EATING DISORDERS AMONG ADOLESCENTS

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Spring 2011

A thesis
submitted in partial fulfillment
of the requirements
for a baccalaureate degree
in Health Policy and Administration
with honors in Health Policy and Administration

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ABSTRACT

Eating disorders have become a more prevalent illness in recent years. The purpose of this study is to identify characteristics that are associated with an increased risk of having an eating disorder among adolescents. This study analyzes the National Longitudinal Study of Adolescent Health, also known as the ADD Health Data set. The data is examined using descriptive cross-tabulations, followed by regression analysis. The study found that anorexia is associated with being female, being white, reporting not feeling close to people at school, a part of school, or happy at school, feeling depressed, poorer self-rated health, perceiving oneself as overweight, exhibiting some eating disorder-related behaviors, being less likely to have a mother with lower education, and reporting not being close to his or her mother. With knowledge about the risk factors that this study found to be associated with a higher risk of having anorexia, policymakers, counselors, teachers, parents, and others who work with adolescents will be better able to detect when an adolescent has an eating disorder, and intervene with the person’s problem before it becomes detrimental to the person’s health.
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Eating Disorders Among Adolescents

Introduction

An eating disorder is defined as a condition in which one eats or refuses to eat to fulfill a psychological rather than a physical need (Palme, 2008). It is characterized by extremes in which a person eats little to nothing or overeats (NIMH, 2009). Anorexia nervosa and bulimia are the two foremost kinds of eating disorders (NIMH, 2009). Anorexia is characterized by starvation due to adolescents’ distorted views that they appear overweight, whereas bulimia involves binge eating and purging soon after by vomiting or taking laxatives (NIMH, 2009). Both are recognized as important mental health issues.

The majority of people who have characteristics of an eating disorder are adolescents and young adults; however, some reports have shown that eating disorders can develop in early childhood as well as late adulthood, and is more common in females (NIMH, 2009). However, only 1 out of 3 people with anorexia nervosa and six percent of people with bulimia obtain mental health care (DeBarbieri, 2007). Despite the evidence, the fundamental biological, behavioral, and social origins of eating disorders among adolescents are not well known by researchers (NIMH, 2009).

The purpose of this study is to identify characteristics that are associated with an increased risk of having an eating disorder among adolescents. A range of variables are analyzed among adolescents with and without symptoms of an eating disorder in order to identify significant associations. Data from the National Longitudinal Study of Adolescent Health are analyzed. This dataset is uniquely suited for studying eating disorders among adolescents because it is nationally representative and contains a wide range of information on relevant aspects of adolescents’ social and behavioral health.
Background

Motivation for This Study

Eating disorders have become a more prevalent illness in recent years. They affect up to 24 million Americans and 70 million individuals worldwide (Renfrew Center Foundation, 2003). Actually, one of the top chronic illnesses that most commonly affect adolescents is anorexia nervosa (Public Health Service’s Office in Women’s Health, 2000). Women between 12 and 25 years of age comprise of more than 90 percent of people affected by eating disorders (National Mental Health Information Center, 2003). Among women surveyed on a college campus, 91% of them had dieted in attempts to manage their weight, which is the most common behavior that leads to eating disorders. Indeed, out of all women in their college years, about 19% are bulimic (Alliance for Eating Disorders Awareness, 2005).

Unfortunately, this is also becoming a growing problem for young girls. According to Time Magazine, by the time they are in fourth grade, 80% of all children will have been on a diet (Alliance for Eating Disorders Awareness, 2005). Similarly, 42% of girls between 1st and 3rd grade wish they were thinner (Collins, 1991).

Not only are eating disorders a prevalent illness among girls, but they are also becoming more common among males. About 10 to 15% of people with anorexia or bulimia are male (Carlat, 1997). Likewise, a study conducted by Cornell University surveyed male football players and found that 40% of them had some form of an eating disorder (Alliance for Eating Disorders Awareness, 2005). Moreover, 40% of those affected by binge eating disorder are men (American Psychiatric Association, 1994).
Eating disorders are a problem because they create a number of health risks to all those affected. With anorexia, the heart rate can slow down and blood pressure may be lowered, which increases the risk of heart failure. Brain damage may also occur as a result of starvation, and the hair and nails may become brittle. The skin may become very dry and yellow. If anorexia is severe, the bones can grow brittle due to calcium loss (National Mental Health Information Center, 2003).

In bulimic patients, the medical symptoms are somewhat different, although some patients have both bulimic and anorexic symptoms. For one, the acid in vomit can cause enamel on teeth to wear off, and the esophagus may become damaged and inflamed. The stomach can also become damaged as a result of vomiting. Chemical imbalances and loss of necessary minerals in the body can lead to irregular heartbeats, heart failure, and even death. Peptic ulcers, pancreatitis (inflammation of the pancreas), and chronic constipation may also arise (National Mental Health Information Center, 2003).

Binge-eating disorder, where the patient engages in eating abnormally large amounts of food, causes a number of health problems as well. Most obviously, binge eating can lead to obesity, which in turn causes high blood pressure along with high cholesterol. Fatigue, joint pain, Type II diabetes, gall bladder disease, and heart disease are other consequences (National Mental Health Information Center, 2003). Binge eating also decreases satiety, causing patients to increase their energy intake (Mirch et al., 2006).

As can be seen, eating disorders create numerous health problems and may even be fatal. Out of all mental disorders, eating disorders have the highest mortality rate (South Caroline Department of Mental Health, 2006). An anorexic young woman increases her chances of dying
by twelve-fold compared to other women her age without anorexia (Alliance for Eating Disorders Awareness, 2005). Five to ten percent of people with anorexia will die within ten years, 18 to 20 percent die within twenty years, and only 50 percent have been found to be ultimately cured (American Psychiatric Association, 1993).

Because of the scope of this problem and its harmful consequences, research should be done to give more insight as to who is more likely to develop an eating disorder. Not enough research has been conducted, and current research is not funded adequately (National Eating Disorders Association, 2010). Because eating disorders are not similar to neurological disorders, for example, in that they cannot be pinpointed to a specific lesion in the brain, there must be other determinants that influence the onset of an eating disorder. The question to be addressed is: “What characteristics of adolescents, including their race, socioeconomic status, and social and mental health, are associated with an elevated risk of having an eating disorder?” With increased knowledge of risk factors that can lead to these illnesses, preventive policies and strategies can be developed for school counselors, parents, and physicians to use.

This thesis investigates risk factors that may be associated with the prevalence of an eating disorder among adolescents. With this knowledge, child caregivers, school officials, counselors, and others who interact with adolescents may be able to deal with those who are afflicted with eating disorders in a more efficient manner. This information can also be useful to policymakers in implementing effective strategies to reduce the incidence of eating disorders.

Prior Research on Risk Factors for Anorexia

No specific risk factor or cause has been pinpointed to be associated with the presence of an eating disorder. However, many factors have been found to be related to an increased risk of
developing an eating disorder. For example, gender is a major risk factor. Girls are more susceptible to becoming afflicted with an eating disorder, mainly because they face more pressure to be thin (Derenne et. al., 2006). In addition, people who have had parents or siblings with an eating disorder are more likely to develop one as well (Mayo Clinic, 2010).

Another major risk factor is the media, which constantly portrays successful, young, thin people as beautiful (Mayo Clinic, 2010). As a result, adolescents believe that the only way to be considered as “beautiful” is to be thin, leading to eating disorders. Dieting may also increase the risk of having an eating disorder. Those who diet may be positively reinforced by compliments about their changing appearance, leading them to diet further that can eventually result in an eating disorder (Mayo Clinic, 2010). Another risk factor, transitions, can have an effect as well. Transitions are drastic changes that may include going to college, moving, getting a new job, or a relationship breakup. All these can cause emotional distress, making one more vulnerable to develop an eating disorder (Mayo Clinic, 2010).

Those who participate in athletics may experience increased pressure to maintain a low weight. Because they are encouraged to be thin in order to achieve a competitive edge, young athletes are more likely to have an eating disorder, especially dancers, gymnasts, jockeys, runners, wrestlers, and cheerleaders (Scholten, 2009). A higher risk is also associated with certain professions including modeling, acting, entertainment, and Greek life (sororities especially), all of which experience social pressures to be thin (Scholten, 2009).

A history of sexual abuse is quite common among those who have an eating disorder, particularly in women who have bulimia (Scholten, 2009). Similarly, according to a study by Johnson and colleagues (2002), adolescents affected by an eating disorder were found to receive
less affection from their fathers, communicate less with them, spend less time with them, and have fathers with a low level of education. No associations, however, were found with maternal characteristics (Johnson, 2002). More broadly, family influences have been shown to affect the presence of an eating disorder. People who have insecurities due to their families being too critical of them, either about their weight or more generally, are at a higher risk of developing an eating disorder (Mayo Clinic, 2010).

Biochemical factors have also been hypothesized to play a role in developing an eating disorder. Recent studies have shown that patients who have recovered from an eating disorder exhibit irregular brain pathways involving the neurotransmitter serotonin. This shows that serotonin and other chemicals in the brain may influence the onset of anorexia. However, further research must be performed in order to confirm these speculations (Scholten, 2009).

In addition, ethnicity may also be a factor in determining risk for an eating disorder. Asians, Native Americans, and African Americans are less likely to develop an eating disorder than Caucasians (Academy for Eating Disorders, 2010). However, not much research has been done regarding ethnicity and eating disorders and further investigations are needed.

Moreover, emotional disorders increase one’s susceptibility in developing an eating disorder. Those affected by depression, anxiety disorders, and obsessive-compulsive disorder are at increased risk of having an eating disorder (Mayo Clinic, 2010). Between 40-96% of all people with eating disorders experience depression or another mental disorder (Scholten, 2009).

Because of the minimal research currently available, not enough up-to-date information has been found regarding risk factors for developing an eating disorder. Specifically with regard to race, social relationships, and emotional health, little is known about their influence on
developing an eating disorder. This thesis will investigate these risk factors among adolescents with and without eating disorders, and determine whether an association exists.

**Conceptual Framework and Hypotheses**

The specific hypotheses that are tested are:

1. Caucasian adolescents are more likely than adolescents of other races to have an eating disorder
2. Having a mother with a low level of education is associated with having an eating disorder
3. Poor social relationships (i.e., not fitting in, not feeling accepted) are associated with a higher risk of having an eating disorder
4. Poor mental health (i.e., being depressed) is associated with a higher risk of having an eating disorder

These hypotheses were chosen because according to prior research, adolescents that are Asian, African American, or Native American are less likely to develop an eating disorder. However, not much research has been found to prove this speculation. Thus, this study investigates whether Caucasian adolescents are more likely to have an eating disorder than other adolescents. Likewise, mother’s education level may be another factor that can influence the development of an eating disorder. Some research has found that a low socioeconomic status may be related to having an eating disorder but it has not been confirmed. As a result, this study examines whether a family with low socioeconomic status, in terms of the mother’s education level, is related to the development of an eating disorder among adolescents. In addition, some research has shown that adolescents with emotional problems such as depression and anxiety disorders are more likely to have an eating disorder. This study further investigates this issue by determining whether depression and social health, such as fitting in at school and feeling accepted by others, are associated with the presence of an eating disorder.
According to the conceptual framework depicted in Figure 1 on page 17, a number of factors affect the chances of having an eating disorder as well as each other. Demographic factors such as age, race/ethnicity, socioeconomic status, and gender may play a role in the development of an eating disorder among adolescents. This study is examining whether one of these factors, race, is associated with an increased risk. Likewise, social relationships between adolescents and their friends, families, and romantic partners influence the adolescents’ chances of having an eating disorder. This study determines if the feelings of being accepted/liked and fitting in affect having an eating disorder; these feelings are indicative of low self-esteem, which may be more associated with having an eating disorder, according to one study (Kim & Lennon, 2007). This goes hand-in-hand with adolescents’ emotional health, which includes depression, anxiety disorders, and obsessive-compulsive disorder. Poor emotional health may lead to an eating disorder. Depression is one aspect of emotional health that is studied to determine if there is a correlation between depression and the presence of an eating disorder.

Other factors also have an effect on the risk of having an eating disorder. Namely, aspects of physical health such as body mass index and fitness level, influence the likelihood of having an eating disorder. Also, the school/workplace/environment is likely to increase the chances of having an eating disorder. This includes social pressure from work, the media, and participation in sports. Moreover, adolescents’ history of sexual abuse and family history increase the likelihood of having an eating disorder. Although all these other factors may be associated with having an eating disorder, they cannot be analyzed in this study because the dataset does not contain information about them. Consequently, they are all placed in a separate box in the conceptual framework with a dashed line to indicate that they will not be analyzed. Because these extraneous factors will not be studied or controlled for, the internal validity of the
study may be threatened. For example, having a history of sexual abuse may be related to low socioeconomic status. If an association is found between low socioeconomic status and having an eating disorder, this may actually be due to having a history of sexual abuse and not low socioeconomic status.

**Research Methods**

**Research Design**

This study is conducted using a cross-sectional design. A cross-sectional study is used to determine the prevalence at a given point of time for a specific population. Disease and exposure are measured at the same time to find the frequency and characteristics of a disease. Cross-sectional data is useful in determining the prevalence of a certain condition in the population being studied (California Department of Health, Environmental Health Investigations Branch, 2009). In this case, the population being studied is adolescents in the National Longitudinal Study of Adolescent Health. We examined race, mother’s education level, social health, which is comprised of self-reported feelings of fitting in and feeling accepted, and mental health, which includes depression, in relation to eating disorder status.

The data is examined using descriptive cross-tabulations, followed by regression analysis. The study determines if there is an association between having an eating disorder and the characteristics that are analyzed. Studying prevalence is a good way to determine an association. A disadvantage of a cross-sectional study is that, because the subjects are only measured once, no causal relationships can be determined. It may not be possible to determine whether the exposure preceded or followed the disease (Environmental Health Investigations Branch, 2009). Thus, in this research study, no causal inferences can be made. However, associations can be
determined, and these can help in identifying further research to determine if a causal relationship exists as well.

Data

This study analyzes the National Longitudinal Study of Adolescent Health, also known as the ADD Health Data set. This is a longitudinal panel study of American adolescents between grades 7 and 12 during the 1994-1995 academic school year. This dataset collects information regarding adolescents' social, economic, psychological and physical health as well as data about their family, neighborhood, community, school, friendships, peers, and romantic relationships. This enables researchers to study how adolescents' relationships and environment influence their health and successes in their future (UNC Carolina Population Center, 2009).

The survey was conducted in a series of waves. It started in 1994 and a total of 4 waves were collected. The most recent wave was conducted in 2008 (UNC Carolina Population Center, 2009). In this study, data from Waves I and III will be analyzed. Wave I surveyed adolescents in grades 7 through 12 while Wave III surveyed the same adolescents six years later when they were aged 18 to 26 (UNC Carolina Population Center, 2009). All study variables come from Wave 1 except for diagnosis of anorexia, which was only asked in Wave III.

Wave I includes data collected from in-school paper-based surveys from adolescents between 1994 and 1995. The sampling frame was school-based for two reasons: it was an efficient way to study the intended population and was comparatively feasible to reach most respondents' equals. Peers are important for the study because they are hypothesized to have considerable influence on respondents (UNC Carolina Population Center, 2009). From the in-school sampling frame, all respondents were given an in-school questionnaire, which was an
instrument that was set for optical scanning. It surveyed more than 90,000 students (UNC Carolina Population Center, 2009).

An in-home sampling frame was conducted as well. This consisted of adolescents who responded to the in-school questionnaire but also included those who did not complete the survey but were listed on the school roster. About 12,105 adolescents total were surveyed in the in-home survey (UNC Carolina Population Center, 2009). Those in the in-home sampling frame were given an in-home interview between April and December 1995. The majority of interviews were conducted in the respondents’ homes, and no paper questionnaires were used to protect confidentiality. Rather, all data were collected on laptop computers (UNC Carolina Population Center, 2009).

In addition, Wave I also consisted of a parent questionnaire. This interviewed one of the adolescents’ parents, preferably the resident mother, and asked questions regarding family income, the parents’ education, etc. (UNC Carolina Population Center, 2009). The study will utilize this information regarding the mother’s education level in order to determine whether it is associated with the presence of an eating disorder in adolescents.

Wave III was conducted in 2001 and 2002. Any Wave I respondents who were out of the country were omitted from the data. However, efforts were made to interview those who were located in correctional facilities (UNC Carolina Population Center, 2009). Wave III consisted of an In-Home Interview and Questionnaire, and all the data were recorded in laptop computers to protect confidentiality. The survey contains a majority of the same questions, but some were changed and new sections became focused on topics more relevant to young adults in order to enhance the longitudinal study measures (UNC Carolina Population Center, 2009).
The population being studied is adolescents between the ages of 18 and 26. The purpose of the study is to determine if there is a correlation between certain risk factors and the prevalence of an eating disorder among adolescents. The total sample size in Wave III was 15,170 respondents, all of whom were surveyed in Wave I as well (UNC Carolina Population Center, 2009).

**Analysis Methods**

The following variables are included in the analysis:

- **Female**: This is a 0/1 variable coded = 1 if the person is female, and 0 if male.

- **White Race**: 0/1 variable coded = 1 if the person is white race, and 0 if otherwise.

- **Don’t Feel Close to People at School**: The statement in the ADD Health survey was “you feel close to people in your school,” and respondents were asked to state whether they agree, strongly agree, neither agree nor disagree, disagree, or strongly disagree. This is a 0/1 variable coded = 1 if the respondent disagreed or strongly disagreed, and 0 if otherwise.

- **Don’t Feel Part of School**: The statement in the survey was “you feel like you are part of your school,” and respondents were asked to state whether they agree, strongly agree, neither agree nor disagree, disagree, or strongly disagree. This is a 0/1 variable coded = 1 if the respondent disagreed or strongly disagreed, and 0 if otherwise.

- **Not Happy at School**: The statement in the survey was “you are happy to be at your school,” and respondents were asked to state whether they agree, strongly agree, neither agree nor disagree, disagree, or strongly disagree. This is a 0/1 variable coded = 1 if the respondent disagreed or strongly disagreed, and 0 if otherwise.
• Felt Depressed: The survey asked respondents how often they felt depressed within the past week, and respondents were asked to report if they felt depressed never or rarely, sometimes, a lot of the time, or most of the time or all of the time. This is a 0/1 variable coded = 1 if the person felt depressed a lot of the time or most or all of the time, and 0 if otherwise.

• Felt Disliked by People: The survey asked respondents how often they felt disliked by people within the past week, and respondents were asked to report if they felt disliked never or rarely, sometimes, a lot of the time, or most or all of the time. This is a 0/1 variable coded = 1 if the person felt disliked a lot of the time or most or all of the time, and 0 if otherwise.

• Poor Health: The question in the survey asked respondents how their health was in general, and respondents were asked to state whether it was excellent, very good, good, fair, or poor. This is a 0/1 variable coded = 1 if the person stated their health was poor, and 0 if otherwise.

• Think Overweight: The question in the survey asked respondents how they think of themselves in terms of weight. Respondents answered with either very underweight, slightly underweight, about the right weight, slightly overweight, or very overweight. This is a 0/1 variable coded = 1 if the person believed they were slightly or very overweight, and 0 if otherwise.

• Made Yourself Vomit: 0/1 variable coded = 1 if the person reported making him/herself vomit within the past week.

• Took Diet Pills: 0/1 variable coded = 1 if the person took diet pills within the past week.

• Took Laxatives: 0/1 variable coded = 1 if the person took laxatives within the past week.
• Hispanic Origin: 0/1 variable coded = 1 if the person is of Hispanic origin.
• Low Education Level for Mom: 0/1 variable coded = 1 if the person’s mom had education lower than college level.
• Had Romance: 0/1 variable coded = 1 if the person had romantic relationship within the past year
• Not Close to Mom: The question in the survey asked respondents how close they feel to their mother. Respondents answered with either not at all, very little, somewhat, quite a bit, or very much. This is a 0/1 variable coded = 1 if the respondent answered not at all or very little, and 0 if otherwise.

The independent variables in this study are the risk factors that are hypothesized to be associated with having an eating disorder. These include all variables shown in Table 1 (see results section). The dependent variable is the presence of an eating disorder. This is determined from answers to a question asking whether the respondent had ever been told that s/he had an eating disorder. Statistical analysis determines whether there is an association between having an eating disorder and each characteristic. Bivariate associations are determined based on chi square tests. A t-test is used at the conventional level of p<0.05 to determine if there is a significant difference between the groups and if it is appropriate to say that those specific factors are associated with an elevated risk of developing an eating disorder. Multiple regression analysis is conducted to assess the relationship between the independent variables and the dependent variable, taking all the independent variables into account. Odds ratios are calculated from the multiple logistic regression coefficients, and. 95% confidence intervals are determined to investigate whether the odds ratios are significantly above or below 1.0.
Results

Table 1 shows descriptive characteristics of the sample, displayed separately for those who do and do not have anorexia. As indicated by the p-values, in these bivariate analyses many of the measured characteristics are significantly related to anorexia status at the <0.05 significance level. Anorexia is associated with being female, being white, reporting not feeling close to people at school, a part of school, or happy at school, feeling depressed, poorer self-rated health, perceiving oneself as overweight, exhibiting some eating disorder-related behaviors, being less likely to have a mother with lower education, and reporting not being close to his or her mother.

<table>
<thead>
<tr>
<th></th>
<th>Anorexia</th>
<th>No Anorexia</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>91.30%</td>
<td>50.90%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>White Race</td>
<td>82.60%</td>
<td>65.80%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Don't Feel Close to People at School</td>
<td>22.30%</td>
<td>13.26%</td>
<td>0.005</td>
</tr>
<tr>
<td>Don't Feel Part of School</td>
<td>18.75%</td>
<td>11.96%</td>
<td>0.029</td>
</tr>
<tr>
<td>Not Happy at School</td>
<td>36.61%</td>
<td>16.67%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Felt Depressed</td>
<td>18.42%</td>
<td>9.67%</td>
<td>0.002</td>
</tr>
<tr>
<td>Felt Disliked by People</td>
<td>9.65%</td>
<td>5.81%</td>
<td>0.085</td>
</tr>
<tr>
<td>Poor Health</td>
<td>13.04%</td>
<td>6.59%</td>
<td>0.006</td>
</tr>
<tr>
<td>Think Overweight</td>
<td>40.87%</td>
<td>31.40%</td>
<td>0.030</td>
</tr>
<tr>
<td>Made Yourself Vomit</td>
<td>2.02%</td>
<td>0.28%</td>
<td>0.002</td>
</tr>
<tr>
<td>Took Diet Pills</td>
<td>5.05%</td>
<td>0.87%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Took Laxatives</td>
<td>1.01%</td>
<td>0.25%</td>
<td>0.151</td>
</tr>
<tr>
<td>Hispanic Origin</td>
<td>9.73%</td>
<td>11.50%</td>
<td>0.560</td>
</tr>
<tr>
<td>Low Education Level for Mom</td>
<td>52.94%</td>
<td>70.34%</td>
<td>0.001</td>
</tr>
<tr>
<td>Had Romance</td>
<td>59.65%</td>
<td>55.40%</td>
<td>0.366</td>
</tr>
<tr>
<td>Not Close to Mom</td>
<td>18.35%</td>
<td>10.66%</td>
<td>0.010</td>
</tr>
</tbody>
</table>
Table 2 presents results of the multiple logistic regression analyses. Once all the independent variables are considered together, only some of those which had been significant in the bivariate analyses remained significant. Females have odds of being diagnosed with anorexia that are over ten times higher than the odds for males. This is consistent with prior research showing that eating disorders are more prevalent among females than males. Likewise, people who are white have odds of having an eating disorder that are three times higher than those of other races, confirming the hypothesis regarding race. Poor mental health is also associated with having an eating disorder, as hypothesized. Subjects in the study who were not happy at school had odds that were two times greater of having an eating disorder than those who were not.

In addition, respondents who reported that they were in less than excellent or very good health had odds of having anorexia that were two times higher than those who did not. Those
who took diet pills were more than three times higher odds of having an eating disorder, showing that such behavior is associated with having an eating disorder.

On the other hand, Table 2 shows that those who had mothers with a low level of education, meaning less than a college degree, had significantly lower odds of having an eating disorder compared to those who had mothers with at least a college education. This is not consistent with the hypothesis that adolescents who have mothers with a low education level are more likely to have an eating disorder.

Discussion and Conclusions

The goal of this study was to determine which of the variables measured were associated with a higher risk of having an eating disorder. Four hypotheses were proposed. First, Caucasian adolescents are more likely to have an eating disorder than those of other races. According to Table 1, 82.6% of anorexics were Caucasian, while only 65.8% of non-anorexics were Caucasian. Because the p-value is less than .05, this result is significant. Likewise, Table 2 shows that Caucasian respondents are three times more likely to have anorexia than those of other races, consistent with the first hypothesis.

The second hypothesis was that having a mother with a low level of education is associated with having an eating disorder. However, according to tables 1 and 2, respondents whose mothers had a low level of education were less likely to have anorexia.

The third hypothesis was poor social relationships were associated with a higher risk of having anorexia. These relationships include feeling close to people at school, feeling part of the school, feeling happy at school, and feeling disliked by people. According to table 2, only
respondents who were not happy at school were more likely to have anorexia. The other variables were not significantly associated with anorexia status.

The final hypothesis was that poor mental health, that is feeling depressed, is related to a higher risk of anorexia. Table 1 shows that a higher percentage of anorexics felt depressed compared to non-anorexics. When other factors are taken into account in table 2, however, there are no significant results regarding the relationship between depression and anorexia.

Moreover, other variables were also associated with a higher risk of anorexia. Females were found to be much more likely to develop anorexia than males, and respondents who believed they were in poor health were also more likely to be anorexic. In addition, those who took diet pills within the past week were more likely to have anorexia.

**Limitations**

This study has a few limitations that may affect the results. For one, because this study is a cross-sectional research design, no causal inferences can be made from the results. Consequently, the risk factors that are found to be associated with having an eating disorder cannot be considered as factors that may cause an eating disorder. In other words, these factors may have occurred before or after the onset of an eating disorder. Thus, only associations can be discussed, but no causal explanations can be given.

Also, the number of respondents in Wave I is different from the number of respondents in Wave III. In Wave I, about 90,000 adolescents were surveyed, whereas in Wave III, only about 15,170 were surveyed. Therefore it was not possible to include the full Wave I sample in the analyses.
Another limitation to the study is that other plausible explanations that were not included in the studied risk factors may play a role in explaining why the respondents who were studied have an eating disorder. For example, the respondents with eating disorders may have been more exposed to the media and felt more pressure to be thin than those without eating disorders. The dataset does not contain information regarding these factors and therefore they cannot be studied.

**Contribution and Policy Implications**

This study adds to what is already known because anorexia seems to be more prevalent than known, mainly because anorexics are unlikely to disclose their problems to anyone. With knowledge about the risk factors that this study found to be associated with a higher risk of having anorexia, policymakers, counselors, teachers, parents, and others who work with adolescents will be better able to detect when an adolescent has an eating disorder, and intervene with the person’s problem before it becomes detrimental to the person’s health.

More research on anorexia is needed. One promising development is passage of the Federal Response to Eliminate Eating Disorders (FREED). This bill created the Centers for Excellence, which was intended to promote research since little is known about eating disorders, develop better training for health and school officials to help them recognize and deal with eating disorders correctly, and require insurance companies to reimburse for eating disorders in the same way as any physical disorder (Eating Disorders Coalition for Research, Policy and Action, 2008).

There are several implications of the study regarding policy. For one, because eating disorders are more prevalent among Caucasian adolescents with mothers of higher education
level, which in turn relates to higher socioeconomic status, policymakers can implement eating disorder prevention and treatment programs targeting adolescents who attend schools in higher-income communities whose population is composed of a majority of Caucasians. Because adolescents with an eating disorder are more likely to be unhappy, new policies and programs can be implemented to improve the emotional health of students and warn them of the effects of an eating disorder. This information can be included in public school curricula to spread awareness.
Figure 1: Conceptual Framework

Demographic Factors
- Race/Ethnicity
- Mom’s Education
- Age
- Gender
- Family Stability

Other factors:
- Physical health (BMI, fitness, etc.)
- Family history and sexual abuse
- School/Workplace environment (social and media pressures, etc.)

Eating Disorders

Relationships
- Friend relationships
- Fit in
- Feel Accepted/Liked
- Parent/Family relationships
- Romantic relationships

Emotional Health
- Depression
- Anxiety Disorders
- Obsessive Compulsive Disorder
References


**Education**

The Pennsylvania State University  
Schreyer Honors College  
Bachelor of Science in Health Policy and Administration  
GPA – 3.94/4.00  

**Honors**

Dean’s List – 7 semesters

**Experience**

Penn State Brain Development Lab  
*Research Assistant*  
University Park, PA  
6/08 – 5/10  
• Apply electrodes to participants’ heads  
• Run visual studies on participants and collect data  
• Maintain laboratory

Nittany Notes  
*Notetaker*  
State College, PA  
8/09 – 5/10  
• Create notes for Anatomy  
• Created notes for Organic Chemistry II  
• Created practice exams for each class

Windber Research Institute  
*Intern*  
Windber, PA  
5/09 - 6/09  
• Conducted public health grant research  
• Found government grant opportunities for the institute  
• Researched public health field

Study Abroad Program in Sevilla, Spain  
Summer 2009

**Leadership**

South Asian Student Association  
*Secretary*  
State College, PA  
09-10  
*Programming Chair*  
08-09

**Volunteering**

Memorial Medical Center  
Johnstown, PA  
• Received Volunteer Service Award for serving >100 hours (135 hours)  
• Delivered EKGs to corresponding floors  
• Filed EKGs

Penn State Dance Marathon (THON)  
State College, PA  
07 - Present  
• Raised thousands of dollars  
• Canning (standing outside businesses asking for donations)  
• Sent THONvelopes (letters to potential donors)

**Activities**

Liaison, Dandia on Fire Indian Dance Competition at Penn State  
*Member*, Indian Fusion Dance Team

**References**

Available upon request