UNIVERSITY OF ALBERTA

AT-RISK ATTITUDES AND BEHAVIOURS FOR EATING DISORDERS AND SPORT INVOLVEMENT OF STUDENTS IN TWO RURAL COMMUNITIES

by

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A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Master of Education

in

Special Education

Department of Educational Psychology

Edmonton, Alberta

Fall 2001

University of Alberta

Library Release Form

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Title of Thesis:	**At-risk attitudes and behaviours for eating disorders and Sport involvement of students in two rural communities.**
Degree:	**Master of Education**
Year this Degree Granted:	**Fall, 2001**

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled **AT-RISK ATTITUDES AND BEHAVIOURS FOR EATING DISORDERS AND SPORT INVOVLEMENT OF STUDENTS FROM TWO RURAL COMMUNITIES** submitted by **REBECCA GOKIERT** in partial fulfillment of the requirements for the degree of **MASTER OF EDUCATION IN SPECIAL EDUCATION.**

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26 Sept 2001

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Abstract

A paucity of research into at-risk attitudes and behaviours associated with eating disorders and sport and leisure involvement prompted this investigation. The first paper involved surveying student's grades 5 to 12 from a rural resort community on attitudes and behaviours surrounding eating disorders and sport involvement. In the second paper the researcher compared a portion of the previous sample with a sample of students grades 5 to 8 from another rural community on level of eating disordered risk as measured by the Risk for Eating Disorders Inventory (REDI). For both communities, older female students were found to be most at-risk for developing an eating disorder. In contrast, younger males were found to have more at-risk scores than older males. Younger children who reported their reason for exercise as being *to have fun* had better body image than older students who reported exercising *to stay fit and healthy* or *to lose weight*.

Acknowledgments

I would like to express my deepest appreciation to those people who contributed generously of themselves to help make possible the completion of this thesis.

Special thanks are due to a wonderful supervisor, Dr. G. Hess for her constant support and competence throughout this project. Your constant encouragement to be efficient and productive will always be greatly appreciated.

I am extremely appreciative of the support I received from Dianne Drummond and Suzanne Hare in utilizing the REDI. I am indebted to the administrators and students who participated in this study. They welcomed me into their schools and made the data collection process a very pleasant one.

Special thanks are due to Dr. M. Gierl for his attention to detail, helpful suggestions and statistical prowess and to Dr. Padfield for her insightful questions and understanding of aspects of my research that I had not considered.

Sincere thanks to my friends who have always backed me up one hundred percent, the support and encouragement is indescribable. Special thanks to Janine Odishaw for the late night phone calls and editorial advice.

To my parents, Mary Lynne and Stephen who have always encouraged and supported me in absolutely everything that I do. I greatly appreciate your extensive guidance, support and congratulatory parties throughout my school career. To my four brothers: Ben, Josh, Simon and Jeff, who have always shown an interest in what I do even if it bores them to death.

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Introduction

The purpose of this master's thesis was to understand the prevalence rates of students' at-risk behaviours for eating disorders in two communities in Western Canada. The author chose to write two papers in a nontraditional thesis manner to contribute to the vastly growing literature in the area of eating disorders. The first paper was prompted by a lack of research into sport and leisure activities as protective factors against the development of an eating disorder. Sport and leisure involvement may act as a buffer from risk factors such as poor self-esteem and negative body image which are associated with eating disorders (Smolak, Murnen & Ruble, 2000). The community in this study was chosen because it is a resort community in the Rocky Mountains that advertises the importance and enjoyment of outdoor sport and leisure activities. This researcher hypothesized higher levels of self-esteem and body image of resident adolescents and younger children as a function of this sport involvement.

A paucity of research into the different eating attitudes and behaviours of students within rural communities, provoked a further investigation comparing the prevalence of at-risk behaviours for students grades 5 through 8 in two rural communities. Within the second paper, gender, grade and location were considered relevant variables when examining the at-risk behaviours for these two communities.

Background

Eating disorders are rising in prevalence among adolescent females (Le Grange, Tibbs & Selibowitz, 1995). Given the emotional and physical outcomes, eating disorders are considered a pressing public health concern. In order to circumvent the progression of these disorders, it is of the utmost importance that prevention and intervention programs

are established and made available prior to the anorexia nervosa or bulimia nervosa stage. According to Phelps, Johnston and Augustyniak (1999), when an eating disorder develops into the anorexia nervosa or bulimia nervosa stage, prevailing treatments have a limited impact on the condition. The disorders are very complex and if not treated early enough, an eating disorder may result in death. These disorders do not yield easily to treatments due to the availability and cost of treatments as well as the nature of the disorders. Eating disorders rank as the third most common chronic illness among adolescent females in the United States (Fisher, Golden, Katzman, Kreipe, Rees, Schebendach, Sigman, Ammerman & Hoberman, 1995). When strict criteria are applied, estimates of anorexia nervosa range from 0.2% to 1.0% among adolescent females and young women. Moderate estimates of bulimia nervosa range from 1% to 3% (Nuemark-Sztainer, 1996). However, the prevalence of bulimic or anorexic-like behaviours such as induced vomiting, dieting or the use of diuretics are considerably higher and said to affect approximately 13% of adolescent females. These statistics are not surprising considering that adolescent girls often view themselves as being overweight and most have attempted dieting at one point in their life (Moreno & Thelen, 1995). Anorexia nervosa occurs ten to twenty times more frequently in females than in males with age of onset in the mid-teenage years. However, it has been documented that up to five percent of anorexia sufferers experience onset of the disorder in their early twenties (Kaplan, Sadock and Grebb, 1994). Despite the proportion of males affected, there appears to be a paucity of published research regarding males with eating disorders (Keel, Klump, Leon & Fulkerson, 1998).

Anorexia nervosa and bulimia nervosa are two eating disorders that have received a great deal of public attention and scientific inquiry. Until recently anorexia nervosa has received a disproportionate focus, placing bulimia in the background. This is changing as bulimia nervosa is now being recognized as a separate, "yet related entity" (Waldman, 1998, p. 52). Anorexia and bulimia nervosa are considered psychological disorders and are found under Axis I – Clinical Disorders, in the Diagnostic and Statistical Manual – Fourth Edition (DSM-IV). Anorexia has been defined according to criteria set forth by the Diagnostic and Statistical Manual – Fourth Edition (DSM-IV, 1994). Anorexia nervosa is described as an unnatural disturbance of body image, in the relentless pursuit of thinness, often to the point of starvation, causing death. This disorder is much more prevalent in females than in males and has its onset in early adolescence. Certain psychological determinants have been postulated regarding the etiology of anorexia nervosa. These include: conflicts surrounding the transition from young girl to woman, a feeling of helplessness and a difficulty in establishing autonomy (Kaplan et al., 1994). In the DSM-IV (1994), a critical indicator of anorexia nervosa involves a refusal to maintain body weight at or above a minimum expected weight or failure to gain an expected amount of weight during a period of growth. Kaplan et al. (1994) state that the anorexia nervosa patient typically has a pervasive fear of becoming overweight, even when considerably underweight. Furthermore, to meet the criteria, a postmenarchal female must have an absence of at least three consecutive menstrual cycles. As specified by the DSM-IV an individual suffering from anorexia nervosa can present with two different types of behaviours. To be diagnosed with the restricting type of anorexia nervosa an individual will not have regularly engaged in binge-eating or purging behaviours (such as

self-induced vomiting or the mistreatment of laxatives, diuretics, or enemas). The binge-eating/purging type of anorexia nervosa requires that an individual repeatedly engage in binge-eating or purging behaviour. (See Appendix A).

Bulimia nervosa, which is more common than anorexia nervosa, is characterized by recurrent episodes of eating large amounts of food accompanied with a feeling of not being in control. During a bingeing session, an individual is said to feel out of control. After the point of satiation, a bulimic individual may engage in compensatory behaviour such as purging (self-induced vomiting, repeated laxative use or diuretic use), fasting or excessive exercise to prevent weight gain (Battle & Brownell, 1996). According to the DSM-IV criteria, the binge-eating and compensatory behaviour must both occur an average of at least twice a week for three months. Two types of bulimia exist and need to be specified as part of the diagnosis of bulimia nervosa. These types are bulimia nervosa of the purging and nonpurging type. An individual diagnosed with the purging type may use self-induced vomiting, laxatives, diuretics or enemas as a compensatory behaviour. An individual diagnosed with the nonpurging type uses other inappropriate redemptory behaviours such as fasting and excessive exercise. Individuals with bulimia tend to evaluate themselves negatively on the basis of body shape and weight. (See Appendix A).

Several researchers have postulated partial syndrome eating disorders as an extension of anorexia nervosa and bulimia nervosa. According to a four year prospective study by Killen et.al, (1996) findings suggested that weight and shape concerns may be the leading causes of partial syndrome eating disorders. A partial syndrome eating disorder, as defined by Killen et al. (1996), must present the following criteria in a three month period: binge eating episodes where the amount of food consumed was above

average or large, followed by engaging in compensatory behaviour specifically to prevent weight gain. These behaviours include vomiting or using laxatives, diuretics, exercise or following strict dietary rules and over concern and preoccupation with body weight and shape and a lack of control of eating during a binge episode. Taylor and Altman (1997) found similar results with regards to partial syndrome eating disorders.

Research into the awareness of the potential risk factors and protective factors for eating disorders has indicated that children of very young ages show signs of at-risk behaviours and attitudes surrounding disordered eating and body image. These at-risk behaviours and attitudes are found to place children and adolescents at increased risk for developing an eating disorder (Shisslak, Crago, McKnight, Estes, Gray & Parnaby, 1998). Leading clinicians and researchers have called for work aimed at the development of eating disorder prevention and intervention programs. However, a limited understanding of the risk factors that may influence the development of eating disorders has impeded growth in this area. Research into the potential risk factors that may be associated with the later development of eating disorders is essential in developing an effective curriculum for prevention and intervention at earlier stages.

The following are risk factors that will be examined in this study, as outlined by Taylor and Altman (1997). Preoccupation with weight, eating attitudes, self-esteem, peer influence and support, dieting and body image are considered personal factors for the development of eating disorders. A considerable number of researchers have focused on the role society and the media play in adolescents' overconcern with body image (King, Touyz & Charles, 2000; Lake, Staiger & Glowinski, 2000; Mautner, Owen & Furnham, 2000; Rabak-Wagener et al., 2000; Stice, Schupak-Neuberg, Shaw & Stein, 1994). In

social learning models it is suggested that preoccupation with weight and shape may serve as important risk factors for the development of eating disorders. Societal norms that link beauty, success and happiness to a thin body shape may produce pressures to maintain a slender physique. This can lead to the development of excessive dieting and other unhealthful weight regulation practices. The sociocultural pressure placed on women to have a thin body may promote internalization of the thin ideal, body dissatisfaction and dietary restraint (Stice, Mazotti, Weibel & Agras, 1999). With the use of adolescent samples, researchers in a number of studies have substantiated that body dissatisfaction is the single strongest predictor of eating disorder symptomatology (Gupta & Johnson, 2000; Miller, Gleaves, Hirsch, Green, Snow & Corbett, 2000; Phelps et al., 1999; Rolland, Farnill & Griffiths, 1997; Schur, Sanders & Steiner, 2000; Wiederman & Prior, 2000).

It has also been hypothesized that there are certain protective factors that may prevent adolescents and young children from developing negative beliefs, attitudes and behaviours associated with eating and exercise. Sport involvement has been offered as a potential protective factor. However, the literature in this area remains unclear. Smolak et al. (2000) conducted a meta-analysis to investigate the relationship between athletic participation and eating problems. Both the protective and risk elements of athletic participation were considered. They found that body dissatisfaction is lower in athletes. They also found that elite athletes, especially in high school, had a reduced risk for eating problems. Sports participation has long been known to be linked with increased levels of self-esteem among boys and men. The literature also suggests that the same relationship holds true for girls and women (Butcher, 1989; Cate & Sugawara, 1986). There appear,

however, to be certain circumstances where athletic involvement could constitute a risk factor. It was suggested by Brownell, Rodin and Wilmore (1992) that certain types of athletic involvement may be harmful to certain types of people due to a number of personality characteristics. The aforementioned authors suggested that sports in which appearance is emphasized may increase the likelihood of an athlete developing eating problems.

The rationale for the current study involved the idea that if prevention or appropriate programming for at-risk youth can circumvent the development of eating disorders, then research into at-risk behaviour is necessary. The researcher hypothesized sport and activity involvement to be an important protective factor for children and adolescents struggling with at-risk attitudes and behaviours. The author chose to conduct the research in a community known for having an abundance of outdoor activities. Due to the easy accessibility and encouragement from peers, parents and teachers, it was expected that young people in this community would engage in more sporting activities and consequently reveal less at-risk attitudes and behaviours for eating disorders. It was predicted by the author, that participation in leisure activity and organized sport, would decrease the amount of concern students experience regarding body image, body dissatisfaction and restrictive practices that are known to be associated with eating disorders. Therefore, the school setting was considered an appropriate venue for examining the different known risk factors, as a cross section of individuals is more readily available.

The author chose to conduct this proposed research in a community in the Rocky Mountains of Canada. The population of Grade 5 to Grade 12 students from the

community were selected to participate in this study. Data was gathered from students in the area who wished to participate and had been given consent by their parents. The community was selected for this study because of two factors. First, the size of the community was manageable; second, there were only two schools in which to conduct research resulting in a potential sample of the population. In choosing this community, it was also the author's intention to study the entire population of students from grades five to twelve.

The purpose of the research project was to examine most of the aforementioned risk factors associated with the development of eating disorders such as self-esteem, body image and dieting. To facilitate the investigation of child and adolescent attitudes and behaviours associated with eating and weight concerns a questionnaire titled: Risk of Eating Disorders Inventory – REDI was used. Students' responses from the questionnaire are classified according to degree of risk (no risk, low risk, moderate risk and high risk) and the eating disorder behaviours they may be engaging in (restricting, purging and bingeing).

This project was also focused on the after school and weekend leisure and sport activities in which the sample of grades five to twelve students participated. In order to investigate the type and duration of exercise and activity in which students participated, the author developed a questionnaire focused on different exercise and sport activities available in the community.

It was hypothesized that gender and age would contribute a great deal to differences found between the REDI and activity questionnaire scores for the students in the Rocky Mountain community. The author was also interested in collecting data from

the students in this community in order to determine their current status with regards to at-risk behaviours for eating disorders and sport and exercise involvement. This information would help to investigate the differences, if any, between the sample of students from the Rocky Mountain community and a sample of students from another community. It was believed that information gained in this study would contribute to a growing body of knowledge involving at-risk behaviours for eating disorders and their relation to levels of sport and leisure activity.

Methods

Overview

The current research project was conducted to explore child and adolescent attitudes and behaviours associated with eating and weight concerns in a small community in the Rocky Mountains. The prevalence rates of at risk behaviours for eating disorders for females and males in grades 5 to 12 were surveyed using a questionnaire titled: Risk of Eating Disorders Inventory – REDI.

A questionnaire was also developed by the researcher to survey the type and duration of exercise and activity that the sample of students in grades 5 to 12 participate in on a regular basis. The questionnaire targets different sports and leisure activities that would be readily available to this sample on a year round basis. Ultimately, the researcher was interested in the attitudes and behaviours associated with eating disorders and levels of sport and leisure activity.

Research Methodology

This research project is considered survey research. The author was interested in obtaining data from members of a population of students from grades 5 to 12 in a small

community in the Rocky Mountains. The data was collected to determine the current status of this community with respect to one or more variables. These variables included the different risk factors associated with the development of an eating disorder and the different levels of sport and leisure activity of students from the research sample. The research was also considered correlational as the author investigated the possible relationship between different variables. The researcher attempted to investigate relationships between different demographic variables and the REDI subscales.

Sample

The sample for this study was chosen based on the location in which the research was to be conducted. The researcher chose to collect data in a small community in the Rocky Mountains. Both the elementary and high school administrations were contacted for permission to collect data within their schools. After they agreed the superintendent of the school district was contacted and a letter was drawn up to allow the researcher to collect data in both of the schools. It was expected that this researcher would provide copies of all informed consent, referral lists and questionnaires for all administrations prior to any data collection proceeding. All parties involved in the study considered it essential that a list of referral agencies within the community and surrounding communities be included with the consent packages. Furthermore, consent from a parent or guardian was necessary in order that a student could participate in the study (See Appendix B). All of the above requirements were met prior to proceeding with the collection of data within the schools. Both administrations requested that the researcher come back to the schools in an appropriate period of time to discuss the research project in full and present the results to the students and staff of both the elementary and

junior/senior high schools. The sample was one of convenience as the entire population of students grades 5 to 12 were handed informed consent packages and the students who returned them were able to participate in the study. Of the 330 informed consent packages sent home with the students, 187 were returned signed by a parent or guardian. A class of 30 grade 12 students was unable to participate in this study as they were completing an examination the day of data collection. Therefore, without random sampling techniques the results of this study may be less generalizable to a larger population. However, the majority of the population of students grades 5 to 12 participated which increases the representativeness of this sample to the population of students within this community.

Participants. From the 330 consent forms sent out, 187 forms were returned signed by a parent or guardian. Of the 187 participants 102 were female and 85 were male. The distribution of students in grades 5-12 was as follows: 9.1% were in grade five, 11.2% were in grade six, 18.2% were in grade seven, 19.8% were in grade eight, 13.4% were in grade nine, 12.3% were in grade ten, 9.6% were in grade eleven and 6.4% were in grade twelve. The age groups were as follows: 4.8% of ten year olds, 12.3% of eleven year olds, 14.4% of twelve year olds, 20.9% of thirteen year olds, 14.4% of fourteen year olds, 12.3% of fifteen year olds, 10.2% of sixteen year olds, 8.0% of seventeen year olds and 2.7% of eighteen year olds. The ethnic background of the students was as follows: 90.4% Canadian, 5.3% Asian exchange students, 1.1% Aboriginal, 1.1% Australian, 1.1% American and .5% French.

Procedure

Two weeks prior to administration of the questionnaires within this study, teachers distributed informed consent packages to parents and students. The packages included a letter to notify parents about the study as well as a list of health professionals in the community and surrounding area (See Appendix B). The researcher's phone number was also provided for the parents and students if they had any questions regarding the study. For concerns regarding eating disorders, parents and students were encouraged to contact any of the referral agencies that deal specifically with eating disorders. There were no calls from parents or guardians with concerns or questions regarding the study. Participation in the following study was voluntary and informed consent was obtained from each subject.

Two days were allotted for data collection within the schools. The senior high students from grades 10-12 and the elementary students from grades 5 and 6 filled out the questionnaires the first day. The junior high school students completed the questionnaire the following day. The researcher was allotted an entire class period of 50 minutes in order to give the students an opportunity to ask questions and fill out the questionnaires without feeling rushed. The majority of the teachers left the classroom during the administration of the questionnaires and students were expected to work on their schoolwork or read quietly when finished so as not to disturb their classmates. It was explained to students that the researcher was collecting information about the different eating and exercise behaviours of students from their community. Certain words found in the REDI that were considered difficult or confusing were defined by the researcher. These words included binge, preoccupied and anxious. Students were encouraged not to

place their names on either questionnaire to ensure that students would answer the questionnaires as honestly as possible. The REDI and activity scales were numbered for data entry purposes. The activity survey for adolescents and students grades 5 and 6 were placed inside of the REDI scale and students were encouraged to fill out the REDI scale first. The activity questionnaire was discussed thoroughly so that students understood what the questions were asking and how they were expected to answer each question. Students were encouraged to raise their hands if they had any questions or confusion with either questionnaire.

Measures

Risk of Eating Disorders Inventory – REDI. The Risk of Eating Disorders Inventory (REDI) was designed to identify evidence of different risk factors seen to be associated with the development of an eating disorder. The process of screening for the early detection of risk factors associated with developing an eating disorder is considered secondary prevention of eating disorders. Coupled with secondary preventive measures the REDI was designed to detect overt symptoms of an eating disorder as they are seen in the DSM-IV (Drummond & Hare, 1999) (See Appendix C).

The REDI was designed to be used by junior and senior high schools to screen large student populations for risk of development of an eating disorder. The questionnaire classifies students with regards to their degree of risk (no risk, low risk, moderate risk and high risk). The inventory also classifies eating disorder behaviour that students may be engaging in (restricting, purging and bingeing). The REDI is composed of eight subtests: self esteem, emotional indicators, maladaptive thoughts, body image, dieting, restricting, purging and bingeing. The degree of risk a student is placed at is evaluated

based on scores on the restricting, purging and bingeing subscales. Scores on the other subscales can be examined to better understand profiles of at-risk students.

The REDI has been validated for grades 5-12. The reading level is grade 4.4; however, students below grade 6 may require that the questions be read to them in order to increase understanding and to ensure an accurate score. The REDI was validated by cross-referencing all test screens against a standardized interview. Also, the information obtained by the REDI and standardized interview were compared to the Eating Attitudes Test 26 (EAT 26), a validated tool for the detection of eating disorders.

The REDI is composed of 50 questions: 25 of the questions are to be answered *false, somewhat true* and *true*. The remaining 25 questions are to be answered by choosing *never, sometimes* or *always*. The 50 questions embody portions of each subscale. The students filling out the questionnaire are asked to rate their level of honesty in filling out the scale. The choices range from one being not honest to a six, which is very honest.

Subscales.

Seven questions were found within the *self-esteem subscale*. These questions address issues such as how happy participants are with themselves and the way they look. Other questions focus on how participants feel about their bodies and how they perceive others to view their size and shape. If an adolescent has a poor self-esteem, he/she is at high risk for developing an eating disorder. High scores on this subscale in combination with high scores on other risk categories, (e.g. dieting behaviour, body image issues or emotional indicators) are thought to place individuals at an even greater risk for eating disorders. The following authors have studied this; Caldwell, Brownell & Wilfley, 1997;

Cate & Sugawara, 1986; Geller, Srikameswaran, Cockell & Zaitsoff, 2000; Mendelson & White, 1996.

The *emotional indicators subscale* is composed of nine questions. These questions deal with such things as depression, anxiety and perceived stress, which are targeted as risks for the development of an eating disorder. Other emotional indicators flagged as risk factors in the development of an eating disorder are shame, high expectations of self and the need to please others. The emotional indicators subscale deals with questions surrounding feelings of powerlessness over one's life, fear of rejection and disappointment with oneself. Emotional indicators as a risk factor are found in the following studies, Byley, Bastiani, Graber & Brooks-Gunn, 2000; Farchaus Stein, 1997; Leon, Fulkerson, Perry & Dube, 1994; Neumark-Sztainer, Story, Hannan, Beuhring & Resnick, 2000.

Five questions surrounding maladaptive thoughts and distorted thinking make up the *maladaptive thoughts subscale*. Examples of maladaptive thought questions are:

> "If I were more muscular and less fat I would have more friends."
> "My life would be better if I could lose some weight."
> "My life would be better if I had less fat and more muscle."
> "I'm afraid to start eating because I think I won't be able to stop."

Some authors that deal with maladaptive thoughts as a risk factor for the later development of an eating disorder include; Devaud, Jeannin, Narring, Ferron & Michaud, 1998; Friedman, Wilfley, Pike, Striegel-Moore & Rodin, 1995; Neumark-Sztainer et al., 2000.

Eight questions on the REDI contribute to the *body image subscale*. Body image involves an individual's perception of appearance and how he/she feels about his/her looks. Body image is affected by many external factors (media, friends, family, abuse,

etc.) and mental and physical health. If individuals do not like what they look like, they may try to change their appearance by unhealthy means. Having a negative body image puts the teen at high risk of developing an eating disorder. The risk rises in combination with other risks (self esteem problems, emotional indicators and/or dieting behaviour) (Brodie, Bagley & Slade, 1994; Cash & Henry, 1995; Gupta & Johnson, 2000).

Dieting behaviour is restricting food intake in order to lose weight. Ten questions were found within the *dieting subscale*. These questions deal with issues surrounding food intake and restriction, as well as excessive dieting and exercise attitudes and behaviours. Dieting behaviour, in combination with any problems with regards to self-esteem, emotional indicators or body image issues indicate an increased risk of developing an eating disorder (Casper & Offer, 1990; Huon & Walton, 2000; Schur et al., 2000).

Restricting, purging and bingeing are all considered eating disorder behaviors. Participating in any eating disorder behaviour puts a teen at high risk of developing an eating disorder. Restricting is severely limiting the food intake (more extreme than dieting). Purging is getting rid of food or calories eaten by means of vomiting, laxatives, diuretics or exercising. Bingeing is eating a very large amount of food in a short period of time. The restricting subscale consists of seven questions, the purging subscale contains six questions and the bingeing subscale contains 6 questions (Crowther & Chernyk, 1986; Fisher et al., 1995; Lyon & Chatoor, 1997; Stice et al., 2000).

Activity Survey- Adolescents and Grades 5 to 6. The researcher developed an activity questionnaire for this research project, as a questionnaire appropriate for this research was not available. Two questionnaires were developed, one for the adolescent

sample (grades 7-12) and one for students in grades 5 and 6. The adolescent questionnaire contained two additional questions regarding part or full time employment. Apart from this the questionnaires for the two groups are identical. The researcher assumed that students from grades 5 and 6 were most likely not employed outside of the home.

The first nine questions of the activity survey are demographic in nature. Such things as gender, age, grade, ethnicity, mother and father's education as well as grades in school were requested. The subsequent 14 questions were designed to focus on the exercise and physical activity level of the participants. Students were given cartoons and a written description of what the researcher considered to be mild, moderate and strenuous exercise. The questionnaire consisted of 12 sport or exercise activities that students from this community might have access to on a yearly basis. If a student participated in a certain activity that was not listed they were encouraged to use the last two questions labeled other to fill in those activities. For each activity students were asked to circle yes for all that apply and no if they did not perform the activity. If students circled yes they were expected to write how many times per week and how long (minutes) they participated in the specific activity. Finally, students were asked to indicate whether their participation in that activity was mild, moderate or difficult.

The remaining five questions dealt with issues such as: why do you exercise, what is the main reason that you exercise, who motivates you to exercise and do you participate in any other activities. The students were also given an area to jot down anything that related to the questionnaires that they had just filled out (See Appendix C).

Data processing and analysis

One hundred and eighty seven students filled out both the REDI questionnaire and the activity questionnaire appropriate to each student (adolescent or grade 5 to 6). Scoring templates were included with the REDI instruction manual, to be used when scoring by hand. The author chose to enter each individuals answer sheet into the SPSS-10 computer program. The author predetermined the variables desired and created a data matrix in which all data from this research project would be organized. Questions that needed to be inversely scored were recoded and added to the data matrix. All of the subscale scores and additional scores were calculated using the SPSS-10 computer program. This method of data processing was chosen to avoid human error when scoring questionnaires manually. It was necessary to place the activity questionnaires directly into the SPSS-10 program, as most of the information was descriptive in nature.

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Eating Disordered Attitudes and Behaviours Related to Sport and Activity in a Rocky Mountain Resort Community

The purpose of this paper was to investigate the at-risk behaviours and attitudes for eating disorders and how sport and leisure activities act as a protective factor against the development of an eating disorder. Participants included 187 male and female students from grades 5 to 12, drawn from a rural community in the Rocky Mountains of Alberta. Data were gathered through two self-report instruments; one tackling questions related to the at-risk behaviours and attitudes associated with eating disorders (Risk For Eating Disorders Inventory-REDI) and the other surveying students' sport and leisure involvement during free time. Results indicated that females within this community are showing significantly greater signs of risk than males on seven of the eight subscales of the REDI. It appears that there is a difference in risk scores for combined grade levels on some of the subscales. Also, the reasons that students exercise is different dependent on gender and grade level; as well, students with poorer body image tend to exercise to lose weight. Findings suggest that further research into rural and urban students' attitudes and behaviours towards exercise and healthy eating is essential.

Eating disorders are rising in prevalence among school aged children in Western cultures. Furthermore, there appears to be a paucity of research into the potential protective factors that may curb an adolescent's risk for developing an eating disorder. In particular, there is limited literature surrounding how sport and leisure activities may play a protective role in an adolescent's life by raising self-esteem and body satisfaction and by improving peer relationships. Within the literature, sport involvement and eating disorders are generally discussed in terms of obligatory exercise and certain elite sport

and athletes risk for eating disorders (Berry & Howe, 2000; Matheson & Mote, 2000; Slay, Hayaki, Napolitano & Brownell, 1998). A lack of consistent findings in these combined areas and the impact that eating disorders is having on younger children, prompted an investigation into the current eating attitudes and behaviours as well as sport and leisure involvement of students grades 5 through 12 from a resort community in the Rocky Mountains of Canada.

An abundance of researchers have focused attention on the at-risk attitudes and behaviours associated with eating disorders for school-aged children. They are attempting to ascertain which children are deemed more at-risk for developing an eating disorder (Le Grange, Tibbs & Selibowitz, 1995; Richards, Casper & Larson, 1990; Taylor, Sharpe, Shisslak, Bryson, Estes, Gray, McKnight, Crago, Kraemer & Killen, 1998). Due to the considerable emotional and physical changes that accompany adolescence, it is considered to be a major risk period for the development of eating disorders. Furthermore, eating disorders are rising in prevalence among younger children. Investigation into the potential risk factors for eating disorders has indicated that along with adolescents, children in elementary school are showing signs of at-risk behaviours and attitudes surrounding disordered eating and body image (Brodie, Bagley & Slade, 1994). Behaviours and attitudes which may place children and adolescents at increased risk for developing an eating disorder include preoccupation with weight, body image, self-esteem, peer influences and dieting (Shisslak, Crago, McKnight, Estes, Gray & Parnaby, 1998; Taylor & Altman, 1997). Leading clinicians and researchers have called for work aimed at the development of eating disorder prevention and intervention programs. However, growth in this area has been impeded by a limited understanding of

the risk and protective factors that increase or decrease youths' risk of developing an eating disorder. Therefore, research into the potential risk and protective factors is essential in developing effective and appropriate curriculum for prevention and intervention programs within the community and school setting.

Risk factor studies tend to be focused on dysfunctional attitudes and behaviours surrounding eating disorders. However, some factors may serve to protect adolescents. It has been postulated that sport and leisure activities, when done in moderation, protect adolescents from developing an eating disorder (Smolak, Murnen & Ruble, 2000). However, there still remains a paucity of exploration into the link between disordered eating attitudes and behaviours in school-aged children and their involvement in sport and leisure activities.

The aim of this study, therefore, was to highlight the prevalence rates of at-risk behaviours and attitudes associated with eating disorders for a pre- and young adolescent sample within a small community in the Rocky Mountains. Another purpose was to investigate the relationship between students' reasons for their sport and leisure involvement and at-risk behaviours. In particular it was of interest to examine the following questions: (1) How do the subscales on the Risk of Eating Disorders Inventory (REDI) correlate to one another? (2) What is the prevalence of eating disordered attitudes and behaviours of the students? (3) Is there a significant difference between gender and grade of students and their scores on the REDI? (4) Is there a significant difference between body image and students reasons for exercising? Will the main reason for exercising be the same across combined grade levels? (5) Is there any relationship between number of activities students participate in and their scores on the REDI? (6)

Does the reason that students exercise differ between younger students and older students? (7) What is the association between self-esteem, body image, exercise behaviour and gender for pre- and young adolescents?

Method

Sample

Participants in this study were 187 elementary, junior and senior high students; aged 10-18, from two schools in a resort community in the Rocky Mountains of Canada. Of the 187 participants, 102 were female. The distribution of students in grades 5-12 are as follows: 9.1% in fifth Grade, 11.2% in sixth Grade, 18.2% in seventh Grade, 19.8% in eighth Grade, 13.4% in ninth Grade, 12.3% in tenth Grade, 9.6% in eleventh Grade and 6.4% in twelfth Grade (See Table 1). An entire class of Grade 12 students was unable to participate in the study as the class was preparing for diploma exams.

Table 1

Frequencies and Percentages of Students Grades 5 to 12 on Variables of Gender, Age, Grade and Ethnicity

Independent Variables	Frequency	Percentage
Gender		
Male	85	45.5
Female	102	54.5
Age		
10	9	4.8
11	23	12.3
12	27	14.4
13	39	20.9
14	27	14.4
15	23	12.3
16	19	10.2
17	15	8.0
18	5	2.7
Grade		
5	17	9.1
6	21	11.2
7	34	18.2
8	37	19.8
9	25	13.4
10	23	12.3
11	18	9.6
12	12	6.4
Ethnicity		
Canadian	169	90.4
Asian Exchange	10	5.3
Aboriginal	2	1.1
Australian	2	1.1
American	2	1.1
French	1	.5
South African	1	.5

The convenience sample for this study was chosen because of the location. The researcher chose to collect data in a small resort community in the Rocky Mountains

because the community is reputed to have many outdoor sport and leisure activities and often attracts residents because of that reputation. It was assumed that the population varies significantly on this variable from other small towns or urban centres in the same province.

Participation in the study was voluntary and informed consent was obtained from each subject's parents or guardians as outlined by the ethical guidelines of the University of Alberta.

Procedure

Two days were allotted for the completion of the questionnaires. The elementary and senior high students completed the questionnaires the first day; the junior high students the second day. Entire class periods of 50 minutes were allotted to allow students to ask questions. Students were instructed not to place their names on the questionnaires to increase confidentiality and honesty of their responses.

Measures

Risk of Eating Disorders Inventory – REDI. The Risk of Eating Disorders Inventory (REDI) was developed to distinguish risk factors seen to be associated with the development of an eating disorder. These risk factors form the eight subscales of the REDI and include self-esteem, emotional indicators, maladaptive thoughts, body image, dieting, restricting, purging and bingeing. The REDI may aid in the detection of overt symptoms of an eating disorder as they are classified in the Diagnostic and Statistical Manual- Fourth Edition (1994). The REDI is composed of 50 questions, which contribute to the eight subscales. An individual's level of honesty is interpreted using a Likert scale; one being not honest to a six, which is very honest. A student's level of risk is determined

by the manner in which they answer the REDI questionnaire (no risk, low risk, moderate risk and high risk). The inventory also distinguishes specific eating disorder behaviour in which students may be participating: restricting, purging and bingeing (Drummond & Hare, 1999). The REDI was used in this study to screen a large student population of males and females, grades five through twelve. Reliability measures were calculated for each of the eight subscales of the REDI (See Table 2).

Table 2

Cronbach's Alpha Reliability Measures For Each Subscale of the REDI For a Sample of Students From a Rocky Mountain Resort Community

Self-esteem	.8632
Emotional Indicators	.8136
Maladaptive Thoughts	.7748
Body Image	.7902
Dieting	.8853
Restricting	.8787
Purging	.6939
Bingeing	.6875

Activity Survey- for Adolescents and Grades 5 to 6. The researcher developed an activity questionnaire for this research project, as a questionnaire appropriate for this research was not available. Two versions were created, one for the adolescent sample (grades 7-12) and one for students in grades 5 and 6. In addition, two questions were included regarding part or full-time employment. The questions in the activity survey include demographics, the exercise and physical activity level of the participants (how

many times per week and how long in minutes of each activity), reasons for exercise and motivators to exercise. The students were also provided with an area to write down anything that related to the questionnaires that they had just filled out.

Analysis

Demographic variables (gender, grade, age and ethnicity) were first analyzed by calculating the frequencies for the sample of student's grades 5 through 12. The Pearson Product Moment correlation matrix was developed to see the relationship between subscales of the REDI. Data were then analyzed using frequency distributions for gender on all eight subscales of the REDI. A 2-way MANOVA was conducted with gender and grade as the independent variables and the eight subscales of the REDI as the dependent measures. This was done in order to analyze the differences between gender and grade on the REDI questionnaire. As recommended by Hummel and Sligo (1971) a two-stage significance-testing procedure was used for this MANOVA. Two separate post hoc analysis techniques were utilized in analyzing the interactions. The Dunn procedure was used due to unequal sample size. The Scheffés tetrad difference technique was used, as it is conservative and allowed the author to look at the differences between differences of groups. A one-way ANOVA was conducted with *reason for exercise* as the independent measure and body image as the dependent measure. A Chi-square test was used to investigate whether reason for participation in activities was the same across all grade levels and to interpret the differences between younger and older students' reason for exercising and participation in sport. The Pearson product moment correlation was used to establish the relationship between the number of activities students participate in and their at-risk scores on the REDI. Finally, a stepwise multiple regression model was used

to examine the association of pre- and young adolescent self-esteem with body image, exercise behaviour and gender. A p value of $< .05$ was regarded as statistically significant.

Results

Demographics

The demographic frequencies of this sample are displayed in Table 1. Within this sample of students, prevalence rates for risk on all eight subscales of the REDI are presented in Table 3. Of the sample in this study, six students (five females, one male) were considered moderate to high risk on all eight of the REDI subscales. Ten students endorsed items on the REDI placing them in the moderate to high-risk range on the subscales that deal specifically with eating disorder behaviour (restricting, purging and bingeing). The majority of students displaying moderate to high risk were females with a ratio of 7:3.

Table 3

Number of Students displaying Signs of Risk on All Eight Subscales of the REDI

	No Risk	Low Risk	Moderate Risk	High Risk
Self-esteem	158 (84.5%)	10 (5.3%)	10 (5.3%)	8 (4.3%)
Emotional Indicators	158 (84.5%)	12 (6.4%)	6 (3.2%)	11 (5.9%)
Maladaptive Thoughts	148 (79.1%)	20(10.7%)	11 (5.9%)	8 (4.3%)
Body Image	155 (87.2%)	16 (8.0%)	12 (1.6%)	4 (3.2%)
Dieting	163 (81.3%)	15 (10.7%)	3 (2.7%)	6 (5.3%)
Restricting	152 (82.9%)	20(3.7%)	5 (10.7%)	10 (2.7%)
Purging	155 (82.9%)	7 (8.6%)	20 (6.4%)	5 (2.1%)
Bingeing	155 (82.9%)	16 (9.6%)	12 (3.2%)	4 (4.3%)

Correlations between REDI subscales

The Pearson correlation coefficients among the eight subscales included in the REDI are given in Table 4. The at-risk factors for eating disorders include: self-esteem, emotional indicators, maladaptive thoughts, body image and dieting which are among the variables of interest in this study. There appears to be fairly strong positive direct relationships between each of the subscales of the REDI. The highest relationship in Table 3 is between restricting and dieting, $r = .899$; this relationship shows that students who have high scores on the dieting subscale will also have high scores on the restricting subscale. This could be attributed to the fact that questions that load on both subscales are similar and sometimes identical in nature.

Table 4

Correlation Matrix of REDI Subscales

Subscale	1	2	3	4	5	6	7	8
Students (n = 187)								
1. Self-esteem	1.00							
2. Emotional Indicators	.697	1.00						
3. Maladaptive Thoughts	.652	.684	1.00					
4. Body Image	.703	.730	.697	1.00				
5. Dieting	.687	.625	.667	.660	1.00			
6. Restricting	.668	.655	.677	.658	.899	1.00		
7. Purging	.568	.575	.559	.580	.778	.781	1.00	
8. Bingeing	.591	.636	.726	.661	.726	.745	.791	1.00

Gender and grade on REDI subscales

A two-way multivariate analysis of variance (MANOVA) was performed on eight dependent variables: self-esteem, emotional indicators, maladaptive thoughts, body image, dieting, restricting, purging and bingeing. Independent variables were gender and grade level (elementary, junior high and senior high).

SPSS MANOVA was used for the analyses. The total of 187 was reduced to 186 with the deletion of a case missing a score on question 35 of the REDI scale. With the use of Wilks' criterion, the combined dependent variables were significantly affected by both gender, $p = .001$, and grade, $p = .001$, as well by their interaction, $p = .021$. As recommended by Hummel and Sligo (1971) when the null hypothesis is rejected, the

separate univariate ratios may be inspected to determine where the significant effects are located.

Self-esteem subscale. Results of a one-way analysis of variance (ANOVA) indicated a significant gender effect [$F(1,180) = 14.278$; $p = .0005$], a nonsignificant grade effect [$F(2,180) = 1.360$; $p = .259$] and a significant interaction [$F(2,180) = 3.229$; $p = .042$]. Post hoc analysis using Scheffé's tetrad difference procedure for the interaction effects indicated two significant comparisons. First, female students consistently were more at-risk on the self-esteem subscale than males between elementary and high school. Females in high school scored higher than both genders in elementary school. However, the opposite was found for males in that males in elementary school were scoring higher than males in high school [$F(2,180) = 6.04$; $p < .05$]. Second, females in high school scored higher than both genders in junior high; however, males had more at-risk scores on the REDI between junior high and high school [$F(2,180) = 3.44$; $p < .05$].

Emotional indicators. Results of a one-way ANOVA indicated a significant gender effect [$F(1,180) = 11.437$; $p = .001$], a nonsignificant grade effect [$F(2,180) = 1.869$; $p = .157$] and a nonsignificant interaction [$F(2,180) = 1.360$; $p = .259$]. There was a significant difference between gender; however, there was no significant difference between grade level and the interaction of gender and grade.

Maladaptive thoughts. Results of a one-way ANOVA indicated a nonsignificant gender effect [$F(1,180) = 3.398$; $p = .067$], a nonsignificant grade effect [$F(2,180) = .989$; $p = .374$] and a nonsignificant interaction [$F(2,180) = .530$; $p = .589$]. There was no significant difference between gender, grade and the interaction.

Body image. Results of a one-way ANOVA indicated a significant gender effect [$F(1,180) = 9.239$; $p = .003$], a significant grade effect [$F(2,180) = .6219$; $p = .002$] and a significant interaction [$F(2,180) = 3.501$; $p = .032$]. Post hoc analysis using the Dunn procedure for the grade effect indicated that all elementary to junior high and elementary to high school pairwise comparisons were significant. Post hoc analysis using Scheffé's tetrad difference procedure for the interaction effects indicated two significant comparisons. First, females showed more at-risk scores on the REDI than males between elementary and high school. As well, both males and females in high school had more elevated scores than elementary [$F(2,180) = 5.46$; $p < .05$]. Second, females had elevated scores in high school greater than those of males and junior high students. Males in junior high were showing more elevated scores than males in high school [$F(2,180) = 5.27$; $p < .05$].

Dieting. Results of a one-way ANOVA indicated a significant gender effect [$F(1,180) = 12.627$; $p = .000$], a nonsignificant grade effect [$F(2,180) = 1.014$; $p = .365$] and a significant interaction [$F(2,180) = 6.604$; $p = .002$]. Post hoc analysis using Scheffé's tetrad difference procedure for the interaction effects indicated two significant comparisons. When comparing elementary and junior high, females in junior high had higher scores than males and females in elementary. Similar to the aforementioned significant comparisons, males in elementary were showing more elevated scores than males in junior high [$F(2,180) = 7.15$; $p < .05$]. The results of a comparison between elementary and high school students were similar to those found between elementary and junior high students [$F(2,180) = 12.96$; $p < .05$].

Restricting. Results of a one-way ANOVA indicated a significant gender effect [$F(1,180) = 6.211$; $p = .014$], a nonsignificant grade effect [$F(2,180) = .317$; $p = .729$] and a significant interaction [$F(2,180) = 4.649$; $p = .011$]. Post hoc analysis using Scheffé's tetrad difference procedure for the interaction effects indicated two significant comparisons between elementary/junior high [$F(2,180) = 4.58$; $p < .05$] and elementary/high school [$F(2,180) = 9.24$; $p < .05$]. It appears that females in junior high and high school consistently have more at-risk scores than both females and males in elementary. The opposite was found for males; they showed more elevated scores in elementary in comparison to junior high and high school

Purging. Results of a one-way ANOVA indicated a significant gender effect [$F(1,180) = 10.948$; $p = .001$], a nonsignificant grade effect [$F(2,180) = .334$; $p = .716$] and a significant interaction [$F(2,180) = 8.533$; $p = .000$]. Post hoc analysis using Scheffé's tetrad difference procedure for the interaction effects indicated three significant comparisons between elementary/junior high [$F(2,180) = 4.48$; $p < .05$], elementary/high school [$F(2,180) = 16.73$; $p < .05$] and junior high/high school [$F(2,180) = 7.379$; $p < .05$]. The results are as follows: females in high school were showing the most at-risk behaviours for purging and females in general were showing more at-risk behaviours than males in each grade level. Males in elementary scored higher than males in junior high and high school and males in junior high scored higher than males in high school.

Bingeing. Results of a one-way ANOVA indicated a significant gender effect [$F(1,180) = 8.772$; $p = .003$], a significant grade effect [$F(2,180) = 3.242$; $p = .041$] and a significant interaction [$F(2,180) = 3.416$; $p = .035$]. Post hoc analysis using the Dunn procedure for the grade effect indicated that elementary to high school and junior high to

high school pairwise comparisons were significant. Post hoc analysis using Scheffé's tetrad difference procedure for the interaction effect indicated that the elementary to high school comparison was significant [$F(2,180) = 4.88$; $p < .05$]. Females again scored higher than males and females in high school scored higher than females in elementary. Males in elementary scored higher than males in high school.

Body image and reason for exercise

Results of a one-way ANOVA indicated a significant main effect on reason for exercising ($F(2,169) = 22.003$; $p = .000$). A post hoc analysis using the Dunn procedure for the main effect of reason for exercising indicated that all pairwise comparisons were significant with *having fun* associated with the least amount of body image risk ($\bar{X} = 11.78$; $SD = 2.87$) followed by "to stay fit and healthy" ($\bar{X} = 13.16$; $SD = 3.44$) and "to lose weight" ($\bar{X} = 17.44$; $SD = 4.00$).

Chi-square for combined grade and reason for exercise

The main reason for participation in exercise and activity significantly differs across combined grade levels $X^2 (2) = 6.192$; $p = .045$. It appears that elementary students (grade 5 and 6) and junior high students (grades 7-9) exercise *to have fun*. High school students (grades 10-12) exercise *to stay fit and healthy* or *to lose weight*. It should be noted that the total of 187 was reduced to 156, with deletion of cases who did not answer the question, *what is the main reason you exercise*?

Number of activities and REDI scores

Results of the Pearson product moment correlation indicated a nonsignificant relationship between the number of activities a student participates in and their scores on the REDI, $r (186) = .051$; $p = .488$. Without further investigation into this relationship,

these results indicate that the number of activities an individual is involved in appears to have no bearing on their at-risk attitudes and behaviours for eating disorders.

Reason for exercise across grade level

Reason for exercising does not appear to significantly differ between pre- (grades 5-8) and young adolescents (grades 9-12), $X^2 = 2.374$; $p = .123$. However, when grade levels are combined to create elementary (grades 5 and 6), junior high (grades 7-9) and high school (grades 10-12), reason for exercising is approaching significance; $X^2 = 5.676$; $p = .059$. This implies that there may be a difference between reason for exercising across specified grade clusters.

Stepwise regression for self-esteem, body image, exercise and gender

A stepwise multiple regression was performed with self-esteem as the dependent variable and body image, exercise behaviour and gender as the independent variables. The criterion for entry into the model was set at $p <= .05$ to avoid type II errors. A combination of gender and body image accounts for 51.4% of the variance in self-esteem. Therefore, it can be said that body image ($\beta = .651$, $p<.05$) and gender ($\beta = 1.013$, $p< .05$) are significant predictors of self-esteem, where as exercise behaviour is not ($p> .05$)

Discussion

As predicted, the findings suggest that females are showing significantly greater signs of risk than males on seven of the eight subscales of the REDI (self-esteem, emotional indicators, body image, dieting, restricting, purging and bingeing). There is also some evidence of gender differences for the maladaptive thoughts subscale; however, the results did not reach significance and therefore should be considered a trend to be examined in future research. Of the students who were considered *moderate* to *high*

risk on all eight subscales as well as for the subscales dealing specifically with eating disorder behaviour, the majority were female. This data is consistent with a number of other studies focusing on the differences between gender and eating disorder behaviours (Le Grange, Tibbs & Selibowitz, 1995; Murnen & Smolak, 1997).

Post hoc analysis using the Dunn procedure for the grade effect indicated that there is a difference of scores on the body image subscale between elementary to junior high and elementary to high school. Similar results were found for the grade effect on the bingeing subscale with differences between elementary to high school and junior high to high school. It appears that for the significant interactions, the largest differences can be seen between elementary and high school, as all comparisons were significant. For body image, dieting, restricting and purging there were differences found between elementary and junior high students. The body image and purging subscales had significant comparisons between junior high and high school students. Overall, females showed more at-risk scores than males at all grade levels. When female students' scores were compared, the older a student was the higher their score on the REDI for each subscale. The opposite was found for males; generally the males from elementary were showing the most elevated scores, more so than junior high and high school students.

The way an individual feels about his/her body and views his/her body may influence the different exercise and eating behaviours in which this individual participates. This study found similar results to those of Cash, Novy and Grant (1994), suggesting that individuals who exercise primarily for the purpose of weight loss tend to have more negative body image. The current research also indicates that the main reason that students participate in sport and activity is significantly different across grade levels,

with younger children and adolescents exercising for fun and older adolescents exercising with the purpose of losing weight or staying fit and healthy. Based on these results, it may be assumed that when pre- and young adolescents view their body negatively they may engage in exercise for the purpose of losing weight rather than to have fun or to increase their level of fitness. Therefore, it is imperative that parents, teachers and coaches work collaboratively to aid children and adolescents in developing healthy attitudes about their weight, shape and reasons for exercising through sport participation.

A relationship, although not statistically significant, was found between number of activities an individual participates in and scores on the REDI. It would be interesting to explore this relationship in terms of the different types and amount of sports and activity in which students who are showing elevated scores on the REDI are participating. Further examination of variables such as gender, age, socioeconomic status and reasons for involvement in sport and activity may shed light on the relationship these variables have to disordered eating attitudes and behaviours.

Through stepwise multiple regression, total time spent exercising or involved in activity was removed from the regression model of self-esteem, body image and gender. The author believes that increased self-esteem comes from involvement in sporting activities; therefore, a different method of examining total activity time may need to be employed. Results from this study indicated that both body image and gender are significant predictors of self-esteem, accounting for 51.4% of the variance in self-esteem. Guinn, Semper and Jorgensen, (1997) found similar results. Based on these results, self-esteem enhancement interventions should certainly include healthy body image promotion for both males and females.

Researchers in eating disorders tend to focus attention on samples from urban settings. Therefore, it would be useful to compare this rural community sample with a nearby urban centre with regards to at-risk behaviours for eating disorders and sport and activity involvement. The activity questionnaire used in this study may need to be improved. Alternatively, a more in depth and validated instrument for collecting data for sport and activity attitudes and involvement may need to be developed to increase the generalizability of these results to larger populations of adolescents. This may be accomplished by creating a total activity score to use in comparison with other scales and clearer instructions that could be understood by a wide variety of students. Use of a larger sample may also increase the generalizability of the sample to populations of adolescents as well as allowing for factor analysis of the REDI scale.

Dramatic physical changes generally accompany puberty in both males and females. Therefore, it would be interesting to explore the role puberty plays in increasing or decreasing self-esteem and body image for adolescents. Reasons and attitudes surrounding involvement in sport and exercise activities could also be examined with regards to age of onset of puberty and gender.

Conclusion

Adolescence is a time of great physical and emotional change, accompanied by altered body perception, weight, relationships, both peer and familial, and thought processing. Therefore, before this time of drastic change, parents, coaches, teachers, mentors and community health professionals should be focused on facilitating pre- and young adolescents in making healthy choices around eating and exercise that affect body image and self-esteem. Through collaboration with community and school personnel,

appropriate intervention and prevention programs may be developed to suit the needs of that community's adolescent population.

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Comparison between a Rocky Mountain Resort Community and a Prairie Rural Community on an Eating Disorder Inventory

Very little research has focused on student attitudes and behaviours towards eating disorders in rural communities. Therefore, the purpose of this paper was to compare the prevalence rates of at-risk behaviours and attitudes associated with eating disorders for students in grades 5 through 8 in two rural communities. Participants included 109 male and female students from a Rocky Mountain Resort community and 129 male and female students from a Central Prairie community. Data was gathered from the two communities with use of a self-report instrument titled, Risk for Eating Disorders Inventory (REDI). Both rural communities demonstrated relatively low risk on all subscales of the REDI. However, it was apparent that students from the Central Prairie community were displaying more at-risk behaviours than students from the Rocky Mountain Resort community. Results of a three-way MANOVA indicated that students in grades 7 and 8 had higher scores on the body image subscale than did students from grades 5 and 6, indicating poorer body image. Results indicated very little difference in level of risk on the REDI between males and females in grades 5 through 8. This could be relevant information for the developers of intervention and prevention programs.

In the last few years, an increase in the incidence of eating disorders in Western societies has become a significant public health problem. A number of authors agree that Western society values slenderness and beauty in females (King, Touyz & Charles, 2000; Le Grange, Tibbs & Selibowitz, 1995; Stice, Schupak-Neuberg, Shaw & Stein, 1994). Therefore, due to the cultural pressure for thinness in females and muscularity in males, there has been an increase in dieting disorders and body image dissatisfaction This

increase can be seen in younger populations, specifically school-aged children and adolescents, with high rates of body dissatisfaction and dieting behaviour (Schur, Sanders & Steiner, 2000). Younger children are not exempt from these behaviours as it is clear that for significant proportions of individuals, the motive for thinness and the practice of weight control begins to develop before adolescence and more noticeably among girls than boys (Hewlings, 2000; Richards, Casper & Larson, 1990; Rolland, Farnill & Griffiths, 1997). Weight control practices in prepubertal girls is of special concern as extreme weight loss at this time can lead to problems or delays in development and puberty (Shisslak, Crago, McKnight, Estes, Gray & Parnaby, 1996).

The findings of Miller, Verhegge, Miller and Pumariega, (1999) suggested that the risk for eating disorders may be greater in rural areas than has previously been believed. There is a paucity of research into the different eating and exercise attitudes and behaviours of pre- and young adolescents in rural communities. There also remains a lack of comparison between rural communities and their nearest urban centre. It is believed by this researcher that rural communities that encourage outdoor sport and activity may have lower rates of at-risk behaviours for eating disorders. This notion is based on research in the developing field of outdoor adventure which suggests that participation in nature based activities results in increased self-esteem (West-Smith, 1997). Because less is known about the effects that outdoor activity has on body image, this author chose to study these effects in hopes of contributing to the growing literature. When developing appropriate school and community based intervention and prevention programs we cannot only focus on urban areas. The issues that adolescents are faced with may differ depending on the community where they are raised.

The aim of this study, therefore, was to compare a rural community in the Rocky Mountains to a rural community in the Central Prairies on the Risk for Eating Disorders Inventory (REDI) (Drummond & Hare, 1999). The questions on the REDI surround topics of at-risk behaviours (self-esteem, body image, maladaptive thoughts, emotional indicators and dieting) and behaviours that are specific to eating disorders (restricting, purging and bingeing). This researcher was interested in identifying the differences between these two communities, based on variables such as gender, grade and location. In particular the researcher was interested in examining the following research questions: (1) How do the subscales on the REDI correlate to one another for the combined samples? (2) What is the prevalence of eating disordered attitudes and behaviours for both samples? (3) Is there a significant difference of scores on the REDI based on location, gender and grade of students? (4) Does at-risk behaviour for eating disorders differ between the Rocky Mountain and Central Prairies rural communities? (5) Is there a difference between male and female level of risk for eating disorders in these two communities? (6) Is there a difference between younger and older students risk for eating disorders in these two communities?

Method

Participants in this study consisted of students in grades 5 through 8 in two rural communities in Canada. The sample of students from the Rocky Mountain rural community was 109 with 47 males and 62 females. The sample of students from the Central Prairies rural community was 129 with 56 males and 73 females. The grade and age frequencies for both samples can be found in Table 1.

The Rocky Mountain resort community was chosen based on the location. The researcher chose to collect data in this community based on the abundance of outdoor sport and leisure activities available. This sample is part of an ongoing study into the effects sport and leisure activity have on disordered eating attitudes and behaviours. The data from the rural community in the Central Prairies is part of an ongoing study in a local hospital to validate the REDI as a diagnostic tool. Participation in both studies was voluntary and informed consent was obtained from each parent or guardian prior to commencing the study and was based on ethical standards of the University of Alberta.

For the Rocky Mountain rural sample, students were instructed not to place their names on the questionnaires to increase confidentiality and honesty of their responses. The researcher was given data from the Central Prairies rural communities sample with names deleted to increase anonymity and confidentiality.

Measures

Risk of Eating Disorders Inventory – REDI. The risk of eating disorders inventory was developed in 1999 to be used in screening large populations of student's grades 5 through 12 for the early detection of eating disorders. A combination of eight subscales comprise the REDI, five of which are considered at-risk behaviours for eating disorders (self-esteem, emotional indicators, maladaptive thoughts, body image and dieting). The remaining three subscales target specific eating disorder behaviours (restricting, purging and bingeing) (Drummond & Hare, 1999).

Analysis

Demographic variables (gender, grade and age) were first analyzed by calculating frequencies for the Rocky Mountain and Central Alberta rural samples of students, grades

5 through 8. Data were then analyzed using frequency distributions for gender on all eight subscales of the REDI for both rural communities. The Pearson product moment correlation matrix was developed to see the relationship between subscales of the REDI for the rural communities. A three-way MANOVA was conducted with gender, grade and location as independent variables and the eight subscales of the REDI as the dependent measures. This was done in order to decipher the differences between gender, grade and location on the REDI questionnaire. Chi-square analysis were used to investigate the following research questions: (4) Does at risk behaviour for eating disorders differ between the Rocky Mountain and Central Alberta rural communities? (5) Is there a difference between male and female level of risk for eating disorders in these two communities? (6) Is there a difference between younger and older student's risk for eating disorders in these two communities?

Results

Demographics

The demographic frequencies for both samples are found in Table 1. Prevalence rates for risk on all eight subscales of the REDI for the Rocky Mountain rural and Central Alberta communities are found in Table 2. From the Rocky Mountain resort community, three students (two males and one female) endorsed items on the REDI placing them in the moderate to high-risk range on all eight subscales. Within the Central Alberta rural community four students (two males and two females) were showing scores on all eight subscales of the REDI, placing them in the moderate to high-risk range.

Table 1

Frequencies and percentages of students grades 5 to 8 on variables of gender, age and grade.

Independent Variables		Rocky Mountain Rural	Central Alberta Rural
Gender			
	Male	47 (43.1%)	56 (43.4%)
	Female	62 (56.9%)	73 (56.6%)
Age			
	10	9 (8.3%)	27 (20.9%)
	11	23 (21.1%)	36 (27.9%)
	12	27 (24.8%)	31 (24.0%)
	13	39 (35.8%)	30 (23.3%)
	14	11 (10.1%)	3 (2.3%)
Grade			
	5	17 (15.6%)	32 (24.8%)
	6	21 (19.3%)	27 (20.9%)
	7	34 (31.2%)	38 (29.5%)
	8	37 (33.9%)	32 (24.8%)

Table 2

Percentage of Students From Two Rural Alberta Communities Displaying Signs of Risk on the REDI

	Rocky Mountain Rural N = 109				Central Prairies Rural N = 129				
	No Risk	Low Risk	Moderate Risk	High Risk	No Risk	Low Risk	Moderate Risk	High Risk	Missing Students
Self-esteem	86.2%	4.6%	3.7%	4.6%	81.4%	2.3%	6.2%	5.4%	4.7%
Emotional Indicators	89%	2.8%	2.8%	5.5%	82.2%	7.0%	3.9%	4.7%	2.3%
Maladaptive Thoughts	80.7%	8.3%	7.3%	3.7%	69.0%	14.7%	6.2%	7.0%	3.1%
Body Image	89%	5.5%	2.8%	2.8%	77.5%	8.5%	7.0%	4.7%	2.3%
Dieting	90.8%	6.4%	0	2.8%	86.0%	7.8%	2.3%	1.6%	2.3%
Restricting	84.4%	8.3%	7.3%	0	79.8%	12.4%	6.2%	0	1.6%
Purging	87.2%	4.6%	7.3%	0.9%	76.0%	4.7%	11.6%	1.6%	6.2%
Bingeing	88.1%	7.3%	3.7%	0.9%	72.1%	8.6%	7.8%	3.9%	7.8%

REDI correlations

The Pearson correlation coefficients among the eight subscales included in the REDI for the combined samples (Rocky Mountain rural and Central Prairies rural) are given in Table 3. The largest difference found between each of the community's correlations was less than .10; therefore, the author chose to combine the correlations between the REDI subscales for both samples. There appear to be fairly strong direct relationships between each of the subscales of the REDI. The strongest relationship in

Table 3 is between restricting and dieting, r = .863. As these two subscales use similar and sometimes identical questions that load on both subscales it may be that these subscales are in essence measuring the same variable.

Table 3

Correlation Matrix for REDI Subscales for Two Rural Communities

Subscale	1	2	3	4	5	6	7	8
1. Self-esteem	1.00							
2. Emotional Indicators	.698	1.00						
3. Maladaptive Thoughts	.706	.685	1.00					
4. Body Image	.681	.711	.690	1.00				
5. Dieting	.661	.638	.676	.666	1.00			
6. Restricting	.638	.692	.689	.651	.863	1.00		
7. Purging	.676	.552	.541	.539	.692	.687	1.00	
8. Bingeing	.666	.663	.725	.691	.646	.659	.717	1.00

Gender, grade and location on REDI subscales

A three-way multivariate analysis of variance (MANOVA) was performed on eight dependent variables: self-esteem, emotional indicators, maladaptive thoughts, body image, dieting, restricting, purging and bingeing. Independent variables were gender, grade (5/6 and 7/8) and location (Rocky Mountain rural and Central Alberta rural).

SPSS MANOVA was used for the analyses. The total sample of 238 was reduced to 219 with the deletion of cases missing total scores on the REDI subscales. With the use of Wilks' criterion, the combined dependent variables were significantly affected by

combined grade, $p = .001$. Gender, $p = .052$ was approaching significance. Location, gender by location, gender by combined grade, location by combined grade and the three way interaction were all nonsignificant.

As suggested by Hummel and Sligo (1971) when the null hypothesis is rejected, the separate univariate ratios may be inspected to determine where the significant effects are located. Therefore, the univariate analysis for combined grade was evaluated.

Results of a one-way analysis of variance (ANOVA) for body image indicated a significant combined grade effect [$F(1,211) = 17.337$; $p = .000$]. It appears that students in grades 7 and 8 are showing higher scores on the body image subscale than students in grades 5 and 6. There was a significant gender effect [$F(1,211) = 4.733$; $p = .031$] when looking at the ANOVA, indicating that females have more elevated scores than males on the body image and dieting subscales . However, because the MANOVA indicated that gender was only approaching significance, this result must be interpreted with caution.

Chi-square analysis

A Chi-square analysis was used to investigate whether there was a difference between the Rocky Mountain rural community and the Central Prairies rural community on level of risk as measured by the REDI (no to low risk and moderate to high risk). Results indicate that level of risk for bingeing is not the same between the two rural communities $X^2 (1) = 4.570$; $p = .033$. This indicates that more students are showing at-risk behaviours on the bingeing subscale than expected in the Central Prairies rural community. Furthermore, more students in the Rocky Mountain rural community are classified as *no* or *low risk* on the bingeing subscale.

Another Chi-square analysis indicated that there appears to be no difference between male and female level of risk on all eight subscales of the REDI. There also appears to be no significant differences between grades 5/6 and 7/8 level of risk on the eight subscales of the REDI.

Discussion

The prevalence rates for both communities are presented in Table 2. Due to unequal cell sizes the researcher could not run a Chi-square for all levels of risk (no, low, moderate and high) and had to combine risk into two categories (no/low and moderate/high). Even though it is not statistically significant, the proportion of students in grades 5 to 8 from the Central Alberta rural community, on average, present with more *moderate* to *high risk* behaviours than the Rocky Mountain resort rural community. The highest prevalence of students displaying at-risk behaviours for the Central Alberta rural community sample was on the maladaptive thoughts and purging subscales.

The reliabilities for both communities were calculated for all eight subscales of the REDI. The purging and bingeing subscale reliabilities were less than would be expected, with a criterion level set at .80 as an acceptable Cronbach's alpha. For future research a larger sample may need to be used in order to factor analyze the REDI subscales. It may be that younger students are interpreting the questions differently than older students.

Results of a three-way MANOVA indicated that level of risk on the body image scale is significantly different for combined grade (5/6 and 7/8). This suggests that within these combined samples, students from grades 7 and 8 were showing more elevated signs of risk on the body image subscale. There was also a gender difference indicating that

females had poorer body image than males. However, this statistic must be treated with caution as it was only approaching significance within the MANOVA. Previous research with students ranging from grades 5 to 12, indicated that combined grade was significant for the majority of subscales on the REDI. There may be no difference between the two rural communities on gender, grade and location because of the age group being studied. The eating attitudes and behaviours are said to shift for the prepubertal adolescent. This would indicate that the largest difference would be evident between highschool and junior high or elementary students.

The Chi-square analysis indicated no significant difference between location and level of risk on the REDI for seven of the eight subscales. Bingeing was the only subscale that was significant, indicating that more students than expected from the Central Prairies rural community were engaging in bingeing like behaviours and attitudes. Further research into other variables such as peer relations, socioeconomic status, size of the community, ethnicity and sport and leisure involvement may shed further light on the differences between these two communities.

There appears to be no significant difference between male and female level of risk on the REDI. It may be that the sample size within this study is fairly small, therefore, gender differences are difficult to decipher. This may be valuable information for the development of intervention and prevention programs within these communities. If there are no significant differences between males and females in Grades 5 through 8, programming may be appropriate across the aforementioned grade levels. If the largest difference appears to be between pre-adolescents and young adolescents, this indicates a need for research into earlier programming. Programming can address issues such as

body image, self-esteem and healthy weight maintenance in order to prevent at-risk or unhealthy weight management in young adolescence. There was also no significant difference between combined grade levels. It may be that both males and females, within grades five to eight, have similar concerns with regards to eating disorders. It may not be until they reach puberty or high school that these differences become noticeable.

Missing data was a problem in this study for the Central Prairies rural community sample. This is common when surveying girls and boys 10 through 14 years of age (Paxton, Wertheim, Gibbons, Szmukler, Hillier & Petrovich, 1991). Missing data in regard to eating attitudes and behaviours of school-aged children may be a reflection of the sensitive nature of body issues during the prepubertal phase of adolescence. The aforementioned issues need to be considered when conducting research or developing prevention and intervention programs that are suitable and comfortable for pre- and young adolescent males and females.

Eating disorder research is generally conducted in large urban centers not rural settings. Therefore, it would be beneficial to research the differences between these rural communities and their nearest urban centre. This would provide curriculum planners throughout Canada with the information necessary for the development of eating disorder intervention and prevention programs. If the urban and rural settings are significantly different and the adolescents are dealing with different issues, programming may need to be slightly modified to encompass these differences.

This researcher believes that involvement in sport and leisure activities in moderation may increase an individuals self-esteem, body image and healthy eating and

weight maintenance. Therefore, it would be interesting to compare the sport and leisure involvement of these two rural samples to their nearest urban area.

It would also be useful to increase the range of grades as well as the sample size studied in order to note any differences between younger and older students. In future research it would be important to increase sample size for both communities in order to increase the reliability and generalizability of scores on the REDI.

Conclusion

In conclusion, the results of this study indicate that further investigation into the characteristics that separate one community from another may need to be addressed. It may be that the differences between communities affect student attitudes and behaviours with regards to eating disorders. This is an important contrast to understand when studying small communities as well as developing or implementing programming of any kind within rural settings.

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Concluding Remarks

There were two primary goals for conducting the current study. First of all, the researcher was interested in determining the current sport and leisure activity involvement of students in grades five through twelve in a Rocky Mountain Resort community. Furthermore, this researcher explored how the student's involvement in sport and leisure activity affects their attitudes and behaviours with regards to eating disorders. The second goal of this study was to compare the prevalence rates of eating disorder attitudes and behaviours of students in grades 5 through 8 in two rural communities in Canada, a Rocky Mountain Resort community and a Central Prairies community. The following is a summary of findings from this study.

As predicted by the researcher, there was a statistically significant difference between male and female level of risk on the REDI from the Rocky Mountain Resort community. It appears that females are engaging in more at-risk behaviours for eating disorders. Findings indicated that the largest difference in level of risk could be seen between elementary and high school students. The results also suggested that students with more negative body image tend to exercise *to lose weight* rather than *to stay fit and healthy*, or *to have fun*. Results from this investigation indicated that the main reason that students participate in sport and leisure activities is different across grade levels. Within the Rocky Mountain Resort rural community, the main reason for exercising by younger children and adolescents was *to have fun* or *to stay fit and healthy*, whereas the older adolescents exercise *to lose weight*.

The results discussed in the paragraph above were important factors to be considered when comparing the Rocky Mountain Resort community to the Central Prairies community. Statistical analysis was difficult due to small sample sizes. Therefore, although not statistically significant there appeared to be a difference between the two communities' level of risk on all eight of the REDI subscales for students in grades 5 through 8. The Central Prairies community showed more *moderate* to *high risk* on all eight subscales, whereas the Rocky Mountain Resort community had consistently lower risk. There was a significant difference between grade level and body image. The students from grades 7 and 8 endorsed items on the REDI placing them in a higher risk category on the body image subscale, indicating more negative body image than students from grades 5 and 6. More students from the Central Prairies community were engaging in at-risk bingeing behaviours than students from the Rocky Mountain Resort community. There did not appear to be any statistically significant differences between gender and grade level of these two communities on the REDI scale. The findings from this preliminary research indicate a need for further research into the differences between rural communities and urban centres and the importance of using a large sample across a wide age spectrum to delineate these differences.

Limitations

An analysis of the limitations of this research project are discussed with regards to administration of questionnaires, the limitations of the REDI scale, the design of the questionnaire used to query sport and activity level and the selection of the student sample.

The researcher chose to use questionnaires in order to survey a large group of students at one time. However, the convenience of surveying large groups of students may overshadow how honestly students respond to each questionnaire. Throughout the administration of the questionnaires students were asked to raise their hands if they did not understand a word or portion of the questionnaire. It is possible that students who were having difficulty with the language of a question or instructions may not ask for help and therefore the accuracy of that particular questionnaire is debatable. The researcher became aware of language that was difficult for the students, based on the questions students asked throughout the administration of each questionnaire. Consequently, the researcher included a description of each word and enhanced instructions for each remaining group of students. It is difficult to decipher whether the improved instructions increased the level of accuracy of student responses on the REDI and the activity questionnaires.

Another limitation of using this questionnaire is that individual response styles cannot be accounted for on close-ended questions. The researcher attempted to rectify this problem by having some open-ended questions at the end of the activity questionnaire; however, a limited number of students chose to fill out this portion of the questionnaire.

The REDI scale was developed in 1999, and is a fairly new tool designed to identify evidence of risk of developing an eating disorder. The REDI has been validated for grades 5 – 12; however, the validation of this tool has yet to be published. The sample of students from the aforementioned research project will aid in the continued validation of the REDI. Another limitation to choosing the REDI is that despite the subscale scores

being very useful in identifying different risk factors for individual participants, the REDI does not possess an overall score. Lack of an overall score hinders the comparisons that can been made to other eating disorder scales such as the EAT. It also impedes the comparisons that could be made to the overall activity score created by the activity questionnaire.

A relatively small sample size hindered this researcher's ability to factor analyze; therefore, the eight subscales of the REDI where chosen as factors within this study. The developers of the instrument used a sufficient sample size that enabled them to delineate the eight subscales as separate risk factors associated with eating disorders.

Due to the lack of an appropriate questionnaire for measuring the sport and activity level of children and adolescents the researcher chose to create a questionnaire specific to this study. A limitation in designing a combined closed and open-ended questionnaire is a lack of control over the way in which students will interpret the questions. It is also difficult to foreshadow what type of difficulties students will have with the questions, especially when dealing with such a range of ages. For future research this questionnaire could be improved by having more generalized instructions that are easily understood by a variety of individuals of different ages. Also, to ensure accuracy of responses, students should be given approximate time in minutes that they could mark in a box for participation in each sport. This would decrease students' confusion about total time spent exercising during a session and how long they exercise per week. This would increase the credibility of the total activity score for each student when comparing with other scales and generalizing to larger samples.

As missing data was a problem for the Central Prairies community, it is this researcher's suggestion that when dealing with topics of a sensitive nature, questionnaire administration should take place in small groups. This would increase the comfort level of students in asking for help if they have problems. Also, smaller group administration enables the researcher to check students' questionnaires to ensure that all information has been filled out to the best of their ability. Although the data from the Central Prairies community was out of this researchers control, the aforementioned precautions were taken with the sample from the Rocky Mountain Resort community. Consequently, there was very little missing data for this sample.

As the Rocky Mountain Resort sample was one of convenience, the researcher can only speculate on the reasons certain students did not participate in the study. To the extent that those individuals not included in this sample systematically differ from this sample, the findings of this study may be biased. To increase sample size in the future, it is recommended that more time be given for students to hand back signed consent forms. As well, reminders from teachers, newsletters and notes sent home to parents or guardians may expedite the timely return of consent forms.

Implications

This research project provided some preliminary data on student eating attitudes and behaviours and involvement in sport and leisure activity in two rural communities. These results may provide students, teachers, administrators, parents, community workers and curriculum planners with a better understanding of the potential risk and protective factors associated with eating disorders. The results also increase the awareness of community differences when planning intervention and prevention programs. If educators

are made aware of the potential risk and protective factors, they are better equipped to deal with the sensitive nature of eating disorders. Awareness would also increase an educators ability to plan classroom discussions or curriculum around topics such as self-esteem, body image, weight management, healthy eating and exercise practices.

In future, this researcher would like to investigate the attitudes and behaviours of students in grades 5 to 12 in the nearest urban centre to both of the rural communities studied. With increased sample size, the author would gain a better understanding of the differences between rural and urban living and how this impacts adolescent eating and exercise attitudes and behaviours. It would be beneficial to increase the grade range of participants when comparing two communities. Results from the Rocky Mountain Resort sample indicated that the largest difference in attitudes and behaviours around eating disorders could be seen between elementary and high school students. The lack of difference found between the two rural communities may be as a result of the small sample of students from grades 5 through 8. To gain a better understanding and to increase generalizability of findings from one rural community to the next, investigation into other variables that could be contributing to the difference would also be important. These variables may include the size of the community, socioeconomic status, ethnicity, the main resource in the community, peer relations and family dynamics.

It is important to note that a lack of significant findings between age, gender and scores on the REDI between these two rural communities may be indicative that male and female students in grade five to eight have similar attitudes and behaviours about eating. Further research would shed light on whether similar programming may be appropriate for both male and female students in grades five through eight.

In conclusion, this researcher believes that it is crucial to delineate the results of this study and others to the students that participated. Students are curious and want to understand how they differ from other adolescents their age within their community and how they differ from students of other communities. In discussion with the students, they voiced concerns about whether I would be coming back to discuss the results of my study. This appeared very important to them as they stressed that whenever someone comes to talk to them, "they never hear anything more from them".

It seemed appropriate to conclude this document with statements from the students living in the Rocky Mountain Resort community:

"Children teenagers need to be educated more about physical education-weight-body fat- effects of bulimia, purging, binge eating, etc. Most people only know what they see on TV and that needs to change. The message needs to be sent across that you are what you are and you're beautiful the way you are. Kids also need more confidence. Self-image is very important to most teens but for the wrong reasons. When I am in shape, eat healthy and am active it gives me a more energetic positive day. Other people do things just to look good or please their boyfriend, or friends. Teenagers need to learn to feel better about themselves." (Female grade 10)

"It's not worth it." (Female grade 10)

"The pressure is not there to lose weight here but being overweight, the battle is within yourself. I try to lose weight, but it's hard. Here people respect people for what kind of a person they are and not as much what they look like." (Female grade 11)

"I don't exercise or play sports to loose weight or stay fit. I do it cause I enjoy it." (Male grade11)

"I'm active because I have a beautiful National Park at my doorstep." (Male grade 12)

"I play these sports because I like them." (Female grade 7)

"I'm fine the way I am." (Male grade 7)

"My coaches motivate me to do my best and be proud of myself which I always am." (Male grade 7)

"This should be done more often and we should know the results." (Male grade 11)

Diagnostic criteria for 307.1 Anorexia Nervosa

A. Refusal to maintain body weight at or above a minimally normal weight for age and height (e.g., weight loss leading to maintenance of body weight less than 85% of that expected; or failure to make expected weight gain during period of growth, leading to body weight less than 85% if that expected).
B. Intense fear of gaining weight or becoming fat, even though underweight.
C. Disturbance in the way in which one's body weight or shape is experienced, undue influence of body weight or shape on self evaluation, or denial of the seriousness of the current low body weight.
D. In postmenarcheal females, amenorrhea, i.e., the absence of at least three consecutive menstrual cycles. (A woman is considered to have amenorrhea if her periods occur only following hormone, e.g., estrogen, administration.)

Specify Type:

Restricting Type: During the current episode of Anorexia Nervosa, the person has not regularly engaged in binge-eating or purging behaviour (i.e., self-induced vomiting or the misuse of laxatives, diuretics, or enemas).

Binge-Eating/Purging Type: During the current episode of Anorexia Nervosa, the person has regularly engaged in binge-eating or purging behaviour (i.e., self-induced vomiting or the misuse of laxatives, diuretics, or enemas).

Diagnostic criteria for 307.51 Bulimia Nervosa

A. Recurrent episodes of binge eating. An episode of binge eating is characterized by both of the following:
   (1) eating, in a discrete period of time (e.g., within any 2-hour period), an amount of food that is definitely larger than most people would eat during a similar period of time and under similar circumstances.
   (2) A sense of lack of control over eating during the episode (e.g., a feeling that one cannot stop eating or control what or how much one is eating).
B. Recurrent inappropriate compensatory behaviour in order to prevent weight gain, such as self-induced vomiting; misuse of laxatives, diuretics, enemas, or other medications; fasting; or excessive exercise.
C. The binge eating and inappropriate compensatory behaviours both occur, on average, at least twice a week for 3 months.
D. Self-evaluation is unduly influence by body shape and weight.
E. The disturbance does not occur exclusively during episodes of Anorexia Nervosa.

Specify Type:

Purging Type: During the current episode of Bulimia Nervosa, the person has regularly engaged in self-induced vomiting or the misuse of laxatives, diuretics, or enemas.

Nonpurging Type: During the current episode of Bulimia nervosa, the person has used other inappropriate compensatory behaviours, such as fasting or excessive exercise, but has not regularly engaged in self-induced vomiting or the misuse of laxatives, diuretics, or enemas.

UNIVERSITY OF ALBERTA

Dear Parents and Students:

We will be coming to in February to pilot a questionnaire with students from grades 5 to 12. The questionnaire deals with at-risk behaviours for the development of eating disorders. As society is becoming more body and weight conscious, professionals and school personnel have noted that this is a concern for some adolescents. It is our hope that you will show an interest in this project and be willing to participate.

The questionnaire is titled: The Risk of Eating Disorder Inventory (REDI). Student's responses will help educators better understand the attitudes and behaviours related to body image, self-esteem, exercise and sport, and eating disorders. This understanding will enable curriculum planners to develop intervention programs. The results from this study will be analyzed and written about in my Master's thesis. We will also be holding an information evening were students, parents and school staff can come and learn about eating disorders and ways to create a body positive school and home environment. In the sessions we will also discuss my research findings and answer any questions people may have.

Throughout the study care will be taken to ensure confidentiality of participants. Students will not be asked to place their names on the questionnaires; only information such as age, gender and grade will be required. This will ensure that the answers from individual students cannot be identified. If parents or students have any questions or concerns they may contact me at (780) 945-1975 or Dr. Hess at (780) 492-1155 and if you want to discuss the matter further with a health professional, we have included a list of names of contacts in the and Edmonton area.

Yours Sincerely,

R. Gokiert

Rebecca Gokiert, B. A.
Graduate Student

Gretchen C. Hess

Gretchen C. Hess, Ph.D.
Supervisor, Professor
Chartered Psychologist

Student's participation is entirely voluntary. There will be no personal consequence for not participating. At any time student's do not feel comfortable or do not want to continue with the questionnaire they are free to do so.

I require permission from you the parents and guardians. Students will also be asked for their consent when the questionnaire is being administered. **Please fill out the section below if you want your child to participate in this study**, and return it to the school as soon as possible.

Parent or Guardian:
I consent to having my son or daughter _____ take part in this study

_____ _____

Signature of parent/guardian Date

Department of Educational Psychology
Faculty of Education

6-102 Education North • University of Alberta • Edmonton • Canada • T6G 2G5
Telephone: (780) 492-5245 • Fax: (780) 492-1318
www.ualberta.ca

PROFESSIONALS WHO WORK WITH EATING DISORDERS

In the Capital Health (Edmonton) Region

Printed by the Eating Disorder Education Organization December, 1999

PSYCHIATRISTS		Ph. No.	FAX
PEDIATRIC-			
Dr. M. Blackman	300-10140 117 St., Edm.	488-3737	488-3755
Dr. A Bremness	CASA	438-0011	437-6133
ADULT-			
Dr. M. Demas	Grey Nuns Hospital	450-7494	450-7496
Dr. C. Kostynuk	308- 11532 100 Ave., Edm.	488-1090	413-1536
Dr. H. Piktel	University Hospital- Eating Disorder Unit	407-6543	407-6672
Dr. E.J. Wiebe	202- 10240 124 St., Edm.	413-9256	413-9257
FAMILY PRACTICE PHYSICIANS			
Dr. Joan Johnston (S.A.C.R.E.D. Group)	405-10830 Jasper Ave., Edm.	423-5508	none
Dr. C. Kyriakides (Pediatrician)	109A- 11910 111 Ave., Edm.	455-5437	452-3220
Dr. Janet Marche	8808 92 St., Edm.	469-7147	469-3871
PSYCHOLOGISTS & SOCIAL WORKERS			
Janet Caryk, Psychologist (And Dr. Wes Miller)	Centre for Cognitive Behav. Therapy 9707 110 St., Edm.	455-8133 455-8181	455-8266
Dr. Judy James, Psychologist	400A- 10508 82 Ave.,E dm.	432-0856	433-5764
Dr. Jo Ann Hammond-Meiers, Psychologist	10009 85 Ave., Edm.	433-2269	NA
Dr. Barb McKenzie (and Mary Jane Henning), Psychologists	8103 70 Ave., Edmonton	440-2924	NA
Yvonne Mireau, Social Worker	#304, 10324 82 Ave., Edmonton	433-1161	NA
Helen Neufeld, Psychologist	24 Grenfell Ave., St. Albert	459-3944	460-8276
Dr. Colleen Orr, Psychologist	Lifeworks Therapy Centre 22 Grenfell Ave., St. Albert	460-7673	459-9807
Dr. Rosa Spricer	11731 41 Ave., Edm.	431-1225	437-3529
Dexa Stoutjesdyk, Psychologist	Northland Family Counselling 216-8625 109 St., Edm.	439-5683	439-5679
Dr. Shirley Vandersteen, Psychologist	Edm.	424-0123	424-0127
DIETITIANS			
Diane Britton	U of A Fitness Centre	492-8437	492-7307
Dianne Drummond	Grey Nuns Community Hospital	450-7342	450-7226
	Royal Alexandra Hospital	491-5789	477-4694
Kim Guay	University of Alberta Hospital	413-9668	453-2841
Carmen Leung	private practice, Edm. (Cantonese speaking)	432-0211	439-9349
Barbara Marriage	private practice, Edm.	469-4037	none
Alyson Seutter	private practice, Edm.	462-0921	461-2181
Nancy Smigerowsky	U of A Hospital, Eating Disorder Unit	407-6543	407-1310
Stefanie Wilson	private practice, Edm.	940-7959	none
ORGANIZATIONS			
EDEO (Eating Disorder Education Organization)	Edmonton, AB.	(780)944-2864	413-1536
National Eating Disorder Information Centre	200 Elizabeth St., CW 1-211, Toronto, Ont. M5G 2C4	(416)340-4156	NA
Overeaters Anonymous	Edmonton	(780)423-2546	NA
Cdn. Assoc. of Anorexia Nervosa and Associated Disorders (AANAD)	Vancouver, B.C.	(604)739-2070	NA

REDI™
Risk of Eating Disorder Inventory

The following questions deal with food and body related issues. Please take time and care to answer the following questions as accurately as possible.

There are two types of questions that require your response on this survey.

A series of numbers between 1 and 3 will appear beside the question. These numbers represent a scale. In the first example below, 1 corresponds to "False" and 3 corresponds to "True". In the second example, 1 corresponds to "Never" and 3 corresponds to "Always".

Please indicate your choice by **circling the number** that best reflects Your feelings.

False	**Somewhat True**	**True**
1	2	(3)

OR

Never	**Sometimes**	**Always**
(1)	2	3

Risk of Eating Disorder Inventory

	False	Some-what true	True
1. If I were more muscular and less fat, I would have more friends.	1	2	3
2. There have been times when I have taken medicine or pills to Lose weight.	1	2	3
3. I am happy with myself.	1	2	3
4. I am often ashamed.	1	2	3
5. I will not be satisfied with my appearance until I have the shape of A model.	1	2	3
6. I have made myself sick (vomited) as a means of controlling my shape and weight.	1	2	3
7. I am happy with the way I look.	1	2	3
8. My life would be better if I could lose some weight.	1	2	3
9. In order to feel good about myself, I have to be something that others expect me to be.	1	2	3
10. My weight or shape affects the way I feel about myself as a person.	1	2	3
11. I worry whether people my age will be attracted to me.	1	2	3
12. No matter how well I do, I don't feel satisfied with my performance.	1	2	3
13. I have learned, from magazines and TV, that men are attracted to women who are very slender and shapely.	1	2	3
14. I wish my body was different.	1	2	3
15. I feel that if I fail someone will not respect me or care for me as much.	1	2	3
16. If I eat something fattening it is converted immediately to fat on my body.	1	2	3
17. In the past a boy/girl has rejected me because I wasn't thin enough.	1	2	3
18. I am often disappointed with myself.	1	2	3
19. My life would be better if I had less fat and more muscle.	1	2	3
20. Being overweight scares me.	1	2	3
21. I am more concerned about my weight than most people my age.	1	2	3
22. Weight and shape are among the main things that affect how I feel about myself.	1	2	3
23. I am committed to losing weight.	1	2	3
24. I have tried to follow a diet to lose weight in the last year.	1	2	3
25. I eat more than I would like to, when I feel anxious, depressed, angry, or lonely.	1	2	3

Risk of Eating Disorder Inventory

	Never	Some-times	Always
26. I feel depressed after I binge eat (answer never if you don't binge eat).	1	2	3
27. I deliberately eat foods that are low in calories.	1	2	3
28. I feel powerless to change my life.	1	2	3
29. I am preoccupied with being thinner.	1	2	3
30. I have been teased about being too fat.	1	2	3
31. I deliberately eat less so that I won't gain weight.	1	2	3
32. I try to exercise to avoid gaining weight.	1	2	3
33. I am satisfied with the shape and size of my body.	1	2	3
34. I feel best when my stomach is empty.	1	2	3
35. I feel that my life is getting worse and worse.	1	2	3
36. I try not to eat foods that are high in fat.	1	2	3
37. It feels like my best is never good enough.	1	2	3
38. When I have eaten too much, I usually eat less the next day.	1	2	3
39. I throw food away that I am supposed to eat because I am afraid of gaining weight.	1	2	3
40. I intentionally skip a meal to lose weight.	1	2	3
41. I feel guilty when I have eaten foods that I shouldn't, and exercising makes the guilt go away.	1	2	3
42. I don't seem to do anything right.	1	2	3
43. I am satisfied with my current weight.	1	2	3
44. I feel like throwing up after I eat.	1	2	3
45. I'm afraid to start eating because I think I won't be able to stop.	1	2	3
46. I am preoccupied with being more muscular.	1	2	3
47. I eat so much in a short period of time that I would be embarrassed if others saw me.	1	2	3
48. I feel uncomfortable after I eat foods with high sugar or fat content.	1	2	3
49. I stay away from foods with sugar in them.	1	2	3
50. I feel that I could control my life if I could control my eating.	1	2	3

Please Turn Over ➡

Now we have some questions for you to answer.

1. My name is: _____

2. I am: ❑ male
   ❑ female

3. I am currently in grade _____ Age: _____

4. Please rate how honestly you filled in this questionnaire on the scale below where 1 stands for "not honest" and 6 stands for "very honest". Circle your answer.

Not Honest **Very Honest**

1 2 3 4 5 6

Thank-you very much for the time and thought you put into responding to this questionnaire. Your participation is appreciated.

For more information about this screen contact:

Dianne Drummond, R.D. (780)450-7613
Suzanne Hare, R.D. (780)450-7458

Food and Nutritional Services
1100 Youville Dr. W.
Edmonton, AB
Canada T6L 5X8
(780)450-7342

RISK OF EATING DISORDER INVENTORY - REDI™ - August, 1999

CARITAS HEALTH GROUP

Activity Survey for Adolescents

Some Facts About You

1. Are you..... **(circle one)**

   Male Female

2. What school do you go to? **(circle one)**

   Jasper Elementary Jasper Junior/Senior High

3. How old are you? _____ years

4. What grade are you in? _____

5. W ere you born in Canada? **(circle one)**

   Yes No

6. How would you describe yourself? **(circle all that apply)**

   Canadian Asian Aboriginal Other_____

7. Education of Mother... **(circle all that apply)**

   Elementary/Junior High High School College University Technical School

   Other_____

8. Education of Father... **(circle all that apply)**

   Elementary/Junior High High School College University Technical School

   Other_____

9. What is your approximate % grades in the following courses? **(fill in to the best of your ability)**

   Mathematics _____ Language Arts _____ Physics _____

   Social Studies _____ Biology _____

   Science _____ Chemistry _____

10. Do you have a paid job outside the home? **(circle one)**

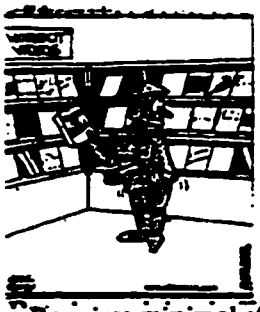
Yes No

11. How Many hours a week do you work? _____ hours.

Exercise and Physical Activity

- **Since school started in September, which activities have you performed regularly in your free time (after school, evenings or weekends)?**
- **(Please circle *Yes* for all that apply and *No* if you do not perform the activity; provide an estimate of the amount of activity per week for all marked *Yes*).**

Mild Exercise



Requires minimal effort, you would not sweat, or breath heavily you could easily hold a conversation

Moderate Exercise

Requires moderate effort, you may start to sweat, you could hold a conversation while exercising

Strenuous Exercise

Requires a lot of effort, you would be sweating, breathing heavily, with an elevated heart rate, it would be difficult to hold a conversation

Walking/Hiking
NO YES

How many times per week?_____
How long did you exercise?_____ (min.)

Mild Moderate Difficult **(circle one)**

Skiing/Snowboarding
NO YES

How many times per week?_____
How long did you exercise?_____ (min.)

Mild Moderate Difficult **(circle one)**

Swimming
NO YES

How many times per week?_____
How long did you exercise?_____(min.)

Mild Moderate Difficult **(circle one)**

Cross country Skiing
NO YES

How many times per week?_____
How long did you exercise?_____ (min.)

Mild Moderate Difficult **(circle one)**

Running
NO YES

How many times per week?_____
How long did you exercise?_____ (min.)

Mild Moderate Difficult **(circle one)**

Skating
NO YES

How many times per week?_____
How long did you exercise?_____ (min.)

Mild Moderate Difficult **(circle one)**

Volleyball/Basketball or Soccer
NO YES

How many times per week?_____
How long did you exercise?_____ (min.)

Mild Moderate Difficult **(circle one)**

Working out (lifting weights)
NO YES

How many times per week?_____
How long did you exercise?_____ (min.)

Mild Moderate Difficult **(circle one)**

Rock/Ice Climbing
NO YES

How many times per week?_____
How long did you exercise?_____ (min.)

Mild Moderate Difficult **(circle one)**

Aerobics
NO YES

How many times per week?_____
How long did you exercise?_____ (min.)

Mild Moderate Difficult **(circle one)**

Biking (Stationary, Mountain or Road)
NO YES

How many times per week?_____
How long did you exercise?_____ (min.)

Mild Moderate Difficult **(circle one)**

Other _____
NO YES

How many times per week?_____
How long did you exercise?_____ (min.)

Mild Moderate Difficult **(circle one)**

Ice Hockey
NO YES

How many times per week?_____
How long did you exercise?_____(min.)

Mild Moderate Difficult **(circle one)**

Other _____
NO YES

How many times per week?_____
How long did you exercise?_____ (min.)

Mild Moderate Difficult **(circle one)**

Put a check mark beside the answers that apply to you

Why do you exercise?

To have fun _____
To lose weight _____ **(check all that apply)**
To stay fit and healthy _____
To make friends _____
Other _____

Which of the above is the main reason that you exercise?_____

Who motivates you to participate in the above sports? Do you do these sports because of any of the following people? **(Circle yes or no).**

Friends	**yes**	**no**
Parents	**yes**	**no**
Coaches	**yes**	**no**
Teachers	**yes**	**no**
Other family members	**yes**	**no**
Self	**yes**	**no**
Other_____		

Do you participate in any other activities? What do you do after school?

_____

_____

_____

Tell me anything else that relates to these questions that you think I should know.

_____

_____

_____

Activity Survey For Grades 5 to 6

Some Facts About You

1. Are you..... **(circle one)**

   Male Female

2. What school do you go to? **(circle one)**

   Jasper Elementary Jasper Junior/Senior High

3. How old are you? _____ years

4. What grade are you in? _____

5. W ere you born in Canada? **(circle one)**

   Yes No

6. How would you describe yourself? **(circle all that apply)**

   Canadian Asian Aboriginal Other_____

7. Education of Mother... **(circle all that apply)**

   Elementary/Junior High High School College University Technical School

   Other_____

8. Education of Father... **(circle all that apply)**

   Elementary/Junior High High School College University Technical Schooi

   Other_____

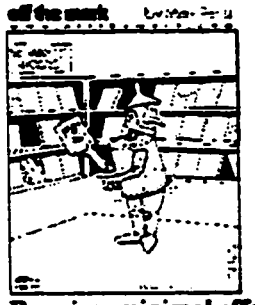
9. Circle the grade that you received on your last report card? **(fill in to the best of your ability)**

Mathematics	4	3	2	1
Language Arts	4	3	2	1
Social Studies	4	3	2	1
Science	4	3	2	1

Exercise and Physical Activity

- **Since school started in September, which activities have you performed regularly in your free time (after school, evenings or weekends)?**
- **(Please circle *Yes* for all that apply and *No* if you do not perform the activity; provide an estimate of the amount of activity per week for all marked *Yes*).**

Mild Exercise



Requires minimal effort, you would not sweat, or breath heavily you could easily hold a conversation

Moderate Exercise

Requires moderate effort, you may start to sweat, you could hold a conversation while exercising

Strenuous Exercise

Requires a lot of effort, you would be sweating, breathing heavily, with an elevated heart rate, it would be difficult to hold a conversation

Walking/Hiking
NO YES

How many times per week?_____
How long did you exercise?_____ (min.)

Mild Moderate Difficult **(circle one)**

Cross country Skiing
NO YES

How many times per week?_____
How long did you exercise?_____ (min.)

Mild Moderate Difficult **(circle one)**

Swimming
NO YES

How many times per week?_____
How long did you exercise?_____ (min.)

Mild Moderate Difficult **(circle one)**

Running
NO YES

How many times per week?_____
How long did you exercise?_____ (min.)

Mild Moderate Difficult **(circle one)**

Skiing/Snowboarding
NO YES

How many times per week?_____
How long did you exercise?_____ (min.)

Mild Moderate Difficult **(circle one)**

Volleyball/Basketball or Soccer
NO YES

How many times per week?_____
How long did you exercise?_____ (min.)

Mild Moderate Difficult **(circle one)**

Rock/Ice Climbing NO YES How many times per week?_____ How long did you exercise?_____ (min.) Mild Moderate Difficult **(circle one)**	**Working out (lifting weights)** NO YES How many times per week?_____ How long did you exercise?_____ (min.) Mild Moderate Difficult **(circle one)**
Biking (Stationary, Mountain or Road) NO YES How many times per week?_____ How long did you exercise?_____ (min.) Mild Moderate Difficult **(circle one)**	**Aerobics** NO YES How many times per week?_____ How long did you exercise?_____ (min.) Mild Moderate Difficult **(circle one)**
Ice Hockey NO YES How many times per week?_____ How long did you exercise?_____(min.) Mild Moderate Difficult **(circle one)**	**Other** _____ NO YES How many times per week?_____ How long did you exercise?_____ (min.) Mild Moderate Difficult **(circle one)**
Skating NO YES How many times per week?_____ How long did you exercise?_____ (min.) Mild Moderate Difficult **(circle one)**	**Other** _____ NO YES How many times per week?_____ How long did you exercise?_____ (min.) Mild Moderate Difficult **(circle one)**

Put a check mark beside the answers that apply to you

Why do you exercise?

To have fun	_____	**(check all that apply)**
To lose weight	_____	
To stay fit and healthy	_____	
To make friends	_____	
Other _____		

Which of the above is the main reason that you exercise?_____

Who motivates you to participate in the above sports? Do you do these sports because of any of the following people? **(Circle yes or no).**

Friends	**yes**	**no**
Parents	**yes**	**no**
Coaches	**yes**	**no**
Teachers	**yes**	**no**
Other family members	**yes**	**no**
Self	**yes**	**no**
Other_____		

Do you participate in any other activities? What do you do after school?

_____

_____

_____

Tell me anything else that relates to these questions that you think I should know.

_____

_____

_____