

- **Stage Two: Conventional morality (aged 10-13 years).** During this stage the child or adolescent learns to conform to the society in which he/she lives. The motives for doing well or avoiding wrong depend on the approval of older people. Additionally, there is more emphasis on conforming to law and order.
- **Stage Three: Post-conventional morality (aged 13 years onwards).** During this stage the individual develops a sense of human rights and starts to develop a conscience. No longer does the individual act merely out of fear or the need for approval. Instead, moral principles are integrated within, and owned by, the individual.

1.2.6 Summary

Adolescence is clearly a time of challenge and change. For some adolescents this period presents the possibility of undesirable developmental changes. When an adolescent is unable to confront and deal with these changes successfully there are likely to be unhelpful psychological, emotional and behavioural consequences. The next section will discuss some of these difficulties in relation to the development of eating disorders.

1.3 Atypical Development in Adolescence

1.3.1 Difficulties with Personal Identity and the Development of Eating Disorders

As already described the establishment of a clear sense of identity is one of the major tasks of adolescence. Allport (1937) describes two aspects of the self-image: firstly, the way the individual sees their present abilities, status and roles; and secondly, what they would like to become in the future. Allport (1937) proposed that when there is a large discrepancy between the adolescent's self-image and their idealised self there is also likely to be anxiety and over sensitivity.

At the foundation of adolescent self-awareness "the self-image" is a representation of their body; what it is like and how it looks to others. This self perception can be strongly influence by cultural and societal norms. The importance of body image to our culture as a whole is obvious in terms of the widespread expenditure of time and effort that is given to the body's appearance.

Many adolescents absorb the attitudes of others towards their body and they may possess a body image that is reassuring, even pleasing. Many adolescents struggling to cope with all the changes that this developmental period brings may come to view their body and its parts as off-putting and shameful. (Shave & Shave, 1989).

For many young women intense dieting, exercise and in some cases purging are the extremes deemed necessary to align their own self-image with the cultural or societal norm. Hsu (1990) suggested that adolescent dieting could be a precipitating factor in the development of an eating disorder. In his opinion these dangers can be exacerbated if dieting is intensified by adolescent turmoil, low self-esteem, poor body-concept and poor identity formation.

1.3.2 Epidemiology and Aetiology of Eating Disorders in Adolescents

About three to four per cent of the adolescent female population suffer from eating disorders, with anorexia nervosa and bulimia nervosa being most common. The prevalence of anorexia nervosa among adolescent girls is about one per cent, whilst the prevalence of bulimia nervosa is between one and three per cent (Szmukler & Patton, 1995; American Psychiatric Association, 1993; Bryant-Waugh & Lask, 1995a, 1995b).

Doyle and Bryant-Waugh (2000) suggest that epidemiological reports estimating the prevalence of eating problems in children and adolescents are fraught with methodological problems such as inconsistent diagnostic criteria that do not take full account of the variations in eating disorders seen in clinical practice.

The aetiology of eating disorders such as anorexia nervosa and bulimia nervosa is still not clear. Carr (1999) proposed that anorexia nervosa is typically associated with the transition from childhood to adolescence, and in most cases bulimia nervosa reflects the transition from adolescence to young adulthood.

However, this would not explain the incidence of either disorder in pre-adolescent children.

Social classes one and two (the highest socioeconomic strata) appear to manifest more cases of anorexia nervosa than other sections of society (Margo, 1985). Fosson *et al.* (1987) replicated this finding, 46 per cent of their sample were from social classes one and two.

Doyle and Bryant Waugh (2000) argued that these findings are difficult to interpret as they only really provide information about children presenting for treatment. They suggested that middle class families are better at making use of facilities, which could account for the over representation of these social classes in treatment. A number of studies on non clinical populations have failed to show that social class is a significant risk factor in the development of eating disorders (Patton *et al.* 1990).

Until recently eating disorders have been thought of as a culture bound syndrome that occurs predominately in Caucasians from Westernised cultures. There are a number of studies that have challenged this view. Rathner *et al.* (1995) compared two countries in Eastern Europe to a Western country. Findings suggested that there were no significant differences between the respondents on two eating disorder questionnaires, indicating that eating difficulties are not bound only to the West.

In more recent work Bhadrinath (1990) reported the development of eating disorders within Asian children, concluding that in view of the increasing incidence, there is a need to understand culture specific attitudes towards food and eating in different cultural groups.

1.3.3 High Risk Groups

A number of groups of adults have been identified as “high risk” populations for the development of eating disorders. Hamilton, Brooks-Gunn and Warren (1985) found that up to 23 per cent of adult dancers had been affected by anorexia nervosa. Similarly, in an adolescent sample (mean age 18.5 years) it was reported that 6.5 per cent of dancers had anorexia nervosa (Garner & Garfinkel, 1980). Whilst inconsistent diagnostic terms made these findings difficult to interpret and generalise, comparison studies of non dancers revealed a much lower prevalence of the disorder (Garner & Garfinkel, 1980).

Research findings have also indicated that body image problems and eating disorders are over-represented in some groups of female athletes (Taub & Binde, 1992). Sundgot-Borgen (1994) found that just above one per cent of female athletes met diagnostic criteria for anorexia nervosa and eight per cent for bulimia nervosa. (American Psychiatric Association. (1994). *Diagnostic and Statistical Manual of Mental Disorders* (4th Ed)). Conceptual difficulties with definition of “athlete” status and measurement of exercise have made these findings difficult to interpret and generalise.

1.3.4 Summary

The aetiology of eating disorders in adolescence is far from clear. The transition from childhood to adolescence is a crucial time in the development of personal identity. When this development process is difficult, the individual may develop difficulties with sense of self, related body image and body concept (Carr, 1999). Some adolescents may adopt dieting strategies to change their appearance and Hsu (1990) suggested that dieting may be a precipitating factor into the development of an eating disorder.

Some groups of individuals engaging in physical activity would appear to be more at risk. These observations have led to several proposals suggesting a link between physical activity/sport participation and the development of eating disorders (Sundgot- Borgen, 1994). At this stage the role of physical activity and exercise in the development of eating disorders is still unclear.

1.4 Effects of Exercise in Adolescence

Throughout the last two decades there has been an increase in the numbers of girls and women participating in sport and physical activity (Weiss & Barber, 1995). This has been associated with many positive benefits. Participation in sports during childhood and adolescence in females has been shown to improve fitness, have positive effects on self-esteem, and result in an increased likelihood that the participant will be more physically active later in life (Sands *et al.* 1997).

Increased participation in physical activities can also be associated with some potentially harmful effects (Biddle, 1993). This section will discuss in more detail both the positive and harmful effects of exercise in childhood and adolescence.

1.4.1 Positive Effects of Exercise

Biddle and Mutire (2001) reviewed the research literature and concluded there is general agreement that exercise is associated with reduced anxiety state, and decreased level of mild to moderate depression. Long-term exercise is usually associated with reductions in traits such as neuroticism and anxiety and can result in the reduction of various stress indices.

These findings clarify that exercise can produce positive mental health changes; however, these data are almost exclusively based on adults. Given that physical activity can have positive emotional effects and that children do suffer from emotional difficulties, identifying and understanding more about the reasons or causes of children's activity patterns needs to be a clear priority in fostering good mental health (Biddle, 1993).

Brown and Siegal (1988) conducted one of the few studies involving children in this area. They investigated the effect of physical activity and life stress on the health of 200 adolescent girls' aged between 11 and 15 years. Findings suggested that illness was associated with life stress but was significantly mediated by physical activity patterns. Specifically they found that under high

levels of life stress, girls reporting a greater number of episodes of illness had significantly lower activity levels.

This study defined life stress as a physiological response, and focused more on the biological mechanisms of stress. The study investigated the associations between illness and stress and how this was mediated by physical activity, it did not focus on psychosocial measurement. To understand more fully the relationship between physical activity and psychological aspects of life stress, psychosocial aspects of functioning need to be investigated further in an adolescent population.

1.4.1.1 Effects of Exercise on Self-Esteem

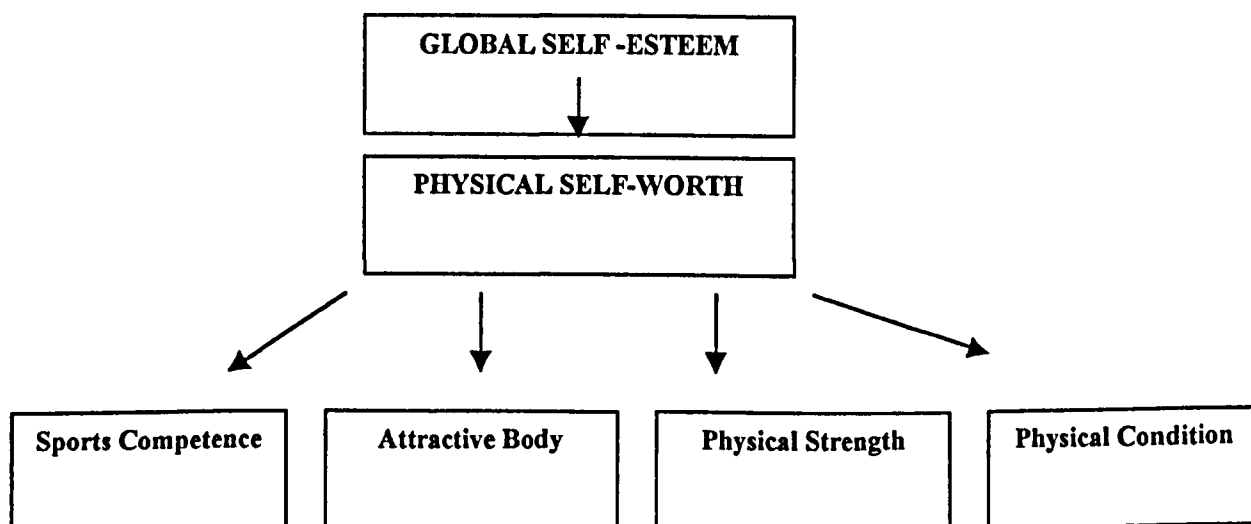
For many years the fields of psychiatry, psychology and sociology have demonstrated an interest in the area of self-image and self-esteem in adolescence. As already mentioned, adolescence is a key development phase for self-esteem (Geldard & Geldard, 1997).

Gruber (1986) conducted a meta-analysis of studies showing evidence of a positive influence of exercise on self-esteem. He found an overall effect size for physical activity on self-esteem of 0.41. Children in studies experiencing a physical activity intervention displayed self-esteem scores nearly one half of a standard deviation (0.41) higher than equivalent children in control groups. These findings suggested that physical activity appeared to have a positive effect on children's self-esteem.

Fox (1988a) proposed a multi-dimensional model of self-esteem suggesting that overall self-esteem (termed global self-esteem) could comprise several separate components. Fox (1988a) claimed that by using this model it was possible to clarify which separate components of self-esteem are most influenced by physical activity.

He suggested that global self-esteem could be comprised of a measure of physical self-esteem, which in turn, may be comprised of further differentiated self-perceptions (see Figure 1)

Figure 1 - Fox's Model of Self-Esteem (1988a)



Within the model global self-esteem was related to physical self-worth, which, in turn, was related to sports competence, attractive body, physical strength and physical condition. Fox (1988a) found preliminary support for this model with 10-12 year old children.

Findings suggested that the four sub domains of physical self-worth (sports competence, attractive body, physical strength and physical condition) were verified within the sample. Global self-esteem and global physical self-esteem were hierarchically related. Those children with low perception of self-worth in the sub domains, but who rated the sub-domains as being important to them, were those who displayed the lowest global and physical self-worth scores.

This study highlighted the importance of individual self-perceptions in relation to self-esteem. Fox (1988a) claimed that it is logical for global self-esteem to be greater when the physical aspects of the self are highly valued. Research of this nature highlights that physical activity can impact positively on children's self-esteem.

1.4.2 Negative Effects of Exercise

1.4.2.1 Sports Stress

In addition to the mental health benefits of exercise it has also been suggested that some harmful effects might accrue from involvement in physical activity. One such harmful effect has been termed in the literature as "sports stress" (Passer, as cited in Biddle, 1993).

Sports stress refers to the potentially negative influence of stress on children in competitive sports. Passer (as cited in Biddle, 1993) suggested that negative competitive outcomes, the appraisal of these outcomes, the responses of adults

and peers to performance and the expectations held by the child could all be factors that contribute to causing anxiety and stress.

A combination of these factors may contribute to the development of competitive trait anxiety – a disposition to perceive competitive situations as threatening, resulting in elevated levels of state anxiety and stress. Dishman (1989) reviewed the literature relating to sports stress, and suggested that on the basis of evidence it would seem that concerns about excessive stress associated with competitive sport are largely unfounded.

Furthermore, review evidence suggested that expectations may be greater in academic contexts than in sport (Dishman, 1989). In most instances, since sport is almost wholly a voluntary activity participants finding it stressful or unpleasant are more likely to withdraw rather than experience state anxiety (Dishman, 1989).

1.4.2.2 Exercise Addiction

Another potentially negative effect of physical activity is “exercise addiction”. Exercise addiction refers to when people become overly involved and obsessed with exercise to the point of neglecting other responsibilities such as job and family. They may also experience negative moods when they are unable to exercise. (De Coverley Veale, 1987).

Within the literature the term “addiction” has been interchanged with other terms such as “athlete’s neurosis” (Little, as cited in Loumidis & Wells, 1998) and

“obligatory exerciser” (Pasman & Thompson, 1988). De Covereley Veale’s (1987) term “exercise dependence” appears to be the most clinically useful, with a constructed set of criteria for diagnosing exercise dependence, which includes both traditional biomedical criteria for addiction (e.g. tolerance and withdrawal symptoms) and psychosocial perspectives (e.g. interference with other areas of life).

Attempts have also been made to develop measures of exercise dependence (Odgen, Veale & Summers, 1997). These measures have conceptualised dependence as a combination of both traditional models of addiction in terms of factors such as withdrawal, tolerance, repetitive behaviour, excess and psychosocial perspectives in terms of factors such as psychological consequences and effects on interpersonal relationships.

Studies of exercise dependence are important to the understanding of the role of exercise. However, most of the research has been conducted on non clinical populations and therefore reveal little about the existence of these phenomena in clinical populations.

Furthermore, there is no research investigating these phenomena in an adolescent or child population. The measures that have been developed have all focused on adult behaviours. There are no standardised assessments to measure this aspect of exercise functioning in a child or adolescent population.

1.4.3 Summary

This section has been concerned with studies evaluating both the positive and negative effects of exercise in adolescence. Whilst there seems to be evidence for the positive effect of exercise on self-esteem, evaluating the more harmful effects of exercise has been harder. Most of the studies investigating the harmful effects of exercise have focused on adult populations, making it difficult to reach any conclusions as to the validity of these findings in child and adolescent populations.

1.5 Exercise and Eating Disorders In Athletes

One possible harmful effect of exercise that has yet to be discussed, is the use of exercise as a form of weight control and how this may lead to unhealthy eating behaviours and in some the development of eating disorders. The next section of this review will focus more on this potential harmful effect of exercise.

As already mentioned in this review, female athletes appear to be a high-risk group for developing eating disorders (Sundgot-Borgen, 1994). In light of this finding discussion will focus on the development of eating disorders in athlete populations. Most of the research evaluated will focus on adult populations, as this is where most of the research has been conducted, citing where possible examples drawn from adolescent populations. In many of these studies the definition of athlete differs, where possible definition of the term used in the study will be presented as findings are discussed.

1.5.1 Risk Factors

Smolak, Murnen and Ruble (2000) claim that disordered eating occurs in all areas of sport participation but is not equally represented across all sports. They suggested that there are differential risks for the development of disordered eating patterns in sport populations. They proposed three different relationships between sport participation and disordered patterns of eating: -

- ♦ Direct relationship between disordered eating and sport – this is when participants (both men and women) feel pressure to decrease body fat, lose weight, maintain a sub optimal weight or attain a small or thin body size and shape for their sport.

Most studies in this area have shown that athletes who compete in sports that emphasise leanness to enhance performance i.e. distance running, lightweight rowing and wrestling tended to be at greater risk (Garner, Rosen & Barry, 1998).

- ♦ Indirect relationship between disordered eating and sport - this is when losing weight or body fat does not necessarily enhance physical performance.

Examples of an indirect relationship might include the use of unhealthy weight control methods such as vomiting or laxative use to alleviate pressure and anxiety associated with sport performance.

- ♦ Disordered eating unrelated to sport - this is when the disordered eating is unrelated to the sport.

In these cases the individual would engage in disordered eating because of life issues that put them at risk that are unrelated to sport participation.

1.5.2 Participation in Gymnastics

As already suggested, participation in sports such as gymnastics may well present as a risk factor for disordered eating as a thin and attractive appearance contributes to the overall standard by which performances are judged.

Research on female gymnasts has suggested that some are likely to show pathogenic weight-control behaviours such as self-induced vomiting, use of diet pills and laxatives, or binge eating (Rosen & Hough, 1988). Gymnasts are more likely to consume diets low in recommended nutrients and calories and to be lacking in nutritional knowledge (Calabrese, 1985).

Harris and Greco (1990) attempted to investigate the relationship between disordered eating and physical activity by investigating weight control and weight concern in a sample of competitive female gymnasts.

Whilst this study did not have a control group, the study did use clinically valid and reliable scales Eating Disorders Inventory (EDI, Garner, Olmstead & Polivy, 1983) and the Eating Attitudes Test (EAT- 26 Garner *et al.* 1982). They

reported scores higher than norms but not clinically significant. All participants had lower body mass indexes than average.

Qualitative reports from the study suggested that participants felt that even a small weight gain would have a deleterious effect on their performance and experienced a number of unpleasant feelings when they weighed more than they wished, which was most of the time.

These findings suggest that the sample were concerned with weight control and weight loss. There was a preoccupation regarding weight and weight gain that was higher than the non clinical population indicating that the female gymnasts who took part in this study were more concerned than normal with weight concern and weight issues.

1.5.3 Participation in Running & Triathlons

Virnig and McLeond (1996) attempted to investigate the relationship between eating and different forms of exercise by comparing a group of runners (both male and female) with triathletes. They hypothesised that runners and triathletes belonged to two distinct subcultures, and participated in sport for very different reasons.

They suggested basic differences between the two sports proposing that triathlon participation requires training for three very disparate sports (swimming, biking and running). Furthermore the ideal body type for a swimmer is distinct from that

for a biker and likewise a runner. Generally, a swimmer welcomes some buoyancy (i.e. body fat), whereas excess weight is anathema to a runner and bikers require strength and stamina.

The study reported no clinically significant differences between groups concerning weight and weight control issues (EAT- 26; Garner *et al.* 1982). Females displayed more disordered patterns of eating than males, implying that females had a greater tendency to be preoccupied with weight control issues than males.

A methodological flaw common to both studies is that they relied on voluntary responses. This may have lead to some form of response bias within the sample i.e. those who chose not to respond to the questionnaires may have had more distorted views and because of that chose not to participate in the study.

Findings from both studies suggest that whilst clinical levels of eating disorders were not apparent in either sample, scores were higher than norms for females, indicating that females were more concerned than normal with weight control and weight loss. This work appears to further support the idea that females who participate in high levels of physical activity may be more at risk of developing eating disorders.

1.5.4 High School Athletes

Rainey *et al.* (1998) assessed the relationship between physical activity (athletic participation) and weight control practices among high school athletes. Findings suggested that diet quality improved as athletic participation increased indicating that athletic participation is not necessarily an antecedent of unhealthy weight control practice in high school athletes.

The findings of this study need to be considered in light of several limitations. The study used a non-standardised self-report measure, which did not include any specific measure of eating disordered behaviour and thus may not have been sensitive enough to measure this variable. The sample used for the study was involved in team sports. It has been suggested in the literature that physical activity that involves team participation does not pose the same risk as highly competitive individual physical activities (Davis, 1992).

Burak and Miller (2000) advanced these findings by assessing the weight control practices of middle school athletes. In this study they ensured all participants engaged in at least one sport competitively either during school, after school or as part of a town team.

On average each participant engaged in at least four types of physical activity. The study used a standardised questionnaire “The Kids Eating Disorder Survey (KEDS) an instrument whose reliability and validity had been previously assessed (Childress *et al.* 1993).

Findings indicated that many of the students who participated in the study exhibited potentially dangerous practises and behaviours. More than 36 per cent of the students indicated that they wanted to lose weight and more than 44 per cent declared they looked fat. Moreover, the majority of participants had a body mass index that fell into the healthy range.

The study reported 20 per cent of the students stated that they used sports participation to lose weight and 36 per cent claimed they used sport participation to maintain weight. Whilst participation in certain sports has been determined to be a higher risk for disordered eating behaviour, these findings indicated that more than a third of the students playing any sport believed they looked fat and more than a fourth of athletes playing any sport wanted to lose weight (Yates, 1996).

1.5.5 Summary

Many of the findings reported in these studies support the notion that athletes do have an intense awareness of body size and shape. This heightened awareness combined with competitive pressure for exceptional performance and pre existing sociocultural pressures (females to be thin and males to be muscular) make it more likely for these athletes to engage in detrimental health behaviours such as disordered patterns of eating.

1.6 Exercise and Eating Disorders in Other Populations

This review will now evaluate critically studies using different methodologies. These studies have attempted to compare athletes and non-athletes to explore further whether those participating in sport are at a greater risk for developing significant eating pathology.

1.6.1 Athletes versus non-athletes

Fulkerson *et al.* (1999) compared scores on the EDI (Garner, Olmstead & Polivy, 1983) between high school athletes and non-athletes. The study found no significant differences between athletes and non-athletes in the majority of eating disordered behaviours and attitudes. When significant differences were demonstrated, the athletes had more positive attitudes and behaviours than the non-athletes.

Both male and female athletes indicated less negative views of life than their non-athletic counterparts with female athletes demonstrating more self-efficacy than female non-athletes. The authors suggest that it is possible that athletic participation may enhance self-efficacy, thereby serving as a protective factor against the development of disordered eating.

Another possible explanation for these findings may be that many of the athletes involved in the study were participating in team sports, which may not focus

attention on body weight. As previously mentioned it is the sports that emphasise body leanness that may pose most risk.

The definition of athlete versus non-athlete was determined by the amount of sport participation at high school. Thus athlete versus non-athlete status was determined more by the amount than the type of exercise. There was no assessment of the reasons given for exercise, which may have provided more insight into motivations for participation in sport.

DiBartolo and Shaffer (2002) also used a between-group design comparing female athletes and non-athletes on measures of eating behaviours and attitudes (EAT- 26 Garner *et al.* 1982), psychological well being (Self Perception Profile for College Students (SPPCS); Neeman & Harter, 1986) and reasons for exercise (Reasons for Exercise Scale (RFES); DiBartolo, Lin & Shaffer, 2001). The study found that female athletes reported fewer eating disordered symptoms and more positive affect than female non-athletes. In addition, when considering motivation for exercise, athletes were more likely than non-athletes to exercise for health and enjoyment reasons.

An additional strength of the design used in this study was that when participants were recruited the purpose of the study was not fully disclosed. Students were told that they would be completing a number of questionnaires examining self-perception and health habits. The choice of methodology may have averted potential response bias reducing the chances of athletes with eating disorder symptoms opting out of the study.

From the research conducted to date it would seem that susceptibility to disordered patterns of eating might be higher for those involved in sports that emphasise leanness, aesthetics and those participating in sport at a competitive level. There is little to suggest that those exercising at a non-competitive level are at risk of developing any form of eating pathology. On the contrary, it would appear that those who do not engage in exercise have higher levels of disordered eating than those who do.

1.6.2 Clinical Populations

There have been many studies that have attempted to explore further the role of physical activity in the development of eating disorders. The diagnostic criteria for anorexia nervosa and bulimia nervosa include excessive physical activity as a possible symptom of both disorders (DSM IV, 1994).

Hyperactivity has been found in between 38 and 80 per cent of cases with anorexia nervosa and also among normal-weight subjects with bulimia nervosa (Kron *et al.* 1978; Crisp *et al.* 1980; & Davis *et al.* 1997). This implies that physical activity may be a risk factor for the development of clinical eating disorders.

Long *et al.* (1993) compared 21 female anorexic in-patients (mean age 25) all of whom met DSM IV (1994) diagnostic criteria for anorexia nervosa with 45 single males (mean age 24.9) and 25 single females (mean age 24.6) without eating disorders.

Within the clinical sample, mean scores on both the Eating Attitudes Test (EAT 40; Garner & Garfinkel, 1979) and the General Severity Index of the Brief Symptom Inventory (BSI; Derogatis & Spencer, 1982) indicated a clinically significant level of psychological distress.

All participants (n=91) completed two non-standardised questionnaires to assess their exercise behaviour and attitudes. Measures focused on exercise behaviours covering frequency and duration of exercise, solitary/secret exercise, the association between eating, exercise and hyperactivity. Data were also collected on exercise cognitions covering motives for exercise, perceived adequacy and importance of exercise, feelings after exercise or failure to exercise.

The study found significant differences in exercise behaviour between the non clinical and clinical sample. The clinical sample (n=21) participated in significantly more exercise activities per week, and were more likely to exercise daily and in a secret or solitary manner than the non clinical sample.

Participants in the clinical sample exercised on average more frequently and for longer than participants in the non clinical sample. Furthermore, the type of preferred exercise differed between groups. Walking was the most popular form of exercise in the clinical sample compared to swimming or cycling for the non clinical sample.

This study demonstrated significant differences in exercise behaviours between a clinical and non clinical sample. Females in both the groups placed a similar

emphasis on weight control as a reason to exercise. This suggests that it is not necessarily the weight control that precipitates the excessive exercise. Touyz, Beaumont and Hook (1987) found that anorexics gave their initial motivation for exercise as the pursuit of fitness.

Beaumont *et al.* (1984) proposed that as the illness progressed the exercise becomes reinforced by the weight loss and thus also becomes a strong maintaining factor in the progression of the disorder, which has important implications for treatment.

It is unclear whether the characteristic hyperactivity seen in clinical eating disorders is self-correcting once weight is restored to normal (Crisp *et al.* 1980). This also had important clinical implications for treatment and recovery. Excessive exercise may place the weight recovered anorexic at risk of relapse.

Kaye *et al.* (1986) found that in the early months post-treatment weight-recovered anorexics required a higher than normal calorie intake to maintain a stable weight and had a concurrently elevated level of activity. These factors could make continued weight maintenance more difficult and have a considerable impact on the physical and psychological recovery process.

This study also demonstrated significant differences to attitudes to exercise across gender. Whilst female participants in both the clinical and non clinical groups placed a similar emphasis on weight control as a reason to exercise, males were significantly more likely to exercise for reasons of competition and

enjoyment. This implies that reasons for exercise, are as important as quantity of exercise in the development of eating disorders.

1.6.3 Obligatory Exercisers

Within the exercise literature several papers have referred to the term “obligatory exerciser” to refer to a subset of exercisers (both male and female) who experience a powerful subjective need to exercise, and are reluctant to cease exercising for any reason (Pasman & Thompson, 1988; Yates, 1991).

Characteristics of the obligatory exerciser include maintaining a rigid schedule of intense exercise, feelings of guilt and anxiety when the exercise schedule cannot be followed, a preoccupation with food and lean body mass and pushing oneself to exercise even when tired, ill or injured (Yates, 1991).

Within the literature there is some evidence that “obligatory” aspects of exercise are important in the context of disordered eating (Yates, 1991; Davies, 1992; & Slay *et al.* 1998). It has been suggested that psychological traits such as weight preoccupation, body image dissatisfaction, low self-esteem and depression observed in women with eating disorders are similar to those seen in some obligatory exercisers (Yates, 1991; Yates, Leehey & Shisslak, 1983).

Some studies have suggested a relationship between exercise and eating disordered attitudes and behaviours (Brehm & Streffen, 1998; Pasman &

Thompson, 1988). Whilst other studies have demonstrated no such associations (Iannos & Tiggeman, 1997; Nudelman, Rosen & Leitenberg, 1998).

The difference in findings from these studies may have been related to the sample population. Disparate findings may also be attributed to the problem of identifying excessive exercisers using a valid measure of the construct. A variety of methods have been used to identify the excessive exerciser, including direct questions or unidimensional scales that assess only the frequency and intensity of the exercise.

Brehm and Steffen (1998) used factor analysis to show that there were several dimensions to the Obligatory Exercise Questionnaire (OEQ; Thompson & Pasman, 1991). They demonstrated that subscale correlations between the EDI (Garner, Olmstead & Polivy, 1983) and the OEQ (Thompson & Pasman, 1991) consistently surpassed the OEQ total in a comparison of their correlations.

The most notable finding being the substantial contribution of the emotional element of exercise factor to predictions of all EDI (Garner, Olmstead & Polivy, 1983) subscale scores. Those who displayed a high degree of emotionality about their exercising and who became distressed with missed exercise sessions seemed to view it as an obligatory activity.

1.6.4 Summary

Many of the studies described here suggest that it is not the amount of exercise undertaken but rather the feeling associated with the exercise activity that links exercise and eating disorders. Thus excessive exercisers can be subdivided into at least two groups: those for whom exercise has a highly charged psychological meaning and those for whom it does not. The disposition of the exerciser toward the exercise may well be the key to linking problematic exercise and eating disorders.

1.7 Exercise and Eating Disorders in Adolescent Girls

This review will now evaluate the literature regarding the development of eating disorders in adolescent girls, focusing on discussion of the prevalence of dieting, the role of self-esteem and the role of exercise in non clinical samples.

1.7.1 Prevalence of Dieting in Adolescent Girls

The literature suggests that dieting for weight loss or weight control is a widespread practice among adolescent girls (French & Jeffrey 1994). Serdula *et al.* (1993) found that 44 per cent of adolescent girls are trying to lose weight and an additional 26 per cent are trying to prevent weight gain. More recent data suggests that the greatest number (19 per cent) are dieting in Year 10 (school age 14-15 years) with an additional 30 per cent indicating that they believe their weight is too high (Coleman & Schofield, 2001).

In summary then, from these findings, almost two thirds of adolescent girls, the majority of whom had a healthy body mass index were attempting to control their weight. The high prevalence of dieting amongst young women and the unhealthy behaviours associated with some forms of dieting makes understanding these behaviours a high priority for public health.

1.7.2 Methods of Dieting

There are a number of dieting methods that are associated with healthy weight loss for example, low fat diets, and low calorie diets (French, Jeffrey & Forster as cited in French *et al.* 1995). There are also a number of dieting methods that are associated with unhealthy behaviour changes such as fasting, skipping meals, the use of diet pills, appetite suppressants, laxatives or intentional vomiting and binge eating (French & Jeffrey, 1994).

French *et al.* (1995) conducted a study examining the prevalence of dieting, weight change history, and specific weight loss behaviours in a population based sample of over 1000 female adolescents across grades 9 to 12 (British age equivalent 14-16).

The main aims of the study were to:

- determine the extent to which healthy or unhealthy behaviours are associated with reports of dieting

- to examine the relationship between specific dieting behaviours and history of weight change

The majority of participants reported what would be considered healthy eating and exercise behaviour changes to lose weight. These included increased exercise, eliminating snacking and sweets, eating less food and eating low calorie foods.

These findings suggest that the majority of adolescent girls who diet adopt what would be considered healthy eating and exercise behaviour. Whilst these practices may result in some weight loss they do not result in drastic weight changes.

Moreover, scores on the Restrained Eating Scale (Herman & Polivy, 1980), a 10 item scale which focuses on weight concern, weight fluctuations and emotional reactions to eating and weight were associated with both unhealthy and healthy weight loss methods. This indicates that dieting behaviours both healthy and unhealthy are related to highly restrained eating, but do not necessarily place adolescent girls at risk of developing an eating disorder (Herman & Polivy, 1980).

High levels of weight concern characteristic of “restrained eaters” in young women of any body weight may place them at risk for more pathological eating disordered attitudes and behaviours. Thus restrained eating may be a better

predictor of future eating problems than methods of weight control (Herman & Polivy, 1980).

This study suggested that the majority of adolescent girls who diet adopt what would be considered healthy behaviour changes in an attempt to control their weight. Whilst attention to healthy eating and exercise behaviours is desirable, caution must be observed to ensure that healthy attention to weight related behaviours does not develop into extreme or unrealistic weight changes.

This study used a large population based sample and a variety of specific and detailed measures of dieting behaviours and weight loss history, which undoubtedly improved both the validity and the utility of data collected.

One limitation of the study was that whilst it collected interesting data on the prevalence of behaviours, the research did not yield any data on factors that may affect these behaviours, such as self-esteem, body dissatisfaction or beliefs about exercise. Information regarding these factors may provide valuable information about the type of adolescent who may be at risk for developing disordered patterns of eating.

1.7.3 Self Esteem, Mood and Dieting

Bruch (1973) claims that deficits in self-image (in particular low self-esteem) are often present well before the onset of an eating problem. Empirical evidence

confirmed that eating disordered patients do have lower self-esteem than non clinical control subjects (Dyken & Gerard 1986).

Button *et al.* (1996) conducted a prospective study of self-esteem and vulnerability to eating disorders in girls aged between 11 and 12 years. Findings suggested that low self-esteem was associated with a range of psychological problems including fatness concern at that age.

Participants were then followed up aged 15-16 years where they completed more detailed tests focusing on eating/weight concerns, (EAT 40; Garner & Garfinkel, 1979), self-esteem (Rosenberg Self-Esteem Scale (RSE); Rosenberg, 1965) and wider psychological well being (Hospital Anxiety & Depression Scale (HADS); Zigmond & Snaith, 1983).

Findings suggested that girls with low self-esteem at age 11-12 years were at a significantly greater risk of developing the symptoms of eating disorders as well as other psychological problems by the age of 15-16 years (Button *et al.* 1996). Of those followed up at the age of 15-16 years around four to eight per cent showed evidence of a partial syndrome eating disorder.

This finding is consistent with previous comparable studies in this age group (Mann *et al.* 1983). Moreover, 43 per cent of this sample were classified as having low self-esteem (classified according to Rosenberg's criteria 1965) and about one third scored highly on the HADS (Zigmond & Snaith, 1983).

It could be argued from these findings that excessive weight control and eating disorders are an expression of problems with self-image and low self-esteem. Findings such as these are in keeping with Fox's (1988a) idea of self-esteem as increasingly multi-dimensional and hierarchical. Fox (1988a) suggested that global self-esteem could include a measure of physical self-esteem, which could be comprised of different self-perceptions.

For some young girls self-esteem may comprise of physical self-perceptions. As these girls then mature they become preoccupied with these physical self-perceptions leading them to engage in different types of weight control behaviours that may predispose them to eating disorders.

1.7.4 Exercise and Dieting

Eating disorders are dynamic disorders and because of this the endorsement of specific vulnerability factors in their development becomes very difficult (Hsu, 1990). As already mentioned one of the diagnostic criteria for anorexia nervosa and bulimia nervosa includes excessive exercise activity as a possible symptom of the disorder (DSM-IV 1994).

In anorexia nervosa the intense fear of weight gain may manifest itself in the form of self-imposed starvation, excessive exercise and purging in order to lose weight. Whereas in bulimia nervosa the fear of weight gain may manifest itself as binge eating, self-induced vomiting, use of laxatives or diuretics, or excessive exercise as a form of weight control.

Much of the literature has examined similarities between people who engage in rigorous exercise and people with eating disorders. Few studies have examined why exercisers engage in exercise, and how this relates to the excessive exercise we see in anorexia and bulimia nervosa.

Hubbard, Gray and Parker (1998) sought to assess attitudes and behaviours among women exercisers focusing on why they engage in exercise activity. The study explored differences between women who reported using exercise to work off food consumed and women who denied using exercise for that objective. Findings suggested that women who were exercising to work off food obtained significantly higher scores on the EDI (Garner, Olmstead & Polivy, 1983) than those of the non food related group.

These findings indicated that women who exercised to work off food consumed were using exercise for the same objective as that which motivates the pathological behaviours of some individuals with eating disorders but perhaps not to the same degree.

A further study by Seigel and Hetta (2000) investigated more fully the relationship between obligatory attitudes to exercise and disordered attitudes to eating. They proposed that obligatory attitudes to exercise rather than quantity of exercise would be more related to eating disordered symptoms in a sample of females aged between 17 and 23 years.

Results demonstrated that exercisers with obligatory attitudes obtained significant results on measures of body image problems, recurrent weight-reducing attempts, bingeing and post-prandial impulses to vomit. Whereas no significant results were obtained from high-level exercisers (participants who exercised for more than six session per week for longer than one hour).

This study was limited in the sense it did not use validated standardised measures. However, it supports previous research suggesting that eating disorder symptoms in females seem to be associated with obligatory attitudes to exercise rather than with exercise quantity (Siegel & Hetta, 2000).

1.7.5 Summary

The research discussed here has raised several important questions in relation to groups at risk of developing eating disorders. It would seem from the literature that exercising fosters weight and diet concerns in susceptible individuals because the initial weight loss that often accompanies the physical activity elicits social reinforcement.

Many clinicians describe the aetiology of eating disorders as “multifactoral” (Hsu, 1990). It would appear that there is no single event or factor that causes the onset of eating disorders. Instead a multitude of factors ranging from genetic, psychological, personality, sociocultural and family appear to interact in the development of eating disorders. Whilst the role of exercise in the development

of eating disorders is far from clear, the fact that it has a role would seem to be well established within literature from both clinical and non clinical samples.

The findings from these studies generate many interesting and important questions as to how and why an eating disorder may develop for females engaging in intense physical activity. These findings are in keeping with many of the hypotheses previously suggested in the literature that rigorous exercise activity may be a factor in the aetiology of eating disorders. If as many clinicians propose, the aetiology of eating disorders are multi-factorial exercise could be just one of the many factors that could precipitate development (Hsu, 1990).

1.8 Summary of Literature Review

Brown and Siegal (1988) found that illness relating to life stress could be mediated by physical activity. Fox (1988a) found that physical activity could have positive effects on self-esteem. It would seem that some of the literature reviewed here has suggested that exercise can have positive effects on mental health. However, it is possible that exercise could also have harmful effects on mental health and psychological well-being. Phenomena such as “sports stress”, “exercise addiction” and “eating disorders” are all potential pitfalls of preoccupation with exercise and physical activity.

Smolak, Murnen and Ruble (2000) have suggested that there are some groups of individuals who are more at risk of developing eating disorders than others. Female athletes who engage in competitive sporting activity that emphasises

leanness as a factor that improves performance may be more at risk of developing an eating disorder than female athletes engaging in other sports (Smolak, Murnen & Ruble, 2000).

Seigel and Hetta (2000) proposed that it is attitudes to exercise rather than quantity of exercise that is more related to eating disorder symptoms. Due to several methodological limitations, namely the lack of standardised measures used within this study, it has been difficult to generalise these findings to other populations making implications for primary prevention and intervention difficult.

The role of exercise as a risk factor for the development of eating disorders is far from clear. Much of the research discussed has been conducted on adult populations, there is less research looking at the role of exercise and its relationship to eating within an adolescent population. A study exploring these relationships may provide clinically relevant information, which may be useful in the development of health education programmes aimed at prevention of eating disorders for vulnerable at risk groups

1.9 Recommendations for Future Clinical Research

To date, research has not fully addressed attitudes and beliefs about exercise and how these beliefs relate to and influence eating patterns within female adolescents in a non clinical population (i.e. outside patients with a diagnosable eating disorder).

A study investigating beliefs about exercising and attitudes to eating within a non clinical adolescent female sample could provide more information regarding the role of exercise as a form of weight control. It could also provide useful information regarding the role of exercise in the aetiology of eating disorders.

A research project is proposed that aims to address the gaps in previous research and increase understanding of the role of exercise in the development of eating disorders.

1.9.1 Proposed Outline for Research and Rationale for Methodology

Evidence suggests there are links between exercise and the development of disordered eating (Rosen & Hough, 1998; Harris & Greco, 1990). The majority of studies examining exercise and weight control have been conducted within highly competitive sporting environments, making it difficult to generalise findings to a non clinical adolescent population.

The emphasis on body shape, size and preoccupation with weight control in these environments may be different from that of a non clinical population. Furthermore, the intense focus on exercise may lead to the development of specific beliefs regarding success and failure in relation to sporting achievement.

Findings from preliminary studies investigating exercise in adolescent populations suggests that preoccupation with exercise can result in an unhealthy

awareness of body shape and size and this, in turn can lead to a preoccupation with weight control (Fulkerson *et al.* 1999; Burak & Miller, 2000).

Little work to date has assessed attitudes to exercise and eating in adolescent girls who do not have an eating disorder. A study investigating attitudes to exercise and eating in a non clinical adolescent population may help to explain more fully the link between reasons for exercise and eating patterns. The proposed study is aimed to address this gap.

1.9.2 Clinical Relevance of the Proposed Research Study

A number of areas of clinical relevance of this research project will be outlined.

1.9.2.1 Theory Development

Results may help to explain more fully the link between motivation for exercise and exercise participation. It may provide information on what motivates adolescent girls to engage in exercise and how this can affect their attitudes to eating. Information of this nature may help clinicians to gain a fuller understanding of risk factors linked to eating disorders.

1.9.2.2 Treatment and Preventative Applications

If eating attitudes are related to motivation for exercise, this could be seen as a risk factor in the development of eating disorders. Health promotion and education regarding healthy exercise could be used as a preventative strategy. Early identification of girls with weight control motivations regarding exercise

may alert health professionals or educational services to the risk of their developing an eating disorder thus allowing for preventative action

Possible identification of weight control motivation may aid the clinical work of psychologists. This information would allow clinicians to prioritise therapeutic work on these core motives, as they may be central to the treatment of an eating disorder.

The Exercise Motivation Inventory II (EMI II; Markland & Hardy, 1993) has not been used in a clinical study previous to this. The use of this measure to determine motives for exercise within a clinical population may be of assistance to the assessment work of the psychologist.

1.9.3 Research Question and Hypotheses

The research literature suggests there are several risk factors for the development of eating disorders in adolescent girls. French *et al.* (1995) found that restrained eating in young women may be a risk factor for pathological eating disordered attitudes and behaviours. Button *et al.* (1996) found that girls with low self-esteem were more at risk of developing the symptoms of eating disorders as well as other psychological problems. Seigel and Hetta (2000) suggested that attitudes to exercise rather than quantity of exercise was more related to eating disordered symptoms in a female sample.

In light of these research findings the main aim of this study was to investigate further relationships between motivation to exercise for weight control reasons and attitudes to eating, whilst also considering the impact of self-esteem and mood. Three testable research hypotheses have been proposed based on previous research findings.

1.9.3.1 Hypothesis One

It was predicted that motivation to exercise for weight control reasons measured by the EMI II (Markland & Hardy, 1993) would be related to disordered attitudes to eating, measured by EAT-26 (Garner *et al.* 1982).

Adolescent girls who exercise for weight control reasons will be more likely to obtain high scores on the EAT-26, demonstrating higher levels of eating disordered symptoms.

1.9.3.2 Hypothesis Two

It was predicted that motivation to exercise for weight control reasons measured by EMI II (Markland & Hardy, 1993) would be related to self-esteem, measured by RSE (Rosenberg, 1965).

Adolescent girls who exercise for weight control reasons will be more likely to obtain high scores on the RSE, demonstrating lower self-esteem.

1.9.3.3 Hypothesis Three

It was predicted that motivation to exercise for weight control reasons measured by EMI II (Markland & Hardy, 1993) would be related to mood, measured by Children's Depression Inventory (CDI; Kovacs, 1985).

Adolescent girls who exercise for weight control reasons will be more likely to obtain high scores on the CDI, demonstrating lower mood.

2. METHOD

2.1 Overview of Chapter 2

Evidence presented in the previous chapter suggested links between exercise and the development of eating disorders in adolescent girls. The majority of studies examining exercise and weight control described have been conducted within highly competitive sporting environments (Rosen & Hough, 1988; Harris & Greco, 1990).

Within these environments the intense focus on exercise may lead to the development of specific beliefs regarding success and failure in relation to sporting achievement. The emphasis on body shape, size and preoccupation with weight control in these environments may be different from that of a non clinical population.

As outlined in chapter 1, the main research aim in this study was to investigate attitudes to exercise and eating in adolescent girls who do not have an eating disorder. Preliminary studies investigating exercise in adolescent populations have suggested that preoccupation with exercise can result in an unhealthy awareness of body shape and size, this in turn can lead to a preoccupation with weight control (Fulkerson *et al.* 1999; Burak & Miller, 2000).

2.1.1 Research Question

This study aimed to investigate if motivation to exercise for weight control reasons was related to disordered attitudes to eating, whilst also considering the impact of self-esteem and mood. Three testable research hypotheses were proposed based on previous research findings (See Section 1.9.3). To test these hypotheses, a method was required which would allow the researcher to investigate more fully attitudes to eating and weight control in a non clinical adolescent population.

This chapter will begin by describing the design of this study. Rationale will then be presented regarding the choice of measures. The researcher will outline the research strategy and describe in more detail the process undertaken. This will include description of the initial pilot study and the final procedure.

2.2 Design

A survey design was chosen for the main study as questionnaires are easy to administer, are a cost-effective method of accessing large number of participants and are helpful when clinical interviews are impractical (Wilson, 1993a). A survey based design also followed the trend of other similar research in this area (Fulkerson *et al.* 1999; Burak & Miller, 2000).

The main survey was prefaced with a pilot study, which followed the form of a discussion group to ensure that all questionnaires being used were relevant to the

participant group. The main survey was followed by feedback sessions to each school to ensure completion of the research process.

As the study aimed to investigate relationships between variables, a correlational analysis was proposed. It was hoped on the strength of associations between variables that multiple regression analysis would determine which variables would be most useful in predicting scores on the EAT-26 (Garner *et al.* 1982) RSE (Rosenberg, 1965) and CDI (Kovacs, 1985) within the data set.

Prospective power analysis was used to decide on the sample size required to achieve a given level of power. Cohen (1988) proposed that when an investigator has no other basis for setting power values, a reasonable level of power to aim for is 80 per cent - .80. Using a power value of .80 and predicting a large effect size regression tables indicated that a sample size of approximately 100-150 would give sufficient data to achieve a significant relationship between variables or to confirm the reliability of no effect.

2.3 Participants

This research study focused on adolescent girls: as although eating distress does affect males, it is a much more prevalent problem amongst adolescent girls and women.

A total of 270 girls from three local secondary schools took part in the study. All of the girls who took part in the study were from Year 10 and 11

(14 -16 years). The majority of girls were white (60 per cent), whilst the remaining girls described themselves as Asian (30 per cent), Black (5 per cent) or Other (5 per cent).

The schools were recommended by a local Consultant Child Clinical Psychologist to reflect the range of socio-economic status within the county.

2.3.1 School A

School A was a city council maintained single sex comprehensive community college. The total number of pupils on the school roll at time of data collection was 1165. In August 2002 there were 236 places available for entry into Year 11. In August 2001 60 per cent of students entered for examinations achieved five or more GCSEs' at grades A* to C (National average = 51.5 per cent).

2.3.2 School B

School B was a city council maintained co-educational community college. At the time of data collection there were 1569 pupils on the school roll. In August 2002 there were 332 places available for entry into Year 11. In August 2001 14 per cent of students entered for examinations achieved five or more GCSE's at grades A* to C (National average = 51.5 per cent).

2.3.3 School C

School C was a county maintained co-educational comprehensive college. Since April 1996 school three had been designated a “Technology College”, obtaining additional financial support from the Department for Education and Skills. As a result of this the school was able to offer enhanced provision particularly in the area of information technology.

At the time of data collection there were 1003 pupils on the school roll. In August 2002 there were 475 places available for entry into Year 10. In August 2001 74 per cent of students entered for examinations achieved five or more GCSEs' at grades A* to C (National average = 51.5 per cent).

2.4 Measures

The measures were chosen to explore the associations between the following variables i.) motivation for exercise, ii.) disordered attitudes to eating and iii.) other psychological correlates of eating distress (e.g. self-esteem and mood). A discussion will follow of the measures of these features together with the questionnaires selected for use in this study.

2.4.1 Motivation for Exercise

Within the exercise motivation literature there are no measures available that have been designed specifically for use with child or adolescent populations.

There are several measures that have been developed to assess exercise motives of adults. The Reasons for Exercise Inventory (REI; Silberstein *et al.* 1988) comprises seven scales labelled weight control, attractiveness, tone, fitness, health, mood and enjoyment. The Motivation for Physical Activity Measure (MPAM; Frederick & Ryan, 1993) assesses an even more restricted range of motives, comprising only three scales labelled enjoyment, competence and body-related motives.

Both of these measures have proven useful in testing theoretically driven research questions. A more fundamental problem with these measures of exercise motives concern the lack of a strong theoretical basis. Biddle (1993) argued that the study of participation motives at the descriptive or surface level needs to be embedded within a more theoretical approach.

The Exercise Motivation Inventory (EMI; Markland *et al.* 1992) was the only available measure that had a strong theoretical basis. The EMI (Markland *et al.* 1992) draws on self-determination theory in the sense that some motives can be held to reflect intrinsic or extrinsic motivation. Whilst this knowledge may only be surface level it is important from a practical perspective in the promotion of exercise. An understanding of individuals' participation motives can be useful in tailoring exercise interventions to meet personal needs.

The EMI (Markland *et al.* 1992) comprises 50 items in total. Responses are rated on a five point Likert scale where a score of zero is not at all true and a score of five very true. The individual items combine to form 14 subscales; stress

management, revitalisation, enjoyment, challenge, social recognition, affiliation, competition, health pressures, ill-health avoidance, positive health, weight management, appearance, strength and endurance, and nimbleness.

Studies have supported the validity of the EMI. The authors found that the measure discriminated between women taking part in community aerobic classes and members of a Weight Watchers group taking part in aerobics as part of their weight reduction programme. A discriminant analysis showed that the two groups were significantly differentiated in terms of function defined by exercising for enjoyment, recreation, personal development, fitness, stress management and affiliation.

However, Markland and Hardy (1993) highlighted two main factorial weaknesses with the instrument. Specifically the EMI (Markland *et al.*, 1992) fitness scale, and health related scales were both found to be relatively low in internal consistency. The phrasing of the instrument made it only applicable to individuals who engage in exercise. The authors proposed that it would be useful to be able to measure reasons that non-exercisers would have for exercising in order to determine factors that might motivate initial involvement or re-involvement.

Markland and Hardy (1993) aimed to improve and refine the original EMI (Markland *et al.* 1992) in order to produce a set of valid and reliable indicators of a broad range of participation motives. Modifications were also made to the questionnaire to broaden the applicability of the instrument to non-exercisers as

well as exercisers. Following factorial analysis, a modified version of the EMI (Markland & Hardy 1993) was published. The authors concluded that the EMI II was a factorially valid means of assessing a broad range of exercise participation motives.

One major weakness of the EMI II (Markland & Hardy, 1993) with regard to this study was the fact that it had not been used with an adolescent population before. However, the fact that it had a good theoretical basis and good discriminant validity ensured that statistically it was sound. It was for these reasons that the EMI II (Markland & Hardy, 1993) was chosen as the primary measure of exercise motives in this study.

2.4.2 Eating Disordered Attitudes and Behaviours

An assessment of eating attitudes and behaviours was included to determine whether there were links between motivation for exercise and dysfunctional attitudes and behaviours around eating, weight and shape.

Interest in the objective measurement of the symptoms and psychophysiological features of eating disorders has been reflected in the development of several rating scales over the past three decades. The Eating Attitudes Test (EAT-40 Garner & Garfinkel, 1979) has been proposed as a valid and reliable self-report measure of the symptoms of anorexia nervosa. Whilst The EAT-40 (Garner & Garfinkel, 1979) alone does not yield a specific diagnoses of an eating disorder,

it provides information regarding a wide variety of symptoms that present within eating disordered populations.

Garner and Garfinkel, (1980) found that EAT-40 scores were independent of weight but were related to emotional disturbances in samples of anorexic patients and dance students. Button & Whitehouse, (1981) administered the EAT-40 (Garner & Garfinkel, 1979) to a large sample of students at a College of Technology and reported that the instrument was useful in identifying groups with abnormal concerns about eating and weight.

Garner *et al.* (1982) proposed an abbreviated 26-item version of the EAT-40 (EAT-26) based on a factor analysis of the original scale. The EAT-26 (Garner *et al.* 1982) was found to be highly correlated with the EAT-40 (Garner & Garfinkel, 1979). Results suggested that the three factors form subscales, which are meaningfully related to bulimia, weight, body image variables and psychological symptoms. Adolescent norms for anorexia nervosa and female comparison subjects have also been presented for both the EAT-26 (Garner *et al.* 1982) and EAT- 40 (Garner & Garfinkel, 1979).

On the basis of these findings the EAT-26 (Garner *et al.* 1982) was chosen, as it appeared to be a reliable, valid, economical instrument with female adolescent norms, which could be used as an objective measure of eating distress.

2.4.3 Self Esteem

Self-esteem has been defined as a positive or negative attitude taken towards the self (Rosenberg, 1965). This has been described as important to the aetiology of anorexia nervosa and bulimia nervosa (Button *et al.* 1996). It has also been suggested that exercise has a positive influence on self-esteem (Gruber, 1986). A measure of self-esteem was included to aid assessment of this proposal within the study.

The Rosenberg Self Esteem Scale (RSE: Rosenberg, 1965) was chosen to assess self-esteem. This scale was initially developed to assess self-esteem in adolescent samples, but has since become the most widely used scale in research to assess both children and adults' general self-esteem (Blascovich & Tomaka, 1991).

The RSE (Rosenberg, 1965) consists of ten items that measure global self-esteem as opposed to the often considered multidimensional construct called self-concept (Rosenberg, 1979). There are several different methods of scoring the scale. For the purpose of this study the method suggested by Blascovich & Tomaka, (1991) was used in the data analysis.

Respondents were asked to rate the ten items on a four point Likert scale from strongly agree to strongly disagree yielding scores between 10 and 40. Higher scores indicated lower self-esteem. The Guttman (as cited in Rosenberg, 1965)

method of scoring was also used so the data could be compared to the data collected by Button *et al.*(1996).

Coefficient alpha for the scale on a sample of more than 5,000 high school students was $r = 0.77$ indicating good reliability (Rosenberg, 1965). Several additional coefficient alphas have been reported (all ranging from $r = 0.82$ to $r = 0.87$) for different samples by other researchers (Wylie, 1989). A two-week and seven-month test-retest reliability coefficients of $r = 0.85$ and $r = 0.73$ have been reported for a sample of 28 college students and a sample of 990 Canadian high school students, respectively (Wylie, 1989).

The RSE (Rosenberg, 1965) has received substantial support as a unidimensional or single factor scale (Blascovich & Tomaka, 1991) indicating that the scale is measuring the intended unidimensional factor proposed by Rosenberg. Additional convergent and discriminant validity data have been reported and reviewed by Byrne, (1984) indicating that the RSE (Rosenberg, 1965) is one of the most valid measures of global self-esteem.

On the basis of these findings the RSE (Rosenberg, 1965) was chosen as a measure of self-esteem, as it appeared to be a reliable and valid instrument that was easy to administer and complete.

2.4.4 Depression

Adolescents with disordered eating also commonly experience symptoms of depression and depressive disorders (Button *et al.* 1996). For this reason a self-report measure of depression was included within the test battery.

The Children's Depression Inventory (CDI; Kovacs, 1985) is a 27 item self-report instrument designed to measure the intensity of current depressive symptomatology within school aged children and adolescents. Each item is rated on three levels (zero – two). A total score is calculated from the sum of the item scores, this can range from 0-54 with higher scores indicating increased levels of depression. This score can then be subdivided into the following subscales; negative mood, interpersonal problems, ineffectiveness, anhedonia (loss of pleasure in previously enjoyable activities) and negative self-esteem.

Coefficient alpha for the scale on a psychiatric sample was $r = 0.86$ indicating good reliability. Within the same sample, the concurrent validity of the CDI (Kovacs, 1985) was determined against two self-rated scales, which quantified related constructs, namely the Revised Children's Manifest Anxiety Scale (Reynolds & Richman, 1978) and the Coopersmith Self-Esteem Inventory (Coopersmith *et al.* 1976). The association between the depression and the anxiety scales was highly significant ($r = 0.65$, $p < .0001$, $n=55$); self-rated depressive symptomatology and low self-esteem were also correlated ($r = -.59$, $p < .0001$, $n=51$).

However, the inventory’s discriminant validity varies in different cohorts. In spite of this it has acceptable test-retest reliability and concurrent validity. The measure is economical to use in terms of time and ease of administration, it also has adolescent norms. For these reasons the CDI (Kovacs, 1985) was chosen as a measure of depressive symptomatology.

2.4.5 Demographic Information

Demographic information on age, ethnic background, information on weight and weight change, information on exercise and information on body image was collected from each participant in the form of a general questionnaire which formed the front page of the questionnaire booklet.

Use of this questionnaire (rather than a selection of standardised inventories that covered the same information), allowed fewer inventories to be given to participants. This was beneficial as it made the questionnaire pack less daunting to complete, hopefully increasing the number of packs returned.

2.4.6 Summary of Measures

Table 1 Summary of Measures Used in the Study

The Exercise Motivation Inventory (EMI II) - Markland and Hardy, (1993)
The Eating Attitude Test (EAT-26) – Garner <i>et al.</i> (1982)
The Rosenberg Self Esteem Scale (RSE) – Rosenberg, (1965)
The Children’s Depression Scale (CDI) – Kovacs, (1985)
Demographic Information Sheet – developed by researcher

2.5 Research Strategy

2.5.1 Pilot Study

In order to ensure that the questionnaire booklet (See Appendix 1) and participant information sheet/consent sheet (See Appendix 2) were appropriate for the target age group, a discussion group was held with girls from Year 11 from School A. During this group the girls were also asked to give opinions on a support sheet that had been designed to accompany the booklet (See Appendix 3).

The girls taking part in the discussion were randomly assigned to the discussion group and given a brief explanation of the task. Each girl was given a copy of the questionnaire booklet, participant information sheet/consent form and support sheet and given time to read through each one. The group was then asked to feedback.

2.5.2 Summary of Feedback from the Group

2.5.2.1 Questionnaire Booklet

The group's comments about the questionnaire booklet were very positive. They commented that the use of examples of how to answer each different questionnaire section within the instructions made the booklet easy to understand. They also liked the fact that the questionnaire booklet was anonymous and suggested that this would make it easier to complete honestly.

The group liked the multiple-choice method of answering the questions commenting that they considered this would make it easier and quicker to complete. They also commented that it was good not to have to write long answers. The group estimated that the questionnaire booklet would take about 20-30 minutes to complete.

In relation to specific questions several suggestions were made. The group suggested that the question relating to weight might be quite difficult to answer, as some girls would not know what their weight was and some girls might not feel comfortable about giving that information.

In response to this, the question was omitted from the original questionnaire booklet and replaced with two different questions.

How happy are you with your current weight? (Please circle answer)

Not at all happy				Very Happy	
0	1	2	3	4	5

Would you like to weigh more or less than you currently do? (Please circle answer)

More	Less
------	------

The group also suggested that the question relating to parental occupation might cause difficulties for some girls. It was considered that it might be quite difficult to answer if your parents were currently unemployed. The group suggested alternatives for asking the question such as “How many people in your family work?”. However it was decided that this type of information was not crucial for the study and the question was omitted completely.

The group commented that the question relating to whom you most wanted to look like was unclear. They suggested that it would be easier to understand if it asked, “What famous popstar/actress would you most like to look like?” After discussions it was decided that the term “idol” was the most appropriate term to use as it encompassed ideas of popstars/actress and other famous people in the public eye. This question was eventually written as: “Which famous idol would you most like to look like?”

In relation to how the questionnaire booklet looked, the group liked the graphics used within each section. The group suggested that printing it on white paper would be better as it would be easier to read black print on white paper rather than black print on blue paper (the pilot questionnaires were printed on blue paper). This suggestion was followed up and all the materials used in the study were printed on white paper.

2.5.2.2 Participant Information Sheet/Consent Form

The group liked the way the information was presented in leaflet form rather than as a letter as this made it more interesting and appealing to read. They also commented that they thought the information presented was easy to understand.

The group suggested they were interested in knowing what the data was being collected for and how it would be used. They also indicated that they would be interested in finding out about the results of the study. Following on from this a brief description of how the information would be used and how results would be fed back to the participants was included within the information sheet.

Several girls within the group commented that they did not know what a clinical psychologist did. Following this a brief description of the role of a clinical psychologist working within a child and adolescent setting was included on the form.

2.5.2.3 Support Sheet

The group felt that the organisations listed were relevant to the research study in terms of the type of difficulties that the questionnaire booklet might provoke. They suggested that website and email addresses were better than postal addresses as they were more likely to use the Internet than write a letter. They also commented that free phone telephone numbers might be useful for participants who could not access the Internet.

The group suggested that rather than handout a support sheet to each participant after questionnaire completion it may be better to have a pile of sheets by the door on the way out. They considered that automatically handing out a support sheet was suggesting that the questionnaire would cause problems when they considered that this would not be a problem for most of the participants.

After further discussions it was decided that it would be easier to hand out a support sheet with the questionnaire booklet as then everybody participating in the study received the same information and no one would be singled out for picking up a support sheet.

2.6 Research Procedure

2.6.1 Ethical Approval

2.6.1.1 University Research Committee

The first step in the ethical approval process was to gain support from the University Research Committee. This involved submitting a research protocol to the committee followed by a brief meeting to discuss the project in more detail. At this meeting permission was given by the committee to apply to the local health authority ethics committee.

2.6.1.2 Health Authority Ethics Committee

Health Authority Ethical approval was obtained from the local NHS Health Authority Ethics Committee (See Appendix 4). As the research did not involve the NHS and involved local schools it was suggested that permission be gained from the relevant Education Departments.

2.6.1.3 Education Department Approval

Permission was gained from the Director of Education to gain permission to contact schools within the region (See Appendix 5).

2.6.2 Summary of Research Strategy

Figure 2 Timeline of Research Strategy

Date	Event
October 2001	♦ Submission to University Research Committee.
December 2001	♦ Submission to Health Authority Ethics Committee.
January 2002	♦ Submission to Education Department.
March 2002	♦ Letter of invitation and research protocol sent to head teachers.
April 2002	♦ Meeting with schools to discuss study in more detail.
May 2002	♦ Pilot study conducted.
June 2002	♦ Amendments to research tools made.
July 2002	♦ Research tools finalised. ♦ Arrangements for data collection finalised.
September 2002	♦ Data collection begins – parental information/consent forms given out. ♦ Approximately one week later participant information/consent form and questionnaires given out.
November 2002	♦ Data collection complete.
March/April 2003	♦ Arrangements made to feedback results to schools/participants.

2.6.3 Ethical Considerations

As the data collected was from school populations it was agreed that all data be kept under secure conditions (Data Protection Act, 1998). It was agreed that any results of the study would be made totally anonymous in all published material.

The procedural design involved parental consent being provided on an opt-out basis. That meant that parents' only returned consent forms if they did not wish their daughter to participate in the study. "Opting out" is a recognised and reliable method of obtaining consent, which several educational researchers have used both nationally and locally (Rigby, 1999).

Evidence suggests that results from studies using this type of consent are less likely to be from a self-selected sample, i.e. bias is reduced. Generalisation from studies using this type of methodology can then be more reliably made to the general population.

When designing this study, the researcher acknowledged that this was a sensitive area of research and might have raised some concerns for schools and individuals that participated. In order to address the issue of raising concerns for participants regarding eating difficulties, within school support was sought from staff.

Teachers and school nurses who worked in these schools agreed to provide support for individuals if required. As previously noted the Education

Department gave consent for the researcher to contact schools regarding this study. The researcher was aware of the DfEE Guidance on Adults in Schools (October 2000) and adhered to its recommendations when in contact with schools.

2.6.4 Obtaining Sample

A letter of explanation and a copy of the research protocol were sent to the Head teachers of six local schools (See Appendix 6). Three head teachers refused to take part and three head teachers agreed to their school taking part in the study. Of the schools that refused, one gave the reason that they had been involved in some research the previous year and whilst this had been a positive experience preferred to opt out at this point. The other two schools chose to decline the invitation giving no reason. In the three schools where head teachers' and the Head of Governors' agreed, a meeting was held between the researcher and the lead contact person from the school to discuss the logistics of the study in more detail.

2.6.5 Data Collection

Parent Information Sheets/Consent Forms were given to parents of those girls eligible to participate in the study one week prior to data collection (Appendix 7). Parents were asked to return the form if they did not want their daughter to participate in the study.

Approximately one week later the researcher returned to the school and administered the questionnaires. Girls whose parents had returned their consent form and had declined to take part in the study were sent to work with a different class (three parents had not consented for their daughter to take part in the study).

All participants eligible to participate in the study were seen as a group in their form room. Participants were then provided with a pack, which included a participant information sheet/ consent form, questionnaire booklet, glossary of definitions and a support sheet. The information leaflet and task instructions were also read out aloud by the researcher.

The participants were then asked to complete the consent form, which was later removed from the questionnaire booklet in order to preserve anonymity. There were no participants at this point who refused to take part in the study. The participants were then asked to complete the questionnaire booklet. They were asked to work individually and not confer with peers during this time.

The questionnaire booklet contained the tests arranged in the following order: Demographic Information, EMI II (Markland & Hardy, 1993), EAT-26 (Garner et al. 1982), RSE (Rosenberg, 1965), and the CDI (Kovacs, 1985).

During questionnaire completion the participants were encouraged to ask for the researcher's assistance if they did not understand any of the terms used. Definitions were provided on more complex concepts such as agile and

invigorating. All participants were provided with the same definitions (See Appendix 8 for glossary).

The questionnaire took roughly 30 minutes to complete and was completed in class time. After the questionnaires were completed and handed back the participants were presented with a support sheet. They were informed these sheets contained contact information for organisations that might be helpful if any of the questions in the booklet had provoked any distress. The participants were informed that teachers and school nurses were available for support if needed.

2.6.6 Feedback of Results

At the time of data collection it was agreed between the researcher and the schools involved that feedback of the results was an important part of the research strategy. It was decided that feedback of the results should take place before the research was completed as this ensured that discussion of the results with schools could be included in the completion of the thesis.

It was also considered important to feedback within the school academic year, so those participants who had been involved in the study could be made aware of results if they wished. For both these purposes it was decided to feedback during March/April.

3. RESULTS

3.1 Overview of Chapter 3

As outlined in Chapter's 1 and 2, this study was interested in whether motivation to exercise for weight control reasons was related to disordered attitudes to eating. This study also aimed to consider the impact of self-esteem and mood on eating and exercise. Three testable research hypotheses were proposed based on previous research findings:

3.1.1 Hypothesis One

See 1.7.4 Exercise & Dieting

It was predicted that motivation to exercise for weight control reasons measured by the EMI II (Markland & Hardy, 1993) would be related to disordered attitudes to eating, measured by EAT-26 (Garner *et al.* 1982).

Adolescent girls who exercise for weight control reasons will be more likely to obtain high scores on the EAT-26, demonstrating higher levels of eating disordered symptoms.

3.1.2 Hypothesis Two

See 1.7.3 Self Esteem, Mood and Dieting

It was predicted that motivation to exercise for weight control reasons measured by EMI II (Markland & Hardy, 1993) would be related to self-esteem, measured by RSE (Rosenberg, 1965).

Adolescent girls who exercise for weight control reasons will be more likely to obtain high scores on the RSE, demonstrating lower self-esteem.

3.1.3 Hypothesis Three

See 1.7.3 Self Esteem, Mood and Dieting

It was predicted that motivation to exercise for weight control reasons measured by EMI II (Markland & Hardy, 1993) would be related to mood, measured by CDI (Kovacs, 1985).

Adolescent girls who exercise for weight control reasons will be more likely to obtain high scores on the CDI, demonstrating lower mood.

3.1.4 Summary

This chapter will begin by presenting an overview of the data and some descriptive statistics. Next, statistical analyses will be reported, these analyses will be detailed following the hypotheses of this study. This section will conclude with a brief summary of findings.

3.2 Descriptive Statistics and Initial Data Analyses

In total, 270 completed questionnaires were collected, 109 (40.4 per cent) participants came from school A, 90 participants (33.3 per cent) came from school B and 71 (26.3 per cent) participants came from school C.

3.2.1 Age of Participants

The mean age of participants who took part in the study was 14.5 years, ranging from 14-16 years. There was a sampling bias towards the lower end of the age range with 97 per cent of the sample aged between 14-15 years and 3 per cent of the sample aged 16 years. The majority of the girls aged between 15-16 years came from schools A and B. In both these schools participants were from Year 11, whereas the majority of girls aged between 14-15 years came from school C. Participants from this school came from Year 10.

One possible explanation for this sampling bias may be that data collection took place at the beginning of the academic year (September-November). Many

participants in Year 10 may not have turned 15 by this point, likewise, many participants in Year 11 may not have turned 16 at this point.

3.2.2 Ethnicity

The majority of girls participating in the study were Caucasian (n=161, 59.6 per cent). The remaining 109 participants described themselves as Asian Bangladeshi (n=3, 1.1 per cent), Asian Indian (n=66, 24.4 per cent), Asian Pakistani (n=8, 3.0 per cent), Asian Other (n=5, 1.9 per cent), Black African (n=10, 3.7 per cent), Black Other (n=3, 1.1 per cent), and Other (n=12, 4.5 per cent).

Two participants (0.7 per cent) failed to complete this section of the questionnaire. Coding for ethnicity was taken from the Trust Wide Ethnicity Form. This measure was felt to be the best match for the geographical area that the data were collected from.

3.2.3 General Questions

Table 2 (page 78) shows results from the general questions asked on the first page of the questionnaire booklet. From Table 2, it is clear that the majority of girls participating in the study wanted to weigh less and exercise more. Just under half of the participants who took part in the study reported exercising to work off food

Table 2 – Information from General Questions (1, 2 and 3).

	More	Less	Missing data
Would you like to weigh more or less than you currently do?	36 (13.3%)	232 (86%)	2 (0.7%)
Would you like to do more or less exercise?	252 (93.3%)	18 (6.7%)	0
	Yes	No	Missing data
Do you ever exercise to work off food that you have eaten?	117 (43.3%)	153 (56.7%)	0

3.2.4 Standardised Questionnaires

Table 3 (page 81) shows the means, standard deviations and range of scores for the four standardised questionnaires used within the study. All scores are rounded up to two decimal places.

3.2.4.1 Exercise Motivation Inventory II (EMI-II; Markland & Hardy, 1993))

From Table 3 (page 81) it is clear that the exercise subscale with the highest mean was physical health motivations for exercise ($M=3.75$), followed by weight control motivations for exercise ($M=3.32$). The exercise subscale with the lowest mean was health pressure motivations for exercise ($M=1.35$), followed by social recognition motivations for exercise ($M=1.60$).

As this scale had not been used with an adolescent population before a reliability coefficient was calculated - Cronbach's alpha. Kline (1993) proposed that that alpha should never be below 0.7. All of the EMI II subscales were used in this reliability test, Cronbach's alpha were equal to 0.9.

3.2.4.2 Eating Attitudes Test -26 (EAT-26; Garner *et al.* 1982))

The mean score on the EAT-26 was $M=12.95$ ($SD = 10.72$) this was within the non clinical range for this test. However, 61, (23 per cent) of participants who took part in the study obtained a clinically significant score (20 or above). This is 10.5 per cent higher than would have been expected on the basis of previous findings. In Button *et al.*'s. (1996) study of adolescent girls aged between 15 and 16, 12.5 per cent obtained a clinically significant score ($M= 9$, $SD = 10$).

3.2.3.3 Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965))

With regard to the RSE the distribution of scores using the Guttman scoring method was very similar to Button *et al.*'s. (1996) study. In this study the mean score was $M=2.7$, $SD = 1.5$ compared to a mean of $M=2.5$, $SD 1.9$ in

Button *et al's.* study (1996). In Button *et al's.* (1996) study 42.6 per cent of participants scored at three or above (Rosenberg's criteria for low self-esteem). In this study almost ten per cent more participants fell into this category (52.2 per cent). Using the scoring system proposed by Blascovich and Tomaka (1991) the mean score on the RSE was $M=23.03$, 106 (39 per cent) participants who took part in the study obtained a score higher than this mean, ranging from 24-40.

3.2.3.4 Children's Depression Inventory (CDI; Kovacs, 1985))

The mean score on the CDI was $M=12.64$, this was within the non clinical range for this test. Thirty-seven per cent of the participants who took part in the study obtained a CDI score of above average (on the 83rd percentile) compared to female adolescent norms. (Kovacs, 1985).

3.2.4 Summary of Results from Standardised Questionnaires

Almost one third of participants who took part in this study scored within the clinical range on tests where there were clinical cut offs (EAT-26, RSE and CDI). Participants' scores on the EAT-26 indicated that 61 (23 per cent) fell within the clinical range. Participants' scores on the RSE indicated that 80 (30 per cent) fell within Rosenberg's range for low self-esteem. Finally, participants' scores on the CDI indicated that 100 (37 per cent) of the sample fell within the clinical range.

Table 3 – Descriptive Data for Standardised Questionnaires

Variable	Minimum	Maximum	Mean (M)	Standard Deviation (SD)	Kolmogorov Smirnov "Z"
EMI II					
Subscales					
Stress Management	0	5	2.15	1.32	1.291
Revitalisation	0	5	2.43	1.19	1.347
Enjoyment	0	5	2.44	1.29	1.081
Challenge	0	5	2.54	1.25	1.373
Social Recognition	0	5	1.60	1.20	1.747*
Affiliation	0	5	1.95	1.29	1.456
Competition	0	5	1.92	1.49	1.991*
Health pressures	0	5	1.35	1.19	2.124*
Ill health avoidance	0	5	3.10	1.29	1.989*
Physical health	0	5	3.75	1.09	2.411*
Weight Control	0	5	3.32	1.47	2.204*
Appearance	0	5	2.74	1.18	1.616
Strength	0	5	3.07	1.12	1.093
Nimbleness	0	5	2.97	1.26	1.251
Total EAT 26 score	0	54	12.95	10.72	2.160*
Total RSE score	10	39	23.03	5.73	1.247
Total CDI score	0	86	12.64	9.19	1.894*

* $p < .01$ and therefore not normally distributed

EMI II- Exercise Motivation Inventory, EAT-26- Eating Attitudes Test, RSE – Rosenberg Self-Esteem Scale, CDI – Children's Depression Inventory.

3.3 Statistical Analyses

3.3.1 Appropriateness of Tests

Data from the study were analysed using the statistical package for the social sciences (SPSS). Initially, the data were analysed to assess the appropriateness of the use of parametric or non-parametric tests. Howell (1989) proposed that for parametric tests to be used, data must be normally distributed, measured on at least an interval scale and possess homogeneous variance. Clark-Carter (1997) proposed the One Sample Kolmogorov- Smirnov Test can be used to assess whether a variable is normally distributed.

The One Sample Kolmogorov- Smirnov “Z” is computed from the largest difference (in absolute value) between the observed theoretical cumulative distribution function. This goodness of fit, tests whether observations could reasonably have come from the specified distribution. Much of the data in this study was not normally distributed. (See Table 3, page 80).

To gain a normal distribution the log of each non-normally distributed variable was obtained through a transformation calculation (Bland, 2000). Subsequent analyses were conducted on both transformed data and non-transformed data. As there were only minor differences between the results, non-transformed results have been reported. Non-transformed results are easier to interpret than transformed data as results are absolute differences rather than ratio differences.

3.3.2 Correlational Analyses

Initially, bivariate correlations were conducted using the whole sample (N=270) to test associations between the EMI II subscales and the total EAT-26 score, total RSE score and total CDI score. Later analysis tested for the association between EMI II subscales and the total EAT-26 score, total RSE score and total CDI score using partial second order correlations to control for the effects confounding variables. A significance effect of $p < .01$ was adopted to decrease the risk of type one errors because a large number of statistical analyses were undertaken. As this study was attempting to test specific hypotheses, one tailed significance values were used.

3.3.2.1 Associations between EMI II subscales and total EAT-26 Score

Analysis (Table 4, page 86) showed the following EMI II subscales were significantly correlated with the total EAT-26 score: stress management, revitalisation, enjoyment, challenge, social recognition, positive health, weight control and appearance. The following subscales were not significantly correlated; affiliation, competition, health pressures, ill health avoidance, strength and nimbleness.

Once the effect of self-esteem (RSE) and mood (CDI) were removed the following correlations remained significant; stress management, enjoyment, challenge, social recognition, competition, weight control, appearance and nimbleness. The partial second order correlations indicated that the initial correlations between stress management, enjoyment, challenge, appearance, social recognition, weight control, appearance and the total EAT-26 score could

not be accounted for in terms of variations in levels of self-esteem or mood (See Table 5, page 87).

The competition and nimbleness subscales were found to be significantly correlated with the total EAT-26 score indicating that level of self-esteem and mood had confounding effects on these subscales.

3.3.2.2 Associations between EMI II subscales and total RSE score

Analysis (Table 4, page 86) showed the following EMI II subscales were significantly correlated with the total RSE score: social recognition, weight control and appearance.

Once the effect of eating distress (EAT-26) and mood (CDI) were removed the following correlations were still shown to be significant; weight control and appearance (see Table 5, page 87). The partial second order correlations indicated that the initial correlations between weight control and appearance and self-esteem could not be accounted for in terms of variations in levels of eating distress or mood.

The competition and nimbleness subscales were found to be significantly correlated with the self-esteem scale score indicating that level of eating distress and mood had confounding effects on these subscales.

3.3.2.3 Associations between EMI II subscales and total CDI score

In analyses (Table 4, page 86) using data from all of the participants, significant correlations were shown between mood and five of the EMI II subscales; stress management, social recognition, health pressures, weight control and appearance.

Once the effects of both eating distress (EAT 26) and self-esteem (RSE) were removed the following correlations were still shown to be significant; health pressures and weight control. The partial second order correlations indicated that the initial correlations between health pressures and weight control and the total CDI score could not be accounted for in terms of variations in levels of eating distress (EAT-26) or self-esteem (RSE). (See Table 5, page 87).

The enjoyment subscale was found to be significantly correlated with the mood score indicating that level of eating distress and self-esteem had confounding effects on this subscale.

Table 4 - Bivariate correlations between EMI II subscale scores and EAT-26 Score, RSE Score and CDI Score

EMI Subscale	Correlation with EAT-26 Score <i>r</i>	Correlation with RSE Score <i>r</i>	Correlation with CDI Score <i>r</i>
Stress Management	.233**	.082	.138*
Revitalisation	.139*	.021	.031
Enjoyment	.109*	-.021	-.032
Challenge	.194**	.031	-.082
Social Recognition	.216**	.168**	.224**
Affiliation	-.014	-.043	.018
Competition	.062	-.094	-.023
Health Pressures	-.002	.031	.101*
Ill Health Avoidance	.019	.037	-.013
Positive Health Reasons	.118*	.070	.051
Weight Control	.519**	.351**	.211**
Appearance	.462**	.379**	.263**
Strength	.018	-.092	-.052
Nimbleness	.063	-.083	.021

**p< .01 level (1-tailed), * p< .05 level (1 tailed).

EMI II- Exercise Motivation Inventory, EAT-26- Eating Attitudes Test, RSE – Rosenberg Self-Esteem Scale, CDI – Children's Depression Inventory.

Table 5 - Partial Correlations between EMI II subscale scores and EAT-26 Score, RSE Score and CDI Score (controlling for confounding variables)

EMI II Subscale	EAT-26 (controlling for RSE/CDI) <i>r</i>	RSE (controlling for EAT-26/CDI) <i>r</i>	CDI (controlling for EAT-26 /RSE) <i>r</i>
Stress Management	.204**	-.049	.048
Revitalisation	.141*	-.042	-.018
Enjoyment	.156**	-.017	-.106*
Challenge	.209**	-.066	-.016
Social Recognition	.139*	.023	.056
Affiliation	.004	-.008	-.003
Competition	.137*	-.133*	-.010
Health Pressures	-.049	-.003	.101*
Ill Health Avoidance	-.002	.042	-.010
Positive Health Reasons	.093	.039	-.043
Weight Control	.428**	.154**	-.141**
Appearance	.340**	.184**	-.083
Strength	0.95	-.074	-.082
Nimbleness	.111*	-.163**	-.062

**p< .01 level (1-tailed), * p< .05 level (1 tailed).

EMI II- Exercise Motivation Inventory, EAT-26- Eating Attitudes Test, RSE – Rosenberg Self-Esteem Scale, CDI – Children's Depression Inventory.

3.3.3 Summary of correlational analyses

Results from correlational analyses demonstrated that associations between subscales of the EMI II and total EAT-26 score existed after effects of both self-esteem and mood had been removed. Several associations existed between the EMI II subscales, RSE and CDI after the effect of confounding variables had been removed. To investigate more fully the combined relationship of these variables, further analyses were undertaken.

3.4 Multiple Regression Analyses

Bruce, Kemp and Snelgar (2000) proposed that Stepwise Multiple Regression is the most sophisticated of regression methods. Within this model each variable is entered in sequence and its value assessed. If adding the variable contributes to the model, then it is retained, but all other variables in the model are then retested to see if they are still contributing to the success of the model. If they no longer contribute significantly they are removed, thus using this method should result in the most parsimonious model.

This study aimed to investigate whether there were any significant relationships between motivation to exercise, level of eating distress, self-esteem and mood. Multiple regression analysis was conducted on the data to determine whether motivation to exercise emerged as a significant predictor of eating distress as measured by the total EAT-26 score. Motivation to exercise subscales, total self-esteem score (RSE) and total mood score (CDI) were chosen as predictor variables.

The criterion variable was the total EAT-26 score.

Using the stepwise method, a significant model emerged: -

Adjusted R Square = .497 (F 5,242 = 49.750 p<0.0005)

Table 6 - Summary of Multiple Regression Analysis for Variables Predicting Total Eat-26 Score (N=270).

Predictor Variable	Beta	T value	Confidence Intervals @ 95%	
			Lower	Upper
Step 1				
Constant	-11.569	-4.807*	-16.309	-6.829
Self-Esteem	1.093	10.839*	0.894	1.292
Step 2				
Constant	-14.993	-6.653*	-19.432	-10.554
Self -Esteem	0.840	8.491*	0.645	1.035
W.Control	2.783	7.021*	2.002	3.564
Step 3				
Constant	-11.585	-5.038*	-16.115	-7.055
Self-Esteem	0.499	4.093*	0.259	0.739
W.Control	2.828	7.404*	2.076	3.581
CDI Score	0.345	4.483*	0.193	0.497
Step 4				
Constant	-9.345	-3.732*	-14.278	-4.413
Self-Esteem	0.488	4.029*	0.250	0.727
W.Control	3.064	7.771*	2.287	3.840
CDI Score	0.314	4.461*	0.190	0.491
Ill Health Avoidance	-.899	-2.174**	-1.713	-.084
Step 5				
Constant	-10.278	-4.134*	-15.176	-5.380
Self-Esteem	0.496	4.160*	0.261	0.732
W.Control	2.929	7.491*	2.158	3.699
CDI Score	0.314	4.149*	0.165	0.464
Ill health avoidance	-1.263	-2.967**	-2.101	-.425
Stress Management	1.233	2.932**	0.405	2.062

**. ** p<.01 * p<.05. Note. R squared = .32 for Step 1; R squared = .43 for Step 2; R Squared = .47 for Step 3; R squared = .48 for Step 4 and R squared = .50 for Step 5.

Table 6 (page 89) demonstrates that the association between the criterion variable (EAT-26) and the predictor variables was moderately strong. The total self-esteem score, weight control subscale score, total mood score, ill health avoidance subscale score and the stress management subscale score accounted for 50 per cent of the variation in the total EAT-26 score.

The standardised regression co-efficients showed that self-esteem was the strongest predictor of the total EAT 26 score, accounting for 32 per cent of the variation. The weight control subscale score accounted for a further 11 per cent of the variation explained by the model, followed by the total mood score accounting for a further four per cent . The ill health avoidance subscale score accounted for a further one per cent followed by the stress management score accounting for another two per cent of the variation explained by the model.

Gruber (1986) proposed that exercise could have an effect on self-esteem and mood. Button *et al.* (1986) found that both self-esteem and mood are also related to the development of eating disorders. To investigate further the effects of exercise on self-esteem and mood two further multiple regression analyses were conducted. The first analysis investigated the association between self-esteem and exercise, the second analysis investigated the association between mood and exercise.

Motivation to exercise, mood (total CDI score) and eating distress (EAT-26) were chosen as the predictor variables. The criterion variable was the self-esteem score (RSE). Table 7 (page 92) shows that the association between the

criterion variable (RSE) and the predictor variables was moderately strong. Together the total CDI score, the total EAT-26 score, the appearance subscale score and the nimbleness subscale score accounted for 53 per cent of the variation in the total RSE score .

The standardised regression co-efficients showed that the total CDI score was the strongest predictor of the total RSE score accounting for 42 per cent of the variation in the score, followed by the total EAT-26 score accounting for a further seven per cent of the variation. The appearance subscale score accounted for a further one per cent of the variation, with the nimbleness subscale score accounting for a further three per cent of the variation explained by the model.

Table 7 (page 92) provides information that quantifies the relationship between the criterion variable (RSE) and the predictor variables. From model four it is possible to predict point increases. Each additional point in the RSE score is associated with 0.313 point increase on the mood scale, 0.118 point increase on the EAT-26 scale, 1.130 point increase on the appearance subscale and -.883 point increase on the nimbleness subscale. The 95 per cent confidence intervals for the regression coefficients indicate where the true values are likely to lie between.

Using the stepwise method, a significant model emerged: -

Adjusted R Square = 0.532 (F=4,243 = 71.33 p<0.0005)

**Table 7 - Summary of Multiple Regression Analysis for Variables
Predicting Total RSE Score (N=270).**

Predictor Variable	Beta	T value	Confidence Intervals @ 95%	
			Lower	Upper
Step 1				
Constant	17.766	35.897**	16.791	18.741
CDI Score	0.427	13.275**	0.364	0.491
Step 2				
Constant	16.863	34.632**	15.904	17.823
CDI Score	0.318	9.021**	0.248	0.387
EAT-26 Score	0.166	5.997**	0.112	0.221
Step 3				
Constant	15.310	21.412**	13.902	16.719
CDI Score	0.317	9.124**	0.248	0.385
EAT-26 Score	0.130	4.349**	0.071	0.189
Appearance	0.744	2.928*	0.244	1.245
Step 4				
Constant	17.096	20.783**	15.475	18.716
CDI Score	0.313	9.282**	0.246	0.379
EAT-26 Score	0.118	4.038**	0.060	0.175
Appearance	1.130	4.273**	0.609	1.650
Nimbleness	-.883	-4.037**	-1.313	-.452

* = p < .05, ** = p < .01. Note. R squared = .42 for Step 1; R squared = .49 for Step 2; R Squared = .50 for Step 3 and R Squared = .53 for Step 4,

Motivation for exercising subscales, the total EAT-26 score and the total RSE score were chosen as predictor variables. The criterion variable was the total CDI score.

Using the stepwise method, a significant model emerged:

R Square = 0.462, ($F=4,243 = 54.082$ $p<0.0005$).

Table 8 - Summary of Multiple Regression Analysis for Variables Predicting Total CDI Score (N=270).

Predictor Variable	Beta	T value	Confidence Intervals @ 95%	
			Lower	Upper
Step 1				
Constant	-10.035	-5.715**	-13.494	-6.577
Self Esteem Score	0.977	13.275**	0.832	1.122
Step 2				
Constant	-8.002	-4.480**	-11.521	-4.484
Self Esteem	0.785	9.021**	0.613	0.956
EAT-26 Score	0.176	3.884**	0.087	0.265
Step 3				
Constant	-6.569	-3.484**	-10.283	-2.855
Self Esteem	0.803	9.266**	0.633	0.974
EAT-26 Score	0.221	4.483**	0.124	0.317
W.Control	-.744	-2.225*	-.1.403	-.085
Step 4				
Constant	-7.104	-3.754**	-10.832	-3.376
Self Esteem	0.797	9.240**	0.627	0.966
EAT-26 Score	0.230	4.682**	0.133	0.327
W.Control	-.862	-2.555**	-1.527	-.197
Health Pressures	-.712	2.020*	0.018	1.407

* = $p < .05$, ** = $p < .01$ Note. R squared = .42 for Step 1; R squared = .45 for Step 2; R Squared = .46 for Step 3 and R Squared = .46 for Step 4.

Table 8 (page 93) shows the association between the criterion variable (CDI) and predictor variable was moderately strong. The standardised regression coefficients show the total RSE score was the strongest predictor of the total CDI score accounting for 42 per cent of the variation explained by the model. The total EAT-26 score accounted for a further three per cent of the variance, followed by the weight control subscale score accounting for a further one per cent. Finally, the health pressures subscale score accounted for a further one per cent of the variance explained by the model.

3.4.1 Summary of Multiple Regression Analyses

The multiple regression analyses have demonstrated that scores on the weight control subscale, stress management subscale and ill health avoidance subscale of the EMI II along with the total RSE score and total CDI score were all found to be predictors of the total EAT-26 score.

Scores on both the appearance and nimbleness subscale of the EMI II, along with the total EAT-26 score and the total CDI score were found to be predictors of the total RSE score. The health pressures subscale score and the weight control subscale score on the EMI along with the total RSE score and the total EAT-26 score were variables were found to be predictors of the total CDI score.

3.5 Relationship of Hypotheses to Results Gained

3.5.1 Hypothesis One

It was predicted that motivation to exercise for weight control reasons measured by the EMI II (Markland & Hardy, 1993) would be related to disordered attitudes to eating measured by EAT-26 (Garner *et al.* 1982).

Adolescent girls who exercise for weight control reasons will be more likely to obtain high scores on the EAT-26, demonstrating higher levels of eating disordered symptoms.

This hypothesis was supported as correlations between EMI II and the total EAT-26 score demonstrated that several of the subscales were correlated with the total EAT-26 score, one of which was weight control. Once the effect of self-esteem and mood was removed the weight control subscale was still found to be correlated with the total EAT-26 score, therefore indicating that the initial correlation could not be accounted for by variations in self-esteem and mood.

Further analysis found weight control to be a predictor variable for the total EAT-26 score, accounting for 11 per cent of the variation explained by the model. Stress management was also found to be a significant predictor, accounting for a further two per cent of the variation explained by the model.

3.5.2 Hypothesis Two

It was predicted that motivation to exercise for weight control reasons measured by EMI II (Markland & Hardy, 1993) would be related to self-esteem measured by RSE (Rosenberg, 1965).

Adolescent girls who exercise for weight control reasons will be more likely to obtain high scores on the RSE, demonstrating lower self-esteem.

Initially this hypothesis was supported as significant correlations were found between the weight control subscale and the total RSE score . Second order correlations that controlled for the effects of eating distress (EAT-26) and mood (CDI) still demonstrated significant correlations between the weight control subscale, the appearance subscale and the self-esteem score. This indicated that this initial relationship could not be accounted for by variations in levels of eating distress or mood.

Further multiple regression analyses found that the weight control subscale score did not account for any of the variance within the self-esteem score. The total CDI score accounted for the most of the variation explained by the model (42 per cent), followed by the total EAT-26 score, which accounted for a further eight per cent of the variation explained by the model. Exercising for appearance related motivation accounted for one per cent of the variance and exercising for nimbleness motivations accounted for three per cent of the variance explained by the model.

3.5.3 Hypothesis Three

It was predicted that motivation to exercise for weight control reasons measured by EMI II (Markland & Hardy, 1993) would be related to mood measured by CDI (Kovacs, 1985).

Adolescent girls who exercise for weight control reasons will be more likely to obtain high scores on the CDI, demonstrating lower mood.

Initially significant correlations were shown between weight control and mood. Analysis that controlled for the effects of EAT-26 and RSE still showed significant correlations. It is therefore concluded that the relationships seen in the initial analysis could not be accounted for by variations in levels of eating distress or self-esteem. Further analysis undertaken demonstrated that the total RSE score was the strongest predictor of the total CDI score, accounting for 42 per cent of the variation explained by the model. The weight control subscale accounted for one per cent of the variation explained by the model.

3.5.4 Summary of Hypotheses

Table 9 – Summary of Hypotheses

Hypothesis	Confirmed /Disconfirmed	Conclusion
Hypothesis One	Confirmed	Adolescent girls who exercise for weight control reasons show high levels of eating disordered symptoms. The weight control subscale was found to be a predictor variable for the total EAT-26 score.
Hypothesis Two	Partially confirmed	Adolescent girls who exercise for weight control reasons have lower self-esteem. The weight control subscale was not found to be a predictor variable for the total RSE score.
Hypothesis Three	Confirmed	Adolescent girls who exercise for weight control reasons have lower mood. The weight control subscale was found to be a predictor variable for the total CDI score.

3.6 Post Hoc Analyses

As reported above, the multiple regression analyses have shown that both the weight control subscale score, stress management subscale score, ill health avoidance subscale score, total self-esteem score and total mood score are predictors of the total EAT-26 score.

On the basis of these findings independent t-tests were conducted on these five variables to see if there were significant differences between those participants who scored below the clinical cut off on the EAT-26 (≤ 20) and those participants who scored above the clinical cut off on the EAT-26 (>20).

Participants in the clinically significant group were more likely to exercise for weight control reasons ($M = 4.54$, $SD = .823$) than participants in the non clinical group ($M = 2.98$, $SD = 1.4$). There was a significant difference between the two groups ($t = 10.838$, $d.f. = 263$, $p = .000$, equal variances not assumed). Participants obtaining scores on the EAT-26 >20 (clinical cut off) were more likely to exercise for weight control reasons than participants obtaining scores ≤ 20 .

Participants in the clinically significant group were more likely to exercise for stress management reasons ($M = 2.57$, $SD = 1.51$) than those participants in the non clinical group ($M = 2.04$, $SD = 1.24$). There was no significant difference between the groups. Participants obtaining scores on the EAT-26 >20 (clinical cut off) were no more likely to exercise for stress management reasons than participants obtaining scores ≤ 20 .

Participants in the clinically significant group were more likely to exercise to avoid ill health ($M=3.05$, $SD=1.41$) than those participants in the non clinical group ($M=3.03$, $SD=1.24$). There was no significant difference between the groups. Participants obtaining scores on the EAT-26 >20 (clinical cut off) were no more likely to exercise for ill health avoidance reasons than participants obtaining scores ≤ 20 .

Participants in the clinically significant group had lower self-esteem (as measured by RSE, higher scores indicating lower self-esteem) ($M=27.22$, $SD=5.70$) than those participants in the non clinical group ($M=21.55$, $SD=4.91$). There was a significant difference between the two groups ($t=8.503$, $d.f.=263$, $p=.000$, equal variances assumed). Participants obtaining scores on the EAT-26 ≥ 20 (clinical cut off) had lower self-esteem than those participants obtaining scores on the EAT-26 <20 .

Participants in the clinically significant group had lower mood (as measured by the CDI, higher scores indicating lower mood) ($M=18.75$, $SD=11.91$) than those participants in the non clinical group ($M=10.61$, $SD=7.08$). There was a significant difference between the two groups ($t=6.704$, $d.f.=263$, $p=.000$) equal variances assumed). Participants obtaining scores on the EAT-26 ≥ 20 (clinical cut off) had lower mood than those participants obtaining score on the EAT-26 <20 .

3.7 Summary of Results

There were several subscale scores from the EMI II that correlated significantly with the total EAT-26 score; exercising for stress management subscale, exercising for revitalisation subscale, exercising for enjoyment subscale, exercising for a challenge subscale, exercising for appearance subscale, exercising for social recognition subscale, exercising for positive health reasons subscale and exercising for weight control subscale.

Further analysis revealed that the stress management subscale, weight control subscale and the ill health avoidance subscale were both significant predictor variables for the total EAT-26 score along with the total self-esteem score and total mood score.

Post hoc analyses also found significant group differences between those participants obtaining scores above the clinical cut off and those participants obtaining scores below the clinical cut off on the EAT-26 on the weight control subscale, self-esteem scale and mood scale. No significant differences were found between groups on the stress management subscale or ill health avoidance subscale

There were several subscales from the EMI II that correlated significantly with the total RSE score, exercising for appearance subscale, exercising for social recognition subscale, and exercising for weight control subscale. Two of these

correlations were significant under partial conditions; exercising for appearance subscale and exercising for weight control subscale.

Multiple regression analysis conducted demonstrated that the mood score was the most significant predictor variable in the self-esteem score. Post hoc analyses also found significant group differences between those participants obtaining scores above the clinical cut off and those participants obtaining scores below the clinical cut off on the EAT-26 on the self-esteem scale.

Whilst initial correlations were significant between the total CDI score and exercising for appearance subscale and exercising for weight control subscale, only the weight control subscale correlation was supported under partial conditions. The weight control subscale was found to be a significant predictor variable in the CDI score, along with self-esteem, eating score and exercising for health pressures subscale.

4. DISCUSSION

4.1 Overview of Chapter 4

To begin this chapter, a brief synopsis of the research findings will be presented. This will be followed by an exploration of these findings, reflecting on previous research literature. The implications for clinical practice will be detailed, with special consideration given to theory development and clinical intervention.

Discussion will focus on the relevance of these findings to primary prevention and the delivery of services at a primary care level. The next section of this chapter will focus on both the strengths and limitations of this study. Issues such as research design, measures and also any practical considerations will be discussed. Recommendations, based on what has been learnt from the present study, will then be outlined to guide the direction of possible future research.

Finally, there will be a section outlining the dissemination of the results of the study. Discussion will focus on the feedback already undertaken to both individual schools and participants. Aims and objectives of any future dissemination of research findings on a wider basis will be discussed. A brief summary of this chapter will be provided, followed by a conclusion section, which will complete this thesis.

4.2 Summary of Research Findings

The purpose of the study was to explore the role of exercise motivation in a female adolescent sample aged between 14 and 16 years. This study aimed to investigate the role of exercise motivation, in particular exercising for weight control reasons and its relationship to attitudes to eating, self-esteem and mood.

Three main research hypotheses were proposed:

4.2.1 Hypothesis One

It was predicted that motivation to exercise for weight control reasons measured by the EMI II (Markland & Hardy, 1993) would be related to disordered attitudes to eating, measured by EAT-26 (Garner *et al.* 1982).

Adolescent girls who exercise for weight control reasons will be more likely to obtain high scores on the EAT-26, demonstrating higher levels of eating disordered symptoms.

As already mentioned in the results (Section 3.5.1) this hypothesis was supported. There was a positive association between exercising for weight control reasons and EAT-26 scores (that is the more likely participants were to exercise for weight control reasons the higher the EAT-26 score).

There was also a positive association between several other EMI II subscales and the EAT-26 score, which were not predicted. The stress management subscale, enjoyment subscale, challenge subscale, social recognition subscale, competition subscale, appearance subscale and the nimbleness subscale were all positively associated with the EAT-26 score, that is, as the likelihood of exercising for these reasons increased so did the EAT-26 score.

Whilst there were several other EMI II subscales that had a positive association with the EAT-26 score only three of these were found to be predictor variables within the multiple regression model. As predicted, the weight control subscale was a significant predictor variable, accounting for 11 per cent of the variance explained by the model. The stress management subscale accounted for a further two per cent of the variance and the ill health avoidance subscale accounted for a further one per cent.

In summary, the weight control subscale, stress management subscale and ill health avoidance subscale were all variables that contributed to the EAT-26 score along with the self-esteem score and the mood score. It is important to note that combined all five variables only accounted for a total of 50 per cent of the variance, a further 50 per cent of the variance was still unaccounted for. The unexplained variance could be accounted for in terms of individual differences such as personality, genetic and family background. There is also a possibility that other risk factors were not measured by the questionnaires, for example, previous mental health history.

4.2.2 Hypothesis Two

It was predicted that motivation to exercise for weight control reasons measured by EMI II would be related to self-esteem, measured by the RSE (Rosenberg, 1965).

Adolescent girls who exercise for weight control reasons will be more likely to obtain high scores on the RSE, demonstrating lower self-esteem.

As already mentioned in the results (Section 3.5.2) this hypothesis was partially supported. There was a significant association between the weight control subscale and the self-esteem score. There were three other EMI II subscales that had a significant association with self-esteem; the appearance subscale, the competition subscale and the nimbleness subscale. That is, as the likelihood of exercising for these reasons increased so did the self-esteem score (the higher the self-esteem score, the lower the self-esteem).

Only two of these subscales emerged as significant predictor variables of the self-esteem score (appearance and nimbleness). Neither the weight control subscale or the competition subscale emerged as significant predictor variables in the multiple regression model. Both the EAT-26 score and the mood score emerged as significant predictor variables. In total these variables accounted for 53 per cent of the variance within the model, leaving 47 per cent of the variance unexplained. Again, factors mentioned in section 4.2.1 may be relevant to explaining the unaccounted for variance.

4.2.3 Hypothesis Three

The third hypothesis in this study was related to mood. It was predicted that motivation to exercise for weight control reasons measured by the EMI II (Markland & Hardy, 1993) would be related to mood, measured by CDI (Kovacs, 1985).

Adolescent girls who exercise for weight control reasons will be more likely to obtain high scores on the CDI, demonstrating lower mood.

As already mentioned in the results (Section 3.5.3) this hypothesis was supported. There was a positive association between weight control reasons for exercise and the mood score. There were only two other EMI II subscales that had a positive association with the mood score, the health pressures subscale and the enjoyment subscale.

Only two of these subscales emerged as significant predictor variables within the multiple regression model, the weight control subscale and the health pressures subscale. Both subscales accounted for one per cent of the variation within the model. Both self-esteem and EAT-26 emerged as significant predictors with the self-esteem score accounting for 42 per cent of the variation and the EAT-26 accounting for three per cent of the variation. In total these variables explained 46 per cent of the variance within the model, leaving 54 per cent of the variance unexplained. Again, factors mentioned in section 4.2.1 may be relevant to explaining the unaccounted for variance.

4.2.4 Post Hoc Analyses

Further post hoc analyses were conducted on the variables that emerged as significant predictors of the EAT-26 score. These analyses focused on group differences comparing those participants with scores equal to and above the clinical cut off score on the EAT-26 with those participants with scores below the clinical cut off score. There were significant differences on the weight control reasons for exercising subscale, the self-esteem score and the mood score. No significant differences were found between groups on either the stress management subscale or the ill health avoidance subscale.

4.3 Interpretation of Research Findings

4.3.1 Scores on standardised questionnaires compared to other studies

Prevalence rates suggest that about three to four per cent of the adolescent female population suffer from eating disorders, with anorexia nervosa and bulimia nervosa being most common. The prevalence of anorexia nervosa among adolescent girls is about one per cent, whilst the prevalence of bulimia nervosa is between one and three per cent (Szmukler & Patton, 1995; American Psychiatric Association, 1993; Bryant-Waugh & Lask, 1995a, 1995b).

Whilst this study did not aim to examine the prevalence rates of eating disorders in a non clinical sample it has generated a considerable amount of data on attitudes to

eating, levels of self-esteem and levels of mood. It is useful to compare the present findings to other studies.

For the purpose of this discussion these findings will be compared to results from Button *et al's* (1996) study, this has been chosen for several reasons. Firstly both studies used the same questionnaires to measure eating distress (EAT-26) and self-esteem (RSE). Both studies also used similar aged participants, Button *et al.* (1996) used participants aged between 15 and 16 years, whilst this study used participants aged between 14 and 16 years. The data from Button *et al's* (1996) study was collected from a different geographical area. Subsequently, no data were available to compare the samples with regard to ethnicity or socio economic status.

Within Button *et al's* (1996) sample, using the EAT-26, 12.5 per cent of participants obtained a score above the clinical cut off, compared to 23 per cent within this study. On the RSE, 42.6 per cent obtained a score of three or above (Rosenberg's criteria for low self-esteem) compared to 52.2 per cent within this study.

The percentage obtaining a score higher than the clinical cut off on the depression component of the scale used was 1.3 per cent, and 32.1 per cent on the anxiety component of the scale used, compared to 37 per cent in this study. The finding from this study are not directly comparable as Button *et al.* (1996) used the HADS (Zigmond & Snaith, 1983) whilst this study used the CDI (Kovacs, 1985).

Other studies have found that many adolescent girls were attempting to lose weight. Serdula *et al.* (1993) reported that 44 per cent of their sample were trying to lose

weight and 26 per cent were trying to prevent weight gain. Coleman and Schofield, (2001) found that 30 per cent of Year Ten girls believed that their weight was too high. In the current study 85.9 per cent of participants wanted to weigh less, a figure higher than previous studies.

Results from the present study suggest that there was a greater degree of pathology on all three clinical measures, also, more participants wanted to lose weight than had been previously suggested. The clinical implications of this increasing pathology and increasing desire for weight loss will be discussed in more detail in the Section 4.4 Clinical Implications.

4.3.2 Exercise and Eating

This study was particularly interested in whether girls who exercise for weight control reasons were likely to show more disordered attitudes to eating. An association between these two variables was demonstrated, weight control reasons for exercising were found to be a significant predictor of the EAT-26 score.

Previous research by Siegel and Hetta (2000) suggested that it is the attitude to exercise rather than the quantity that is more related to eating disordered symptoms in females. The current study furthered this finding by identifying what attitudes/motivation were more likely to increase eating disordered symptoms. The results suggest there are several variables that are likely to increase eating disordered symptoms.

Interestingly, most of the reasons for exercise that were related to an increase in the EAT-26 score were related to elements of physical activity that elicit social reinforcement. For example, exercising for enjoyment reasons, exercising for social recognition reasons and exercising to improve appearance. Values that elicit social reinforcement are particularly important at the time of identity consolidation and are of even greater importance when the predisposed person has a poor pre-existing sense of self (Bruch, 1973).

Bruch (1973) suggested that a female's sense of self is tested when she reaches puberty, which is when she becomes more aware of her appearance and may be more susceptible to eating pathology. It would seem from these findings that motivations to exercise related to social reinforcement were related to an increase in eating pathology.

4.3.3 Exercise and Self Esteem

Findings from this study suggest that there was a relationship between exercising for weight control reasons and self-esteem. That is, as the likelihood of exercising for weight control reasons increased, so the self-esteem score was lower. There was also a similar relationship between the EMI II subscales of appearance, nimbleness and competition.

The relationship between exercising for weight control reasons and self-esteem can be considered in relation to the development of anorexia in adolescent girls. Bruch (1973) proposed that the anorexic child may have difficulties in resolving issues

relating to dependence versus independence because already as a child she has a poor sense of self. The pursuit of thinness provides a solution to her dilemma, enhances her self-esteem, giving her an identity and a sense of control (Bruch, 1973; Crisp, 1980).

Biddle and Mutrie (2001) suggested that physical activity and exercise can lead to enhanced self-esteem. However if physical exercise is directly related to weight control it may well be serving a maladaptive function and lowering self-esteem. This could help explain the low self-esteem and over activity that is often seen in anorexia nervosa.

Weight control reasons for exercising was not a predictor variable within the multiple regression model for self-esteem. So whilst there was an association between exercising for weight control reasons and low self-esteem, it was not possible to predict a direct increase in self-esteem that was related to exercising for weight control reasons.

Hubbard, Gray and Parker (1998) suggested that women who exercise to work off food may be using exercise for the same objective as that which motivates the pathological behaviours of some individuals with eating disorders but perhaps not to the same extent. Following this, it may be that the participants in this study were using exercise in a maladaptive way, which may explain the impact on self-esteem.

4.3.4 Exercise and Mood

Within the literature it has been suggested that exercise generally has the effect of elevating mood (Biddle, Fox, & Boutcher, 2000). Considering this, it has been proposed that physical exercise in general is a healthy way to manage distressed mood (Biddle, Fox & Boutcher, 2000). Findings from this study suggest that exercising for weight control reasons has a negative impact on mood. Possibly, the reason given for exercising may be impacting negatively on mood, and thus the affective symptoms are secondary to the eating disordered pathology.

4.4 Clinical Implications

This research has some potential theoretical and clinical implications that will now be considered.

4.4.1 Theory Development

Within the literature there are several psychological models of exercise adoption and maintenance. These models attempt to explain more about why people adopt exercise and why they may continue or discontinue exercising. Previous exercise research, has attempted to identify an “exercise personality” by examining profiles of athletes based on standard personality profiles (Feltz, 1992). This type of methodology drew few conclusive results. As a consequence of this, research moved towards cognitive and behavioural models to help explain more about exercise adoption and maintenance.

To date, there have been no theoretical models that have attempted to explain the adoption of exercise in adolescence. There have been no models proposed that have attempted to explain maladaptive exercise behaviour. The following section will attempt to develop one particular model; the theory of reasoned action (Ajzen & Fishbein, 1980) taking into account factors relevant to adolescent development and the findings of this study.

The theory of reasoned action (Ajzen & Fishbein, 1980) proposed that people generally do those behaviours that they intend. Following this, a good predictor of whether people will exercise is whether they intend to exercise. The model proposed that intentions are the product of people's attitudes toward a particular behaviour and their perceptions of what is normative regarding that behaviour (subjective norm).

The subjective norm is a product of beliefs about others' opinions and the person's motivation to comply with others' opinions. Attitudes are determined by beliefs about the outcome of the behaviour and the value placed on that outcome.

For example, a sedentary person may believe that other people think they should exercise, and they may wish to do what others want them to. This results in a positive subjective norm for exercising. In addition, they may also believe that they will lose weight and feel less tired if they exercise regularly (outcome beliefs). The combination of this subjective norm and attitudes toward exercise creates a positive intention (See Figure 3 (page 117) Theory of Reasoned Action (Ajzen & Fishbein, 1980)).

This model has particular strengths for explaining behaviour in adolescence as it highlights the importance of what other people think (subjective norm) as well as what the individual believes (outcome belief). Archer (1992) proposed that as a result of the individuation process in adolescence, where the young person develops relative independence from family relationships, peer group affiliation becomes very important. Therefore, within this model the subjective norm could represent the peer group within adolescence.

From the findings of this study and what is known about the development phase of adolescence, it is possible to propose a maladaptive model of exercise. The majority of girls in the study wanted to lose weight and increase their level of exercise: exercising for weight control reasons was a predictor of increased eating distress, suggesting a negative relationship between exercising for weight control beliefs and attitudes to eating.

Figure 4 (page 118) shows an Adolescent Model of Theory of Reasoned Action taking into account some of the factors that are important within the developmental phase of adolescence. Within this model, as the weight loss is achieved the exercise behaviour is reinforced. As the weight loss increases, the awareness of body shape intensifies leading to lower mood and lower self-esteem.

The model shows two key elements that are important to the maladaptive role of exercise. Firstly, the intention to exercise, this can be influenced by genetic factors, past experiences of exercise and personality factors. Secondly, the subjective norm, the model suggests that norms can be influenced by peers, family and cultural

beliefs. Both of these key elements influence the outcome belief, which leads to the behaviour.

The model proposes that to ensure that exercise does not take on a maladaptive role it is important to have healthy and positive intentions and norms regarding exercise. If the intention to exercise and subjective norms are related to weight loss, this may impact on the outcome behaviour in a negative way. With regard to clinical intervention and preventative/educational work these are two potential areas that may be worth targeting.

Figure 3 Theory of Reasoned Action (Ajzen & Fishbein, 1980)

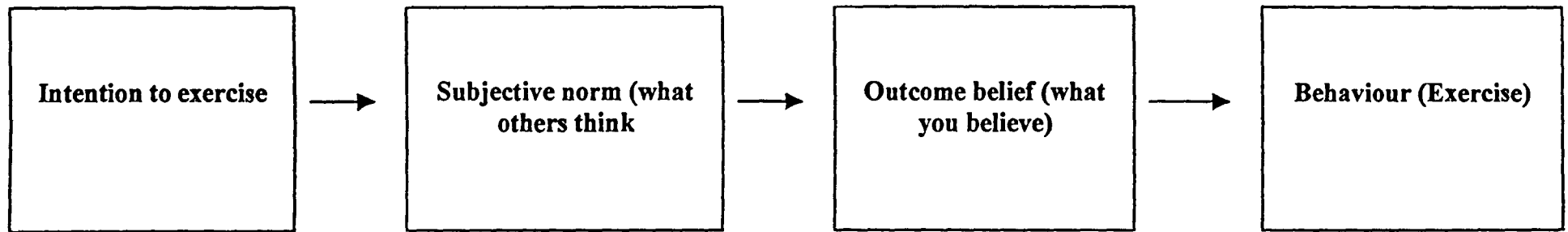
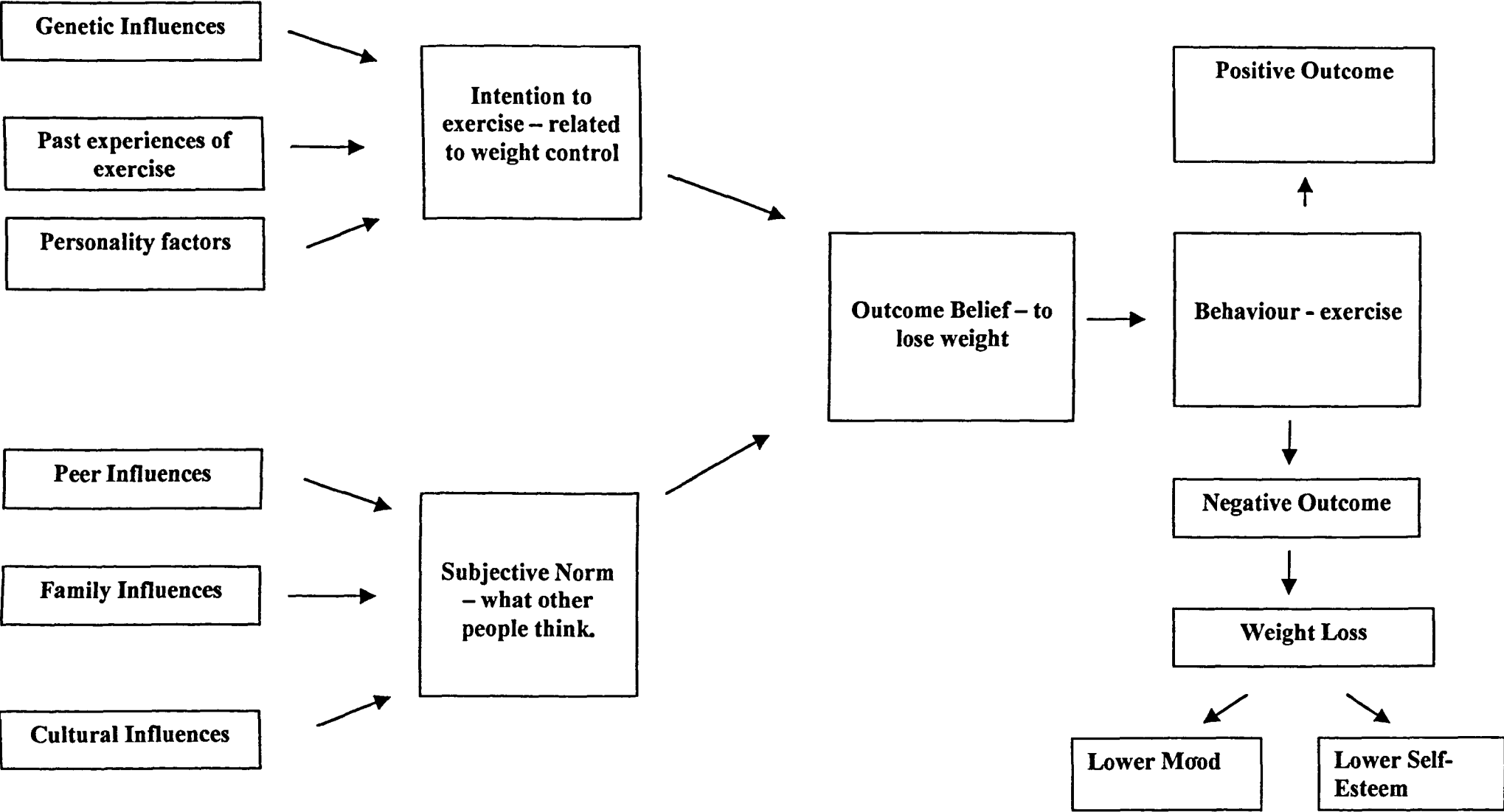


Figure 4 Adolescent Model of Theory of Reasoned Action



4.4.2 Clinical Intervention

Although this study used a non clinical sample, the findings have some interesting implications for intervention and treatment of eating disorders in adolescent girls. As already mentioned findings from this study would suggest that on the clinical measures used; EAT-26, RSE, and the CDI, scores were higher than would be expected on the basis of previous findings (Button *et al.* 1996).

Twenty-three per cent of participants achieved a clinically significant score on the EAT-26 compared with 12.5 per cent in Button *et al's.* 1996 study. On the RSE, 52.2 per cent of participants achieved a score equal to or above the threshold for low self-esteem compared with 42.6 per cent in Button *et al's.* 1996 study. Thirty-seven per cent of participants achieved a clinically significant score on the CDI compared to 1.3 per cent on depression and 32.1per cent on anxiety in Button *et al's.* 1996 study. As already noted the mood measure's used in each study were different so comparisons should be made with caution.

Furthermore post hoc analyses suggest that there were significant group differences with regard to exercise motivations between those participants obtaining scores above the clinical cut off and participants obtaining scores below the clinical cut off on the EAT-26. Participants obtaining scores on the EAT –26 above the clinical cut off were more likely to exercise for weight control reasons, had lower self-esteem scores and lower mood scores.

These figures suggest that there are now higher levels of eating disordered symptomatology, lower levels of self-esteem and lower levels of mood in a non clinical sample of adolescent girls than seven years ago. Although there were similarities between the samples, the data were collected from different geographical areas. Unfortunately no data were available to compare similarities or differences in socio economic status or ethnicity.

Button *et al.* (1996) suggested that data from the study were consistent with a continuing pattern of around 10-15 per cent of girls in this age group developing marked eating disorders (this figure was based on referrals to clinical settings).

Within the locality where this research was conducted, the number of cases presenting to services might be expected to be of the order of 4 or 5 per 100,000 total population per year. Therefore, with a total catchment population approaching 3.5 million, around 150 new referrals per year might be a fair estimate of initial demand for services.

These figures should be interpreted with caution, in the absence of any data; rough figures were derived after discussions with the Clinical Director of the local service (M.Hodgkinson, personal communication, May 2003). Many of the participants within this study may not enter services, thus may not be represented within this data, even though some form of intervention may be helpful for them

Research evidence would suggest that entering into services for treatment is not always effective (Goldner, 1989). Button *et al.* (1997) estimated that approximately

50 per cent of patients undergoing treatment for anorexia nervosa drop out from treatment prematurely. With regard to clinical intervention, it is interesting to think about how this population can be best supported without entering into services.

Research using qualitative methodologies found that issues of control were an important factor with regard to drop out from treatment (Eivors *et al.* 2003). With regard to these findings it would seem that control and the importance of de-pathologising difficulties may well be key in terms of engaging people in effective treatment. Most of the research evaluating the effectiveness of treatment for eating disorders has been conducted on adult populations. The formally defined evidence base with regard to the treatment for adolescents with eating disorders is very small.

Treasure and Schmidt (2002) conducted a systematic review of research. They evaluated three randomised-controlled trials with adolescents in outpatient settings (Eisler *et al.* 2000; Robin *et al.* 1999; Wallin *et al.* 2000) and one in an in-patient setting (Geist *et al.* 2000). They concluded that none of these randomised-controlled trials found an overall significant difference between different psychotherapies in terms of effectiveness of treatment.

Whilst the effectiveness of different treatment programmes is still not clear, the importance of early recognition and appropriate intervention and referral practices in primary care settings is becoming more evident (Cottee-Lane, Pistrang & Bryant-Waugh, 2002). This has been further reflected in the Emerging Findings of the National Service Framework for Children, Young People and Maternity Services

(2003) which has highlighted a commitment to early identification and intervention and also health promotion and prevention.

This document proposes that children's mental health is the responsibility of all agencies and services in contact with children and young people. The document proposes the development of behaviour and educational support teams (BESTs) aiming to provide co-ordinated and integrated services across health, education, social care, youth justice and voluntary sector agencies.

Another model of working at a primary care level is through the implementation of primary mental health workers. The service involved in this study was committed to the establishment of this role throughout the child and adolescent mental health service. The role of these workers was to focus on the development of comprehensive child and adolescent services, especially mental health promotion, early intervention and the support and training of Tier one professionals.

These models of working at a primary care level may help the young person feel in control of their mental health. It may also help avoid referrals to Tier two, three and four services, which subsequently may help avoid the process of diagnosis and labelling, which may not be helpful in terms of treatment.

4.4.3 Health Promotion and Primary Prevention

4.4.3.1 General Health Promotion

Danish (1990) proposed that understanding individual life span development is important in influencing the type of intervention programme that will be most effective. This understanding enables one to have the ability to differentiate normative, dysfunctional and optimal development of a target population. This then helps to discriminate normal from abnormal behaviour (Baltes & Danish, 1980).

Steinberg (1993) divided adolescence into three periods; early (ages 11-14), middle (ages 15-18) and late (ages 18-21). It may be more useful to consider adolescence as a time when the individual is faced with an increasingly complex set of new roles and also needs to reject or modify previously held roles.

Jessor (1982) proposed that adolescent well being could be viewed as encompassing four domains of health; physical, psychological, social and personal. Within each of these domains, adolescents may engage in compromising behaviours. That is: behaviours that threaten the well being of the individual.

Danish (1990) suggested that too much energy is directed towards eliminating health-compromising behaviours whilst health-enhancing behaviours are virtually ignored. In other words, many adolescents would be able to avoid unhappy behaviours if they learn healthy options. Thus the core of many intervention programmes is knowing when to say yes as well as when to say no (Danish 2000).

4.4.3.2 Primary Prevention of Eating Disorders

There have been many studies that have focused on the development of effective prevention programmes for eating disorders. Before these studies are discussed in more detail, a brief overview of prevention theory and its components will be presented.

Prevention theory encompasses several different types of prevention. Primary prevention, sometimes known as universal prevention targets all school aged children or adolescents in general. In a primary prevention programme the target population must be relatively asymptomatic so that the focus is on increasing resilience rather than reducing unhealthy attitudes and behaviours that are already in place if not entrenched (Santonastaso *et al.* 1999).

Selective prevention is aimed at high-risk participants, focusing on changing the attitudes and behaviours of children or adolescents already at risk. Targeted prevention is aimed at children or adolescents already demonstrating symptoms of an illness or disorder and focuses on reducing problematic beliefs and practises that constitute precursors to disordered behaviours (Santonastaso *et al.* 1999).

Smolak *et al.* (2001) proposed that primary prevention (universal prevention) should be the main focus for the prevention of eating disorders. They suggested this could be achieved if broad-based groups of young people, who do not suffer from weight concerns are convinced of the importance of eliminating cultural messages about thinness and fatness.

There have been several studies that have been designed to evaluate the different types of prevention programs available. Some of these studies have yielded negative outcomes. Killen *et al.* (1993) evaluated the effectiveness of a prevention curriculum designed to modify the eating attitudes and unhealthy weight regulation practise of young adolescent girls. Findings suggested that the intervention failed to achieve any significant impact.

Paxton, (1993) evaluated an intervention program to reduce moderate and extreme weight loss behaviours, disordered eating and low body image. Findings suggested that measures of disordered eating and frequency of use of extreme weight loss behaviours were constant over testing occasions and showed no effect of the intervention.

These findings suggest that some educational interventions may not be helpful in the prevention of eating disorders. In some instances, the provision of information about eating disorders may initiate difficulties that previously did not exist. As yet, there is no literature available to support this. However, these findings do question the value of curriculum directed at all adolescents, most of whom are not at risk of developing an eating disorder.

Some preventative interventions have yielded positive results indicative of a true prevention effect in terms of either problem outcome (Santonastaso *et al.* 1999) or important mediators (Neumark-Sztainer *et al.* 2000; O'Dea & Abraham, 2001). Smolak and Levine (2001) found that a curricular programme that used cognitive, social learning, developmental and contextual principles helped prevent the

development of negative body image and unhealthy weight management techniques in girls and boys as they moved from late childhood to early adolescence.

Weissberg *et al.* (1991) suggested, considering the theory of reasoned action (Ajzen & Fishbein, 1980) curricular programmes may have triggered a general increase in the knowledge of eating disorders. However, to challenge subjective norms and the individual's belief regarding what important others may think of them acting against established norms may require long-lasting programmes, addressing strongly held social and cultural values.

From the research literature it would seem that there are many factors that are relevant to the success or failure of prevention programmes. Smolak and Levine (2001) suggested that clearly defining how a program seeks to change problem behaviour immediately and in the long run (selective or targeted prevention) or prevent problem behaviour (universal prevention) is often a key element which determines the success of such interventions.

Other factors such as teacher participation and school commitment are also important. Smolak *et al.* (2001) investigated how best to engage teachers and schools in prevention efforts. Findings suggest that teachers were not interested in full-scale curriculums. Teachers generally reported that they did not have time to incorporate so many new lessons into the many ongoing requirements of their class time.

Teachers reported the need for more information concerning the signs and symptoms of, and risk factors for, eating disorders. They felt this information needed to be quickly available and preferred pamphlets to professional books. Teachers also endorsed the idea of a school resource person. They reported that the presence of a school resource person is a public demonstration of the school's interest in and commitment to the reduction of body image and eating problems among its students.

Teachers also commented on the importance of the support of a school policy. Many commented that a school policy derived from government policy could provide crucial support and guidance. It was generally felt that a school policy was vital in establishing who does what and when this will happen.

Finally, Smolak *et al.* (2001) proposed that if the prevention of eating disorders is going to be truly effective, engaging teachers and educational systems within this is crucial. Educational commitment to prevention efforts is the best method to reach a wide range of children and adolescents. It could potentially provide a real opportunity to make changes in school culture regarding attitudes to eating which could result in a reduction in the incidence of eating problems and disorders.

4.4.4 Summary

This section has provided a description of the clinical implications derived from the findings of this study. An attempt has been made to discuss the findings in relation to theory development; this has involved focusing on the development of one particular model of exercise participation.

Research findings were then discussed in relation to clinical intervention and treatment issues focusing on the importance of normalising elements of psychological distress whilst avoiding pathologising the experience and behaviours. Finally, discussion focused on health promotion and primary prevention in the treatment of eating problems and disorders taking into account the potential drawbacks of this type of approach.

4.5 Strengths of the study

As already described in Chapter 2, a pilot study was undertaken with a group of adolescents to ensure that the information leaflets, consent forms and questionnaires booklets were appropriate for this age group. Several changes were made after the pilot took place to ensure that the research procedure could run as efficiently as possible.

The study used measures with proven reliability and validity. Where reliability coefficients were not available for the age group used in this study, reliability testing was undertaken. Furthermore the number of participants recruited far exceeded the researcher's expectations. This was seen as positive and allowed for robust statistical analysis to be conducted.

Another strength of this study was the timing of the feedback (See Figure 2, Section 2.6.2, page 69, Timeline of Research Procedure). Feedback to schools and participants took place prior to the conclusion of the study. The type of discussion

was relevant to several aspects of this project, namely the clinical implications of the findings and the health promotion and primary prevention aspects of the project.

Finally, this study adds to a developing field of literature concerning exercise and eating disorders. This project targeted the lack of research within this field and aimed to address a significant gap. Findings support those gained by other researchers and also add to the existing work. It is suggested that preliminary results gained from this study could develop research in this area and may have important implications for the treatment and understanding of eating disorders.

4.6 Limitations of the study

4.6.1 Research Design

At the time of designing this research, a between groups' design was originally proposed. This type of design proposed comparing a clinical sample with a non clinical sample to investigate differences regarding motivation to exercise attitudes to eating, self-esteem and mood.

This design was abandoned because of the potential difficulty recruiting participants for the clinical sample. It was considered possible that many adolescent girls suffering from anorexia nervosa may not be well enough to take part in a study of this nature. In light of this potential difficulty it was decided a study focusing on a non clinical population may shed light on how exercise can serve as a risk factor for eating distress in a non clinical population.

4.6.2 Measures

This section will highlight any major limitations of the measures used to obtain the data within this study. Some of these limitations may have been evident prior to questionnaire selection, however some limitations will have become evident during the research process.

4.6.2.1 Exercise Motivation Inventory II (EMI-II; Markland & Hardy, 1993))

The EMI II was chosen as the exercise measure within this study as it reported a good theoretical basis and good discriminate validity. The fact that this measure could be used with participants that were not currently exercising rather than just with those that currently were exercising was viewed as an additional strength.

There were several limitations with this measure that came to light during the research process. With regard to scoring, the EMI II had no overall total motivation score, which consequently meant that it was not possible to measure how motivated an individual was. Instead the EMI II measured the extent to which a respondent was motivated to exercise for various distinct reasons.

A total motivation score may have been helpful in some parts of the statistical analysis, for example, to use as a predictor criterion within the multiple regression analyses. This would have been useful in explaining more about the link between intensity of motivation to exercise and the other variables (e.g. total EAT-26 score, total RSE score and total CDI score), rather than just the link between reasons for exercise and the other variables.

Due to the lack of a total motivation score and the inclusion of 14 separate subscales a large sample size was required to conduct multivariate analysis. Bruce, Kemp and Snelgar (2000) proposed that multiple regression requires a large number of observations.

They suggested that the number of cases (participants) must substantially exceed the number of predictor variables used in the multiple regression. The absolute minimum is five times as many participants as predictor variables. A more acceptable ratio is 10:1, but it can be argued that this ratio should be as high as 40:1 (Clark Carter, 1990).

This study had enough participants to conduct multivariate analyses without violating any assumptions (number of predictor variables = 16, number of participants = 270, ratio = 17:1). However, the number of subscales is quite a serious practical limitation of the instrument. It limits its usefulness in terms of measuring exercise motivation within clinical populations, where the number of participants is going to be relatively small.

As already mentioned in Chapter 2, the EMI II had not previously been used with an adolescent sample. Care was taken to ensure that any language that might not be common to this age group was explained with the use of a glossary of definitions (Appendix 8). There may have been other difficulties due to the nature and age of the participant group.

For example, the EMI II only had two fitness-related subscales; strength and endurance and nimbleness. Whilst these subscales may have been valid for the samples used in the development of the inventory they may not have been valid for an adolescent age group.

Adolescents may have distinguished more finely between different aspects of fitness, particularly those adolescents who exercise for specific reasons or in specialised contexts (e.g. extra curricular physical activity, dance classes or football training). Whilst these limitations may have impacted upon the study, this measure was the only one available at the time of data collection and it was decided at that point that its strengths outweighed its weaknesses.

4.6.2.2 Eating Attitudes Test (EAT-26; Garner *et al.* 1982)

The EAT-26 was chosen, as a measure of eating distress, as it appeared to be a reliable, valid and economical instrument with female adolescent norms (Garner *et al.* 1982). The EAT-26 had been validated with anorexia patients and had also been useful in identifying eating disturbances in non clinical samples (Garner & Garfinkel, 1980; Button & Whitehouse, 1981).

Williams, Hand and Tarnopolsky (1982) proposed that there are sound methodological reasons why screening tests such as the EAT-26 can only be of limited use in detecting eating disorders. They argue that it is the predictive value of an instrument that makes it useful. That is, the probability that a respondent who has an above threshold score on the questionnaire is actually a clinical case.

Garner and Garfinkel (1980) compared EAT-26 scores of a group of anorexic patients and a group of controls. On both occasions sensitivity to eating distress was high leading them to conclude that the EAT-26 was a useful instrument for identifying anorexia nervosa, however they did not calculate predictive values.

The criticism by Williams, Hand and Tarnopolsky (1982) is interesting to the discriminant validity of the EAT-26. However, this study focused more on the sensitivity of the individual to eating distress rather than focusing on the diagnostic nature of the problem.

A more relevant criticism is that from Rolland *et al.* (1997). They proposed that some of the items considered to be indicative of eating pathology may be perfectly normal experiences for some children and adolescents. Rolland *et al.* (1997) also observed that if a participant responds "sometimes" to the statement "I vomit after I eat" this could be interpreted as eating pathology, but it could also plausibly apply to a child who has been sick after an illness.

The phraseology of the test may have different connotations to young people who are unaware of its diagnostic properties. For example, a participant may freely admit to binge eating if they had done this at parties or on trips away from home. The function of this behaviour may be more related to establishing independence than eating pathology and may not be associated with guilt or secrecy.

The optimal test which should be used to measure eating disturbance in British children is one that has been generated from semi-structured interviews with children

with eating disorders, parents and professional, developed for use with boys and girls and standardised on a British population. As yet such a tool has to be developed.

It is important to note that for research studies such as the one described here, a questionnaire format may be useful and relevant. Christie, Watkins and Lask (2000) suggest that for clinical practice the type of information obtained from a questionnaire should be skilfully integrated with other information from parents, siblings and the individual. It is only when all this information has been collated and integrated that a true qualitative picture of the difficulty can be understood.

4.6.2.3 Rosenberg's Self Esteem Scale (RSE; Rosenberg, 1965))

The RSE was chosen, as it appeared to be a reliable and valid method of measuring self-esteem in adolescents. Griffiths *et al.* (1999) found the RSE was a sound tool for measuring self-esteem in eating disordered patients.

In spite of these robust findings the various different methods of scoring the RSE have meant no normative data have been produced to date. In the present study this limitation was overcome by scoring the RSE data in two different ways. The RSE total obtained from the Guttman method of scoring was used as a comparison score with other studies. The RSE total obtained by using the scoring method suggested by Blascovich and Tomaka (1991) was used in the data analysis, as this numerical value was easier to interpret.

4.6.2.4 Children's Depression Inventory (CDI; Kovacs, 1985)

The CDI was chosen, as it appeared to be a reliable and valid method of measuring depression in children and adolescents. The test manual also reports normative data for a sample of 1,266 school children and a clinical sample of 134 children aged between 7 and 16 years (Kovacs, 1992).

Using those data Kovacs (1992) was able to produce cut off scores that could be used to screen for depressive symptoms. Matthey and Petrovski (2002) suggest that the cut off scores should only be calculated by observing the occurrence of depression in one sample. They argue that the 134 children were not part of the original sample of school children and thus the cut off scores may not be reliable.

Within this study, 39 per cent of the sample achieved a CDI score of above average. As this study used the clinical cut-off scores provided by the manual, this observation should be interpreted with caution. The CDI may be better suited to monitoring changes in a child's mood than determining the need for treatment and intervention.

4.6.2.5 Self-Report Questionnaires

All the measures used within this study were self-report questionnaires. This type of questionnaire was adopted in an effort to increase the number of participants that could be recruited in the limited time available. This led to several disadvantages, which will be briefly discussed.

As already previously mentioned a pilot study was undertaken to ensure that the questionnaires were suitable for use by the targeted age group. A glossary of definitions was handed out alongside the questionnaire. Some of the language may not have been fully understood by all of the participants and in some instances this may have impacted on the data.

Another problem common to the use of self-report questionnaires is that some participants may deliberately distort what they report. Vitousek, Daly and Heiser (1991) found that many women seek to maintain their symptomatology, which can lead to the deliberate distortion of self-reports. It is quite possible that this type of effect is also common in adolescent girls. However, Vitousek and Ewald (1993) suggested that research that is separate from clinical contact is more likely to lead to increased accuracy in self-report. As this research was completely separate from clinical contact it may be less problematic.

4.6.3 Practical Considerations

One other criticism of the study was the sheer logistics of conducting research with 100 girls simultaneously. Whilst the research process had included a pilot study to test the appropriateness of language for the participant group there were queries from girls of different ability levels.

In order to provide standardised responses to the questions asked during the data collection period, the researcher asked each participant to raise their hand if they had a question and attended to each participant individually. This was time consuming

and participants often conferred with their classmates before they spoke to the researcher.

It was difficult to ensure that the participants were not helping or copying each other's responses, or not taking the task seriously. If this study were to be replicated, it is recommended that data collection is conducted in smaller more manageable groups or that there are several researchers who have an agreed set of definition words for all possible queries.

Whilst the pilot ensured that potential participants had seen the questionnaire booklet and considered it an appropriate length, the instinctive response of the researcher during the data collection period was that the booklet was too long for the majority of participants.

There were many observable signs that indicated that the levels of attention and concentration deteriorated towards the end of the data collection session. Considering this, it may have been more helpful to use a shorter and more succinct measure of depression that took less time to complete.

Under normal circumstances asking an adolescent to attend to a task for approximately 30 minutes is not extraordinary; however, the researcher did not have the authority of the teacher in ensuring the participants attended to the task. The participants (although in lessons) were under no obligation to complete this booklet and did so out of goodwill.

4.7 Implications for future research

4.7.1 Research using alternative measures

This study has highlighted the importance of motivation and beliefs regarding exercise and how these beliefs can impact negatively on psychological health. In many ways there needs to be much more research focusing on the function of exercise and how this relates to body image and eating problems in children and adolescents.

As already acknowledged within this study, the EMI II lacked any normative data for an adolescent population. Data were available regarding the reliability and validity of the measure, however this was based on data derived from an adult population. As a result of this, the conclusions drawn from this research are tentative. Findings would be more robust if normative data were available.

With regard to this, it would be useful to standardise this tool upon a culturally diverse population of British adolescents and with clinical samples of adolescents with eating disorders. Researchers would then be able to evaluate whether such measures assessing exercise motivation are appropriate for an adolescent population. An alternative to developing normative data for the EMI II, would be to develop more specific child and adolescent focused measures. As already mentioned the EMI II was not designed specifically for use with young people. Some of the subscales incorporated within the measure may not have been relevant to a younger

age group. A measure developed specifically with young people in mind could focus on motivations that may be more relevant to a younger age group.

A specifically designed tool could also measure other themes that were not included in the EMI II. For example, it would be useful to develop a tool, which had the capacity to measure an adolescent's desire to change body shape and lose weight simultaneously. It may also be useful to be able to assess how much importance a young person placed upon losing weight.

Another interesting area to investigate would be to compare the results of the measures used in this study across the three separate schools to see if there were any significant differences between them. This would involve using a between groups design, rather than a correlational design using different statistical tests to the ones used in the current study. It was felt that whilst this would be interesting it was outside the remit of this project as it did not relate directly to the research question and hypotheses.

4.7.2 Research using alternative methodologies

An alternative to developing more robust exercise measures for use with adolescents and children would be to consider researching similar themes using different methodologies. A qualitative research study focusing on the role of exercise in the development of eating disorders may provide a more meaningful insight into the different experiences that people have. This may help elucidate the process and add further to theory development.

It would be interesting to compare the findings of a qualitative study with this quantitative one, as the issues explored here are of a sensitive nature and the method of research used may have impacted upon the findings. Using a qualitative methodology rather than a quantitative one would mean fewer participants would be needed to generate data.

Using this type of methodology, it may be possible to use both a clinical and non clinical sample. This type of design would be useful in generating information from young people who had experience of service provision for eating disorders with young people who had not necessarily experienced any professional input.

With regard to clinical relevance and service developments, it may be useful to have some insight into the experiences of young people coping with eating distress that had not yet come into contact with services. This type of information may be helpful in developing more specific early identification and treatment services.

4.7.3 Preventative Research

As this research has generated valuable information regarding the level of pathology regarding eating distress, self-esteem and mood in a non clinical population, it may be interesting to think about conducting research focusing on prevention of eating disorders and other correlates of psychological distress in a non clinical population of adolescents.

Research of this nature would support governmental policy regarding the provision of mental health services to children and young people. The Emerging Findings of the National Service Framework for Children, Young People and Maternity Services (2003) advocates the prevention of psychological distress in children and young people. This framework follows the principles of the National Service Framework for Mental Health (1999) advocating the idea of early identification and treatment of problems such as psychotic illness and eating disorders.

For preventative research to be effective, issues relating to design and evaluation need to be carefully considered. Many prevention programmes aimed at eating disorders typically use a mixed design. That is, there is one between groups variable (program vs no program) and one within subjects variable (pre to post or pre to follow up).

Research using these type of designs presumes that a prevention effect is demonstrated if the experimental group shows decreases in measurable variables, for example ignorance about fat and body weight or the prevalence of dieting behaviour (Moriarty, Shore & Maxim, 1990).

In most prevention programmes change is measured immediately following completion of the programme. In some studies a long-term follow up has been included to examine whether the desired outcomes (e.g. decrease in the prevalence of dieting) have been maintained over time (Killen *et al.* 1993; Santonastaso *et al.* 1999).

Many prevention programmes designed have sought to demonstrate a universal prevention effect. There are two requirements that need to be met to do this. In the first instance, the population being targeted must be relatively asymptomatic. The focus for prevention is on increasing resilience rather than reducing unhealthy attitudes and behaviours that may already be in place. In the second instance, longitudinal data are required, because demonstration of true prevention effects requires: -

- ◆ the group receiving the program develops problematic eating attitudes and behaviours at a lower rate than those not participating in the program
- ◆ there are significant comparative or absolute changes in the mediating variables

(Franko & Orosan-Weine, 1998; Levine & Smolak, 2001)

Considering the findings of this study a universal prevention programme may not be the most effective for a non clinical population. A universal prevention programme assumes that the target population is relatively asymptomatic, the focus is on increasing resilience. The findings from this study would suggest that almost a quarter of the population were symptomatic, so focusing on increasing resilience would not necessarily be useful for this sub group.

A selective prevention that targets high risk behaviours or a targeted prevention that is aimed at symptomatic participants may be far more suitable. Evidence suggests that for prevention programmes to be truly effective, accurate and adequate

information regarding the target group needs to be readily accessible so the most appropriate programme can be developed (Smolak *et al.* 2001).

4.8 Dissemination of Results

Smolak *et al.* (2001) have suggested that primary prevention programmes should be the centrepiece of eating disorders prevention efforts. They have suggested that schools and colleges should be considered useful sites because they offer an easy way to reach large groups of children and adolescents.

As already described in Chapter 2 (2.3) the data used in this study was collected from participants attending three local secondary schools. It was felt an important part of the research process was to feedback findings to both the staff at the schools involved and also directly to the participants.

This section of the discussion chapter will describe how the information was feedback to participants. This section will also describe in brief how these findings will be disseminated on a wider clinical level.

4.8.1 Dissemination to Schools

After discussions with staff members from each school it was agreed that the schools would benefit from information detailing the key findings of the study, along with descriptive information for their individual school. As a result of these discussions, a report was written for each school. This report detailed the key

findings of the study in relation to the hypotheses proposed (See Appendix 9 for Feedback Report to Schools).

Further information was provided about general descriptive data for each individual school. This report was then sent to the school. Following this, a meeting was arranged between the researcher and the school to discuss in more detail the findings from the study and any implications that this might have for the school. Various different ways of feeding back general findings to participants were also discussed.

4.8.1.1 School A

As already described in Chapter 2, this was a city council maintained single sex comprehensive community school (See Section 2.3.1 for a fuller description). School A was very interested in the findings of the study. Particular concerns were raised regarding the link between exercising for weight control reasons and eating disorder symptomatology.

The member of staff involved in the discussions felt that education regarding eating and exercise was something that was currently missing from the curriculum. It was considered that findings from this study would help support the need for more health-focused education. The member of staff also suggested that some of these findings could be used to support further the school's involvement in the Healthy Schools Initiative.

The Healthy Schools Initiative is part of the Government's intention to help all schools become healthy. The initiative gives schools the opportunity to demonstrate

their commitment to healthier education and promotion and to improve the health status of the whole school community (Our Healthier Nation, 1998).

4.8.1.2 School B

As already described in Chapter 2, this was a city council maintained co-educational community college (See Section 2.3.2 for a fuller description). School B was also interested in the health-related implications of the research. Whilst school B was also committed to the Healthy Schools Initiative, staff members expressed their biggest concern regarding health education was engaging the young people. Due to the social economical status of the area, staff expressed concerns regarding social expectations of many of the young people. They commented that low expectations impacted upon some individuals' motivation to look after themselves physically and psychologically.

As a result of these difficulties school B had been active in developing an "Alternative Pathways" programme which focused more on vocational alternatives rather than traditional higher and further education. It was felt that health promotion could be incorporated into this type of curriculum, as there was less chance of disengagement at this level of learning than at a more academic level.

4.8.1.3 School C

As already described in Chapter 2, this was a county maintained co-educational comprehensive college. (See Section 2.3.3 for a fuller description). School C was also interested in the health-related implications of the research. At the current time no part of the curriculum was designated towards health promotion and education.

Furthermore, staff members expressed concern that due to the academic emphasis within the school, young people may be more susceptible to mental health difficulties such as anxiety, depression and eating difficulties.

School C was considering the introduction of “citizenship tutorials”. It was hoped that these tutorials could incorporate education regarding wider social experiences rather than focusing on academic issues. It was hoped that health education and promotion of mental and physical well being could be incorporated into these sessions.

4.8.2 Dissemination of Results to Participants

After discussions with all the schools involved in the study, it was felt that the findings of the study should be disseminated directly to the participants that took part. Unfortunately due to time constraints related to exam leave it was not possible for the researcher to attend the school to give feedback directly to the participants. Instead a leaflet was designed that incorporated the main findings of the study. This leaflet was disseminated to all participants who took part in the study by staff at each individual school (See Appendix 10 for Feedback Information for Schools).

Staff members from school C also expressed an interest in obtaining more information that could be used as teaching material for the curriculum tutorials. The researcher agreed to be part of a working group involved in the development of psycho education information for young people regarding eating disorders.

4.8.3 Dissemination on a wider level

After completion of the research process, results of this study were disseminated in full to the local Education Department. Finally it was proposed that findings and implications of this research would also be disseminated by way of publication.

4.8.4 Summary of Dissemination

This section has attempted to clarify the dissemination process. As already mentioned health promotion and primary intervention appears to be a crucial resource in the prevention of eating disorders. It was therefore, important to disseminate results to schools and allow them an opportunity to discuss in more detail any implications leading on from this. The dissemination process is not yet complete. It is envisaged that further synopses of the results will be provided to staff on completion of the thesis.

4.9 Summary of Chapter 4

This discussion has attempted to explain the findings of this study in light of existing research literature. Implications of these findings in relation to theory development, clinical intervention and prevention have also been discussed. The strengths and limitations of this research have been detailed. Particular attention has been drawn to how this research could be extended and improved. A brief overview of how these findings have been disseminated has been given with some discussion of the implications for schools and the wider health and education systems.

5. CONCLUSIONS

The present study possesses a number of important strengths as some gaps in the existing research have been addressed. The study has generated information regarding motivation to exercise and attitudes to eating in a non clinical sample of adolescent girls. Information regarding levels of self-esteem and mood has also been generated. Using this data, it has been possible to compare two similar non clinical samples and draw some conclusions about the increasing incidence of eating distress within adolescent girls of a certain age.

The study focused on the use of exercise in adolescent girls and in particular, how different motivations for exercising affected attitudes to eating, levels of self-esteem and mood. Findings suggest there are several variables that are likely to increase disordered attitudes to eating. Most of these variables are related to elements of physical activity that elicit social reinforcement. Thus it would seem that motivations to exercise related to social reinforcement are related to an increase in eating distress.

There was also an association between exercising for weight control and lower self-esteem and lower mood, suggesting that exercising for weight control reasons may be maladaptive and have negative implications for psychological well being. These findings were clinically valuable as they contributed to theory development relating to understanding more about the maladaptive role of exercise in the development of eating disorders.

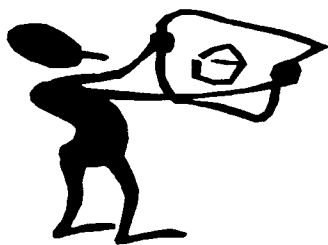
These findings have also generated interesting discussion relating to the development of clinical interventions. Particular attention has been drawn to the development of health promotion and primary prevention programmes for at risk populations within schools and colleges. These discussions are in keeping with the Emerging Findings of the National Service Framework for Children, Young People and Maternity Services (2003) which has highlighted a commitment to early identification and intervention and also health promotion and prevention.

Several ideas for future research have been generated. It is particularly important that future work is directed at investigating further the reliability and validity of these initial findings. This could be done by developing a more appropriate assessment of exercise motivation for adolescents, or by further investigating exercise motivation in a clinical sample using alternative methodologies.

APPENDICES

Appendix 1

Questionnaire Booklet



Exercise and Eating Questionnaire

This questionnaire is **CONFIDENTIAL** and **ANONYMOUS**. This means that no one (other than the researcher, Sophie) will know what you have written, or who you are. Please don't write your name on the questionnaire.



Some of the questions are about the type of exercise that you do, some are about your eating habits and some questions are about how you see yourself and how you feel. When you answer the questions, try thinking of how it has been during the past 2 or 3 months and not only how it is just now.



Try to answer all the questions as honestly as possible. There are no right or wrong answers. But it is important that you answer carefully and how you really feel. Sometimes it is hard to decide what to answer. Then just answer how you think it is.

If you have any questions, raise your hand.





General Information

To begin with I would like to ask you some very general questions. It is very important that you complete all these questions before turning to the next page.

1. Age _____

2. Ethnic Background (please circle)

Asian (Bangladeshi)
Asian (Indian)
Asian (Pakistani)
Asian (Other)

Black (African/Caribbean)
Black (Other)
White
Other

3. Which of the following best describes the way you think of yourself? (please circle)

British
English
Irish
Scottish
Welsh

Indian
Pakistani
Bangladeshi
African Caribbean
Other

4. How happy are you with your current weight? (please circle answer)

Not at all happy

Very happy

0 1 2 3 4 5

5. Would you like to weigh more or less than you currently do? (please circle answer)

More

Less

6. How happy are you with the amount of exercise you do? (please circle answer)

Not at all happy			Very happy		
0	1	2	3	4	5

7. Would you like to do more or less exercise? (please circle answer)

More	Less
------	------

8. Do you ever exercise to work off food you have eaten? (Please circle answer)

Yes	No
-----	----

9. How happy are you with the way your body looks? (Please circle answer)

Not at all happy			Very happy		
0	1	2	3	4	5

10. Which famous idol would you most like to look like?

Now that you have completed this section of the booklet you can turn to the next page and begin the next section.



Reasons for exercising

In this section of the booklet you will find lots of statements concerning the reasons people often give when asked why they exercise.

Read each sentence and indicate by circling the number whether or not each statement is true for you personally if you do exercise or would be true for you personally if you did exercise.

Like this:

I exercise or might exercise to:

	Not at all true for me					Very true for me
Stay slim	0	1	2	3	4	5

Answer the question by circling the number that best describes how you feel about exercising to stay slim.

If you don't think that the statement is ever true for you at all circle the "0".

If you think that the statement is very true for you circle the "5".

If you think that a statement is partly true for you then circle the 1,2,3,4, according to how strongly you feel that it reflects why you exercise or might exercise.

If you mark the wrong number, you can change your answer like this:

Put a large black cross through the number **X** and then circle the number where you want your answer to be.

Remember we want to know why you personally choose to exercise or might choose to exercise, not whether you think the statements are good reasons for anybody to exercise.

Personally, I exercise (or might exercise)...	Not at all true for me					Very true for me
11.To stay slim	0	1	2	3	4	5
12. To avoid ill health	0	1	2	3	4	5
13. Because it makes me feel good	0	1	2	3	4	5
14.To help me look younger	0	1	2	3	4	5
15. To show my worth to others	0	1	2	3	4	5
16. To give me space to think	0	1	2	3	4	5
17. To have a healthy body	0	1	2	3	4	5
18. To build up my strength	0	1	2	3	4	5
19. Because I enjoy the feelings of exerting myself	0	1	2	3	4	5

Personally, I exercise (or might exercise)...	Not at all true for me					Very true for me
20.To spend time with my friends	0	1	2	3	4	5
21. Because my doctor told me to exercise	0	1	2	3	4	5
22.Because I like trying to win in physical activities	0	1	2	3	4	5
23.To stay/become more agile	0	1	2	3	4	5
24.To give me goals to work towards	0	1	2	3	4	5
25.To lose weight	0	1	2	3	4	5
26.To prevent health problems	0	1	2	3	4	5
27.Because I find exercise invigorating	0	1	2	3	4	5
28.To have a good body	0	1	2	3	4	5
29.To compare my abilities with my friends	0	1	2	3	4	5
30.Because it helps reduce tension	0	1	2	3	4	5
31. Because I want to keep healthy	0	1	2	3	4	5

Personally, I exercise (or might exercise)...	Not at all true for me					Very true for me
32.To increase my endurance	0	1	2	3	4	5
33.Because I find exercising satisfying	0	1	2	3	4	5
34.To enjoy the social aspect of exercising	0	1	2	3	4	5
35.To help prevent illness that runs in my family	0	1	2	3	4	5
36.Because I enjoy competing	0	1	2	3	4	5
37.To maintain flexibility	0	1	2	3	4	5
38.To give me personal challenges to face	0	1	2	3	4	5
39.To help control my weight	0	1	2	3	4	5
40.To avoid heart disease	0	1	2	3	4	5
41. To recharge my batteries	0	1	2	3	4	5
42.To improve my appearance	0	1	2	3	4	5
43.To help manage stress	0	1	2	3	4	5

Personally, I exercise (or might exercise)...	Not at all true for me					Very true for me
44.To feel more healthy	0	1	2	3	4	5
45.To get stronger	0	1	2	3	4	5
46.For enjoyment of the experience of exercising	0	1	2	3	4	5
47.To have fun being active with other people	0	1	2	3	4	5
48.To help recover from an illness/injury	0	1	2	3	4	5
49.Because I enjoy physical competition	0	1	2	3	4	5
50.To stay /become flexible	0	1	2	3	4	5
51. To develop personal skills	0	1	2	3	4	5
52.Because exercise helps me to burn calories	0	1	2	3	4	5
53.To look more attractive	0	1	2	3	4	5
54.To accomplish things that others are incapable of	0	1	2	3	4	5

Personally, I exercise (or might exercise)...	Not at all true for me					Very true for me
55.To release tension	0	1	2	3	4	5
56.To develop my muscles	0	1	2	3	4	5
57.Because I feel at my best when I exercise	0	1	2	3	4	5
58.To make new friends	0	1	2	3	4	5
59.Because I find physical activities fun, especially when competition is involved	0	1	2	3	4	5
60.To measure myself against personal standards	0	1	2	3	4	5



Eating and Food

The next section of questions are about how you feel about food and eating. Please tick the box that best refers to the way you feel about each question.

	Always	Usually	Often	Some times	Rarely	Never
61. Am terrified about being overweight.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
62. Avoid eating when I am hungry.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
63. Find myself preoccupied with food.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
64. Have gone on eating binges where I feel I may not be able to stop.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
65. Cut my food into small pieces.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
66. Aware of the calorie content of food.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Always Usually Often Some
times Rarely Never

67. Particularly avoid food with a high carbohydrate content (bread, rice, potatoes, etc.)

--	--	--	--	--	--

68. Feel that others would prefer if I ate more.

--	--	--	--	--	--

69. Vomit after I have eaten.

--	--	--	--	--	--

70. Feel extremely guilty after eating.

--	--	--	--	--	--

71. Am preoccupied with a desire to be thinner.

--	--	--	--	--	--

72. Think about burning up calories when I exercise.

--	--	--	--	--	--

73. Other people think I'm too thin.

--	--	--	--	--	--

74. Am preoccupied with the thought of having fat on my body.

--	--	--	--	--	--

Always	Usually	Often	Some times	Rarely	Never
--------	---------	-------	---------------	--------	-------

75. Take longer than others to eat my meal.

--	--	--	--	--	--

76. Avoid foods with sugar in them.

--	--	--	--	--	--

77. Eat diet foods.

--	--	--	--	--	--

78. Feel that foods control my life.

--	--	--	--	--	--

79. Display self-control around food.

--	--	--	--	--	--

80. Feel that others pressure me to eat.

--	--	--	--	--	--

81. Give too much time and thought to food.

--	--	--	--	--	--

82. Feel uncomfortable about eating sweets.

--	--	--	--	--	--

83. Engage in dieting behaviour.

--	--	--	--	--	--

	Always	Usually	Often	Some times	Rarely	Never
84. Like my stomach to be empty.						
85. Have the impulse to vomit after meals.						
86. Enjoy trying new rich foods.						

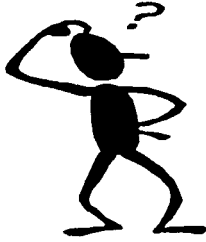


How you see yourself?

The following is a list of ten statements that describe how you feel about yourself. Choose your answer from the four options "Strongly agree", "Agree", "Disagree", or "Strongly Disagree" depending on how you feel about each of the statements. Do not take too long over any one question.

	Strongly Agree	Agree	Disagree	Strongly Disagree
87. On the whole I am satisfied with myself.				
88. At times I think I am no good at all.				
89. I feel that I have a number of good qualities.				
90. I am able to do things as well as most other people.				
91. I feel I do not have much to be proud of.				
92. I certainly feel useless at times.				

	Strongly Agree	Agree	Disagree	Strongly Disagree
93.I feel that I am a person of worth, at least on an equal place with others.				
94.I wish I could have more respect for myself.				
95.All in all, I am inclined to feel that I am a failure.				
96.I take a positive attitude toward myself				



Feelings

Sometimes you may have different feelings and ideas. In the section below there are lots of feelings and ideas in groups. From each group pick one sentence that describes you best for the past two weeks. After you pick a sentence from the first group, go to the next group.

There is no right answer or wrong answer. Just pick the sentence that best describes the way you have been recently. Put a mark X like this next to your answer. Put the mark in the box next to the sentence that you pick.

Here is an example of how this works. Try it. Put a mark next to the sentence that best describes you best.

<input type="checkbox"/>	I read books all the time
<input type="checkbox"/>	I read books once in a while
<input type="checkbox"/>	I never read books

Remember pick out the sentences that describes your feelings and ideas in the past two weeks

97.

<input type="checkbox"/>	I am sad once in a while
<input type="checkbox"/>	I am sad many times
<input type="checkbox"/>	I am sad all the time

98.

<input type="checkbox"/>	Nothing will ever work out for me
<input type="checkbox"/>	I am not sure if things will work out for me
<input type="checkbox"/>	Things will work out for me o.k

99.

 I do most things o.k.
I do many things wrong
I do everything wrong
100.

 I have fun in many things
I have fun in some things
Nothing is fun at all
101.

 I am bad all the time
I am bad many times
I am bad once in a while
102.

 I think about bad things happening to me once in a while
I worry that bad things will happen to me
I am sure that terrible things will happen to me
103.

 I hate myself
I do not like myself
I like myself
104.

 All bad things are my fault
Many bad things are my fault
Bad things are not usually my fault
105.

 I think about harming myself
I think about harming myself but I would not do it
I want to harm myself
106.

 I feel like crying everyday
I feel like crying many days
I feel like crying once in a while

107.

 Things bother me all the time
Things bother me many times
Things bother me once in a while
108.

 I like being with people
I do not like being with people many times
I do not want to be with people at all
109.

 I cannot make up my mind about things
It is hard to make up my mind about things
I make up my mind about things easily
110.

 I look o.k.
There are some bad things about my looks
I look ugly
111.

 I have to push myself all the time to do my school work
I have to push myself many times to do my schoolwork
Doing schoolwork is not a big problem
112.

 I have trouble sleeping every night
I have trouble sleeping many nights
I sleep pretty well
113.

 I am tired once in a while
I am tired many days
I am tired all the time
114.

 Most days I do not feel like eating
Many days I do not feel like eating
I eat pretty well

115. ☐ I do not worry about aches and pains
☐ I worry about aches and pains many times
☐ I worry about aches and pains all the time
116. ☐ I do not feel alone
☐ I feel alone many times
☐ I feel alone all the time
117. ☐ I never have fun at school
☐ I have fun at school once in a while
☐ I have fun at school many times
118. ☐ I have plenty of friends
☐ I have some friends but I wish I had more
☐ I do not have any friends
119. ☐ My school work is alright
☐ My schoolwork is not as good as before
☐ I do very badly in subjects I used to be good in
120. ☐ I can never be as good as other kids
☐ I can be as good as other kids if I want to
☐ I am just as good as other kids
121. ☐ Nobody really loves me
☐ I am not sure if anybody loves me
☐ I am sure that somebody loves me

122.

 I usually do what I am told
I do not do what I am told most times
I never do what I am told
123.

 I get along with people
I get into fights many times
I get into fights all the time

If any of the questions asked in this booklet have caused you any distress or upset you in any way please talk to someone about this.

You can find lots of helpful numbers on the information sheet given out with this questionnaire.

But also remember that teachers, parents and friends are also very good sources of support if you do have any difficulties you would like to talk about.

Thankyou for taking the time to complete these questions.

Appendix 2

EXERCISE & EATING RESEARCH STUDY

INFORMATION FOR PARTICIPANTS & CONSENT FORM

BY

**SOPHIE NESBITT
TRAINEE CLINICAL
PSYCHOLOGIST**

**CENTRE FOR APPLIED
PSYCHOLOGY**

**UNIVERSITY OF
LEICESTER**

Participant Information Sheet/Consent Form

The information provided here may help you decide whether you wish to take part in this study.

If you have any questions I will be available to answer them when the questionnaires are completed.

Important Questions

What is the study for?

The study is looking to explore reasons for exercise and how this relates to attitudes to eating in adolescent girls.

What will be involved if I agree to take part?

You will be asked to complete a questionnaire booklet about exercise and eating.

Some time will be set aside for you to answer these questions. This should take no longer than 30 minutes.

What happens to the information?

All the answers you give will be confidential. You will not be asked to give your name.

What if I find some questions upsetting?

I will be able to give you some information about where to get some support.

What if I change my mind about being involved?

You can let me know at any time if you change your mind about being involved.

Written Consent

To be able to take part I
need to obtain written consent
from you.

If you would like to take part
in the study could you please
complete the form below.

I agree to take part in the above
study

Name:

Signature:

Date:

Thankyou for your time

What is a psychologist?

Psychologists are trained to
understand how people behave, think
and learn. They use this
understanding to help with a wide
range of problems, from difficulties
in learning and developing, to
problems with personal and
social relationships.

What is a clinical psychologist?

Clinical psychologists work from the
perspective of health and community
care. People of all ages can be helped
by clinical psychologists.

Appendix 3

Support Sheet

INFORMATION SOURCES FOR ADOLESCENTS

YOUNG MINDS INFORMATION SERVICE

www.youngminds.org.uk

0800 018 2138

YOUTH 2 YOUTH (National Helpline For Young People)

www.youth2youth.co.uk

PUPILINE (Discussion forum for adolescents)

www.pupiline.net

EATING DISORDERS ASSOCIATION

www.eduak.com

Helpline: 01603 621 414 9am -6.30pm Mon - Fri

Youthline: 01603 765 050 4pm-6.30pm Mon - Fri

BRITISH NUTRITION FOUNDATION,

BNF Information Link

www.nutrition.org.uk

Appendix 4

Health Authority Ethical Approval

DC/SN/1201

21 January 2002

Sophie Nesbitt

Trainee Clinical Psychologist

Dept of Applied Psychology

University of Leicester

LE1 7RH

Dear Sophie

Re: Reasons for exercising and attitudes to eating within adolescent girls.

The above project was submitted for consideration by the I Research Ethics Committee on your behalf, and I have attached a copy of their response. As expected, the Committee did not consider that the project was within their remit to approve. However, they have made a number of useful suggestions about the ethical conduct of the study, which you may wish to consider.

This letter however, serves as confirmation of Trust Approval for the undertaking of the study, and includes confirmation that Trust indemnity will be provided for the study. This approval is conditional upon the Research Office being kept informed of significant developments in the study, adherence to the agreed protocol, and the production of a lay summary of the key findings at the end of the study. It would also be appreciated if any subsequent publications or service innovations developed from the findings are notified to this office.

Congratulations on your success, and if you have any further queries please do not hesitate to get in touch.

Regards,

Miss Sophie Nesbitt
 Trainee Clinical Psychologist
 Department of Applied Psychology – Clinical Section
 Ken Edwards Building University of Leicester
 Leicester LE1 7RH

Dear Miss Nesbitt

**Reasons for exercising and attitudes to eating within adolescent girls –
 our ref no 6560**

Further to your application dated 28 November, I confirm that this was considered by the Research Ethics Committee at its meeting held on the 4 January 2002. As this research does not involve the NHS and involves Schools and you are a University student, this research study is not strictly within our remit.

However, the Committee requested that I offer you the following comments on your application:

1. You include 'date of birth' on the General Information Questionnaire - it was suggested that this should be changed to 'Age' to maintain anonymity of subjects.
2. If the subjects found the study upsetting can they be given information about people who can help them?
3. Parental "opt out" for their daughter in this context is unacceptable. If the girls individually had a chance to opt out and were not exposed to peer pressure so far as recruitment was concerned, then parental "opt out" would be appropriate.
4. What is the purpose of this project? The Committee felt that you should indicate that you are undertaking this research to learn how to do such projects.
5. No 9 on the questionnaire has a typing error.
6. In accordance with the Data Protection Act we would suggest that the schools should distribute details of the study rather than they sending you a list of names for you to send details of the study.
7. You should have letters from the Schools stating that they are happy to take part in this project.

Yours sincerely

Appendix 5
Education Department Approval

1st October 2001

Dear Ms Nesbitt,

RE: Doctorate in Clinical Psychology Research Thesis

Thank you for your letter of 17th August, addressed to , Assistant Director Student & Pupil Support, which has been passed to me for reply. First of all, may I apologise for the delay in replying to you.

After looking through your Research Protocol I feel that your best bet would be to approach individual schools, via Headteachers, and ask for volunteers from the girls. Any school would need to organise parents consent etc and I would expect that some schools would find that engaging in a piece of research like this would be useful and informative, though clearly this is a decision for Headteachers.

I would have thought that a single-sex secondary school in the City might be a good starting point.

I wish you every success with your project.

Yours sincerely,

Appendix 6

Letter of Invitation to Schools

On university headed paper

Dear

Re: Reasons for exercising and attitudes to eating in adolescent girls

I am currently planning a research study investigating why adolescent girls exercise and how this relates to difficulties with eating and food. I am undertaking this study as part of my professional training to be a clinical psychologist.

The study is supervised by....., Consultant Clinical Psychologist, Child and Adolescent Services, and, Lecturer & Clinical Psychologist, Leicester University. I have also obtained approval from the relevant health authorities and City and County Education Departments.

The study has been designed to explore reasons for exercise and how this relates to attitudes to eating in adolescent girls. It will also explore how exercise impacts on both mood and self-esteem. The study will provide beneficial information about what motivates young women to exercise and what function this exercise serves. This will have important implications for health education within schools.

Currently I am trying to identify schools that would be willing to be involved in this study. I am looking to recruit girls aged between 14 – 16 years. The girls will be requested to complete a questionnaire booklet, which will contain four self-report measures, which I will supply.

I am estimating that questionnaire completion will take no longer than 30-45 minutes. All data collected will be confidential, there will be no need for participants to identify themselves on the questionnaire. Furthermore schools taking part in the study will also not be identified.

Ideally I would like to begin collecting this data at the beginning of the new school year in September 2002. I am very aware that schools are very pressurised places, with this in mind I thought it best to follow this letter up with a phone call within the next two weeks to confirm whether your school would like to be involved. At this time I will be very happy to arrange a brief meeting to discuss the research in more detail.

I have enclosed a copy of information leaflets designed for parents and participants regarding the research. These leaflets aims to answer any queries that parents and participants may have. If you agree to being involved in the study I will be willing to discuss more fully with you the information booklet and support information I have designed to accompany the study.

Yours sincerely
Sophie Nesbitt
Trainee Clinical Psychologist

Appendix 7
EXERCISE & EATING
RESEARCH STUDY

INFORMATION FOR
PARENTS & PARENTAL
CONSENT FORM

BY

SOPHIE NESBITT
TRAINEE CLINICAL
PSYCHOLOGIST

CENTRE FOR APPLIED
PSYCHOLOGY

UNIVERSITY OF
LEICESTER
0116 252 2162

Parent Information Sheet

The information provided here
may help you decide whether
you would like your daughter
to take part in this study.

If after reading this information
you have any questions please
contact me on the number on
the front cover of this leaflet.

Important Questions

**What is the purpose
of the study?**

The study is looking to explore
reasons for exercise and how
this relates to eating in
adolescent girls. Findings may
help us understand more about
what motivates young
women to exercise.

**What will be involved if
I agree to my daughter
being involved in the study?**
Your daughter will be asked to
complete a questionnaire booklet
about exercise and eating. This
will take no longer than 30 mins
and be done during school time.

**Will information obtained in
the study be confidential?**
Yes all information will be
completely confidential. I
will be the only person to
see the answers.

**What if my daughter finds
the questionnaires upsetting?**
The questions being asked are
general. I am not expecting girls
to be upset by them. However if
if anyone does get upset I will be
able to provide some information.

What happens if I do not want my daughter to be involved in this study?

You can opt out of the study by completing the form attached and returning to me by the date specified.

Your daughter will not be asked to consent in the study if you have not previously agreed.

If you do not return the attached form I will assume you have no objections to your daughter being involved in the study.

At the time of questionnaire completion I will be asking for your daughter's consent.

If your daughter wishes to opt out at this time she is free to do so.

Opt Out Form

I do NOT wish my daughter to take part in the study described above.

Name:.....

Signature:.....

Name of daughter:.....

Date:.....

Please ensure your daughter returns this form to me at the time of data collection on

.....

Thankyou

Appendix 8

Glossary of Definitions

Some of the words or phrases used in the questionnaire booklet may be new or unfamiliar to you.

Listed below are some examples of words that you may not have heard before.

If there are any other words or phrases that are not on this list that you don't understand please ask me for help.

Chances are if you don't understand the words, lots of your friends won't as well!

"agile" - this means to be able to move quicker and be more athletic

"invigorating" - this means to be quite energised, to have more get up and go!

"endurance" - this means to have stamina, to be able to stick at a task even when it is physically difficult

"recharge my batteries" this expression means to rebuild levels of energy so you can keep going at a certain pace

"personal standards" this expression refers to aims or goals that you might have set yourself in order to achieve certain things

"preoccupation/preoccupied" - this is when a person can't stop thinking about one thing in particular. It is often difficult to pay attention to other things and be distracted because a person may be very focused one thing in particular.

"eating binges" - this is when a person may eat a large amount of food in quite a short space of time, a person may continue to eat even when they don't feel hungry. Sometime he or she may feel unable to stop eating and feel quite out of control of their behaviour.

Appendix 9

Example of Feedback Report for Schools

Nb For confidentiality reasons all data has been anonymised

Reasons for Exercise and Attitudes to

Eating in Adolescent Girls

By

Sophie Nesbitt

Research Summary

Purpose of Report

The purpose of this report is to provide some feedback directly on the data collected from your school. At this stage of the research, the conclusions drawn from the data are only tentative. Dissemination of results and conclusions will follow on from discussion of this paper. These findings will be disseminated in full after June 2003.

Background of Project

Today, exercise appears to be a widespread and increasingly frequent practice. As a consequence, recently, there has been an interest in the link between exercise and the desire to attain or maintain a desirable body weight/shape. Attention has focused on how interest in exercise could lead to the development of an eating disorder.

Studies investigating this have focused on the relationship between involvement in competitive sports (e.g. gymnastics and running) and unhealthy weight control behaviours: e.g. fasting, self-induced vomiting, use of diet pills, laxatives and diuretics.

The extent to which excessive exercise is a risk factor in the development of an eating disorder is still unclear. There has been no

research conducted that explores the role of exercise and its relationship to eating disorders within adolescent girls.

Lots of health and education initiatives suggest that adolescent girls are an important group to focus on when thinking about preventing eating disorders. Further information about the relationship between exercise and eating in adolescent girls could be useful in the development of educational programmes in schools and colleges.

This information could also be helpful in identifying and treating adolescent girls at risk. Many believe that early identification and treatment of these difficulties can lead to a better recovery.

Current Project

This project was a survey study that looked at the relationship between motivation to exercise and attitudes to eating in a group of adolescent girls aged between 14 and 16 years.

The study also looked at the relationship between mood and self-esteem in relation to exercise and eating. Previous work suggests both these factors are important in the development of eating disorders.

This project was hoping to answer three questions

1. It motivation to exercise for weight control reasons related to disordered attitudes to eating?
2. It motivation to exercise for weight control reasons related to self-esteem?
3. It motivation to exercise for weight control reasons related to mood?

Summary of Results

Once the data had been collected it was analysed. From this analysis it was possible to answer the original questions.

1. Is motivation to exercise for weight control reasons related to disordered attitudes to eating?

Preliminary conclusion

From the data collected, it would seem that weight control reasons for exercise were related to attitudes to eating. That means that as the likelihood of exercising for weight control reasons increased so did the level of eating distress.

2. Is motivation to exercise for weight control reasons related to self-esteem?

Preliminary Conclusion

From the data collected, it would seem that weight control reasons for exercising were related to self-esteem. That means that as the likelihood of exercising for weight control reasons increased so did the

self-esteem scores (the higher the self-esteem score, the lower the self-esteem).

3. Is motivation to exercise for weight control reasons related to mood?

Preliminary Conclusion

From the data collected, it would seem that weight control reasons for exercising are related to mood. That means that as the likelihood of exercising for weight control reasons increased so did the mood scores (the higher the mood score, the lower the mood).

Summary of Results for Individual Schools

Demographic Information

In total *** questionnaires were completed by participants. The average age of participants from this school was ** years. The majority of participants were white (**per cent). The remaining participants were either Asian (** per cent), Black (** per cent), or other (** per cent). ** per cent of participants failed to complete this section.

Weight

The majority of girls reported being happy with their current weight, (** per cent). However ** per cent of girls reported being unhappy with their current weight. The majority of girls reported wanting to weigh less (** per cent). With only ** per cent of girls wanted to weight more.

Exercise

The majority of girls were not happy with the amount of exercise they currently did, with ** per cent wanting to do more exercise. Only * per cent of girls wanted to do less exercise. Furthermore ** per cent of girls reported that they exercised to burn off calories.

Motivations for Exercise

The most likely motivation to exercise was for positive health reasons (e.g. to have a good body, to keep healthy and to become more healthy) and for weight control reasons (e.g. to stay slim, to lose weight, to control weight or to burn calories). The most uncommon motivation to exercise was for health problem reasons (e.g. because the doctor has told you to, because of family illness, or to aid recovery from illness).

Other Analyses

The data split was then split into two groups:

- 1) Those girls obtaining a score of above 20 on the Eating Attitudes Test (clinically significant). There were ** girls in this group (** per cent).
- 2) Those girls obtaining a score of equal to or below 20 on the Eating Attitudes Test (not clinically significant). There were ** girls in this group (** per cent).

Analysis of these two group differences showed there were significant differences on several variables;

Exercise Motivation - girls in the clinically significant group were more likely to exercise for social recognition reasons, weight control reasons and appearance reasons.

Self-esteem - girls in the clinically significant group had lower self-esteem.

Mood - girls in the clinically significant group had lower mood.

Conclusions

- ♦ Most girls exercise for positive health reasons and weight control reasons.
- ♦ Girls experiencing higher levels of eating distress however are more likely to exercise for reasons associated with weight control, social recognition and appearance.
- ♦ Girls experiencing higher levels of eating distress are also experiencing lower self-esteem and lower mood than girls not experiencing eating distress.

Discussion Points

- ♦ Is there any other information that may be useful to schools that could be drawn from the data?
- ♦ How can this information be used in promoting positive attitudes to eating and exercise?
- ♦ How can this information be feedback to the participants?
- ♦ How does this information link into current education policies?

18th March 2003

Appendix 10

Feedback Information for Schools

REASONS FOR EXERCISE AND ATTITUDES TO EATING RESEARCH STUDY

FEEDBACK FOR PARTICIPANTS

By
Sophie Nesbitt

Applied Psychology Department
Clinical Section
University of Leicester

Do you remember?

Back in November 2002 I visited your school and asked you to complete a questionnaire booklet.

This booklet had lots of different questions about exercise, food and eating, and how you feel on a daily basis.

What happened to this information?

Once you had finished answering all the questions, I took the information away to have a closer look.

Using all the information that you had given me, I was able to answer several questions. The answers are on the next page.

Questions and Answers

1) Do adolescent girls exercising for weight control reasons worry about eating?

Yes, adolescent girls who exercise for weight control reasons do worry more about eating.

2) Does exercising for weight control improve self-esteem?

No, girls exercising for weight control reasons had lower self-esteem than girls exercising for other reasons.

3) Does exercising for weight control reasons improve mood?

No, exercising for weight control reasons did not make girls feel any happier.

What does all this mean?

Exercising for weight control reasons is not a positive reason for exercising. Girls who were exercising for these reasons felt more concerned about their weight, had lower self-esteem and had lower mood than girls exercising for other reasons.

Other interesting findings?

The most popular reasons for exercising were:-

STRESS MANAGEMENT
TO FEEL REFRESHED
FOR ENJOYMENT
FOR A CHALLENGE

TO MAKE FRIENDS
TO IMPROVE HEALTH
TO IMPROVE APPEARANCE

Most girls who took part in this survey were unhappy with the amount of exercise they did and wanted to do more exercise in the future.

So what now???????

As you are no doubt aware once you have left college there is no more physical education that you have to take part in.

Instead it will be up to YOU to think about building some exercise into your lifestyle now you are no longer at college.

Remember you wanted to do more exercise.

Here are some website addresses that will provide you with more information about healthy eating and the positive effects of exercise

www.exercise.about.com

www.exercise.co.uk

www.foodwatch.com

www.wiredforhealth.co.uk

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